



Junos[®] OS

Getting Started Guide for Routing Devices



Modified: 2018-06-13

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

Juniper Networks, the Juniper Networks logo, Juniper, and Junos are registered trademarks of Juniper Networks, Inc. and/or its affiliates in the United States and other countries. All other trademarks may be property of their respective owners.

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

Junos® OS Getting Started Guide for Routing Devices
Copyright © 2018 Juniper Networks, Inc. All rights reserved.

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

YEAR 2000 NOTICE

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

END USER LICENSE AGREEMENT

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

Table of Contents

	About the Documentation	xi
	Documentation and Release Notes	xi
	Supported Platforms	xi
	Using the Examples in This Manual	xi
	Merging a Full Example	xii
	Merging a Snippet	xii
	Documentation Conventions	xiii
	Documentation Feedback	xv
	Requesting Technical Support	xv
	Self-Help Online Tools and Resources	xv
	Opening a Case with JTAC	xvi
Chapter 1	Accessing a Junos OS Device	17
	Initial Configuration Overview for Junos OS Devices	17
	Understanding the Console Port	18
	Accessing a Junos OS Device the First Time	19
Chapter 2	Understanding the Junos OS	21
	Understanding Junos OS Infrastructure and Processes	21
	Routing Engine and Packet Forwarding Engine	21
	Junos OS Processes	22
	Understanding Software Infrastructure and Processes on EX Series Switches	24
	Routing Engine and Packet Forwarding Engine	24
	Junos OS Processes	24
Chapter 3	Configuring the Root Password	27
	Understanding the Root Password	27
	Protecting Network Security by Configuring the Root Password	28
	Recovering the Root Password	30
Chapter 4	Configuring the Hostname	33
	Understanding Hostnames	33
	Configuring the Hostname of a Router or Switch by Using a Configuration Group	34

Chapter 5	Configuring DNS	37
	DNS Overview	37
	DNS Components	37
	DNS Server Caching	37
	Reaching a Domain Name System Server	38
	Example: Configuring the TTL Value for DNS Server Caching	40
	Example: Configuring the Unique Identity of a Router for Making it Accessible on the Network	41
Chapter 6	Configuring Management and Loopback Interfaces	45
	Understanding Management Ethernet Interfaces	45
	Management Interface in a Non-Default Instance	47
	Why Use a Non-Default Management Interface	47
	Configuring the mgmt_junos Routing Instance	48
	Determining Static Routes	49
	Enabling the mgmt_junos Routing Instance	50
	Removing the mgmt_junos Routing Instance	51
	Understanding the Loopback Interface	52
	Configuring the Loopback Interface	52
	Configuring the Loopback Interface	53
	Example: Configuring Two Addresses on the Loopback Interface with Host Routes	54
	Example: Configuring Two Addresses on the Loopback Interface with Subnetwork Routes	54
	Example: Configuring an IPv4 and an IPv6 Address on the Loopback Interface with Subnetwork Routes	55
Chapter 7	Configuring User Accounts	57
	Junos OS User Accounts Overview	57
	Configuring Junos OS User Accounts by Using a Configuration Group	59
	Enabling Remote Access	62
Chapter 8	Configuring Backup Routers	65
	Understanding Backup Routers	65
	Configuring a Backup Router	66
	Configuring a Backup Router Running IPv4	67
	Configuring a Backup Router Running IPv6	68
Chapter 9	Configuration Statements	71
	announcement	72
	archival	73
	archive-sites (Configuration File)	74
	autoinstallation	76
	backup-router	77
	cli	77
	fast-synchronize	78
	synchronize	79
	compress-configuration-files (System)	81
	configuration	82
	configuration-servers	83

domain-name	84
domain-search	85
dump-device	86
events	87
host-name	88
inet6-backup-router	89
interfaces	90
load-key-file	91
location (System)	92
login-tip	93
management-instance	94
max-configurations-on-flash	95
message	96
mirror-flash-on-disk	97
name-server	98
non-subscriber-no-reply	99
password (Proxy Systems)	99
pic-console-authentication	100
port (Syslog)	101
port (Proxy Server)	101
ports	102
processes	103
proxy (System)	104
root-authentication	105
root-login	107
saved-core-context	108
saved-core-files	109
server (Proxy)	109
static-host-mapping	110
system	111
transfer-interval (Configuration)	112
transfer-on-commit	113
trusted-key	114
username (System)	114

Part 1

Chapter 10

Administration

File Management Commands	117
file archive	118
file checksum md5	120
file checksum sha1	121
file checksum sha-256	122
file compare	123
file copy	127
file delete	130
file list	131
file rename	133
file show	135

Chapter 11	System Software Administrative Commands	137
	clear system commit	138
	clear system reboot	139
	configure	143
	request system configuration rescue delete	145
	request system configuration rescue save	146
	request system halt	147
	request system license add	153
	request system license delete	155
	request system license save	156
	request system logout	157
	request system partition abort	158
	request system partition hard-disk	160
	request system power-off	163
	request system reboot	168
	request system snapshot	174
	request system software add	183
	request system zeroize	197
Chapter 12	System Software Monitoring Commands	203
	show configuration	204
	show host	207
	show system commit	208
	show system configuration archival	211
	show system configuration rescue	212
	show system information	214
	show system processes	215
	show system queues	244
	show system reboot	252
	show system rollback	256
	show system snapshot	258
	show system software	261
	show system statistics	269
	show system storage	307
	show system switchover	316
	show system uptime	323
	show system virtual-memory	328
	show task	390
	show task io	393
	show task memory	395
	show task replication	399
	show version	401
	start shell	415
	test configuration	417

List of Figures

Chapter 1	Accessing a Junos OS Device	17
	Figure 1: Connecting to the Console Port on a Junos OS Device	18
Chapter 8	Configuring Backup Routers	65
	Figure 2: Backup Router Sample Topology	67

List of Tables

	About the Documentation	xi
	Table 1: Notice Icons	xiii
	Table 2: Text and Syntax Conventions	xiv
Chapter 2	Understanding the Junos OS	21
	Table 3: Junos OS Processes	22
	Table 4: Junos OS Processes	25
Chapter 5	Configuring DNS	37
	Table 5: Values to Use in Example	42
Part 1	Administration	
Chapter 12	System Software Monitoring Commands	203
	Table 6: show system commit Output Fields	209
	Table 7: show system processes Output Fields	223
	Table 8: show system queues Output Fields	246
	Table 9: show system snapshot Output Fields	259
	Table 10: show system storage Output Fields	310
	Table 11: show system switchover Output Fields	318
	Table 12: show system uptime Output Fields	325
	Table 13: show system virtual-memory Output Fields	331
	Table 14: show task Output Fields	391
	Table 15: show task io Output Fields	393
	Table 16: show task memory Output Fields	395
	Table 17: show task replication Output Fields	399

About the Documentation

- Documentation and Release Notes on page xi
- Supported Platforms on page xi
- Using the Examples in This Manual on page xi
- Documentation Conventions on page xiii
- Documentation Feedback on page xv
- Requesting Technical Support on page xv

Documentation and Release Notes

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

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

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

Supported Platforms

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

- ACX Series
- M Series
- MX Series
- T Series
- PTX Series

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming

configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

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

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

Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

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

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

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

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

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

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

Documentation Conventions

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

Table 1: Notice Icons







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

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

Table 2: Text and Syntax Conventions

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

Table 2: Text and Syntax Conventions (continued)

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

Documentation Feedback

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

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

Requesting Technical Support

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

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <https://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: <https://www.juniper.net/customers/support/>
- Search for known bugs: <https://prsearch.juniper.net/>
- Find product documentation: <https://www.juniper.net/documentation/>
- Find solutions and answer questions using our Knowledge Base: <https://kb.juniper.net/>
- Download the latest versions of software and review release notes: <https://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <https://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <https://www.juniper.net/cm/>

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

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 <https://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

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

CHAPTER 1

Accessing a Junos OS Device

- [Initial Configuration Overview for Junos OS Devices on page 17](#)
- [Understanding the Console Port on page 18](#)
- [Accessing a Junos OS Device the First Time on page 19](#)

Initial Configuration Overview for Junos OS Devices

After you install and power on the Junos OS device, you are ready to begin initial configuration. The Junos OS is preinstalled on all devices. The procedures in this guide show you how to connect the router to the network but do not enable it to forward traffic. For complete information about enabling the router to forward traffic, including examples, see the Junos OS configuration guides. For information about how to upgrade or reinstall software, see the *Junos OS Installation and Upgrade Guide*.

Gather the following information before configuring the device:

- Name the device will use on the network.
- Domain name the device will use.
- IP address and prefix length information for the Ethernet interface.
- IP address of a default device.
- IP address of a DNS server
- Password for the root user

You configure the device by issuing Junos OS CLI commands, either on a console device attached to the console port on the Routing Engine or over a Telnet connection to a network connected to the management port on the Routing Engine.



NOTE: Only console access to the device is enabled by default. Use a console port to connect to the device initially.

Related Documentation

- [Junos OS Overview](#)
- [Understanding the Console Port on page 18](#)

- [Accessing a Junos OS Device the First Time on page 19](#)

Understanding the Console Port

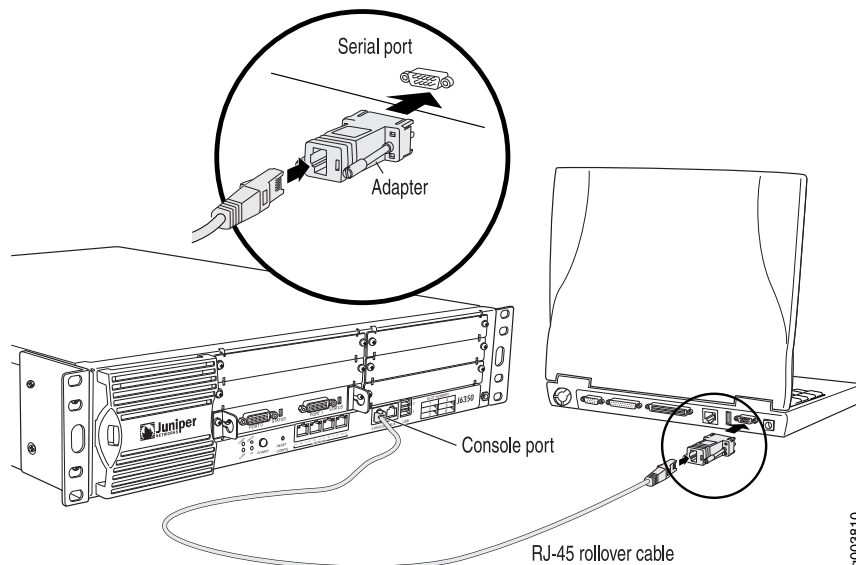
We recommend that you upgrade all individual software packages using an out-of-band connection from the console or management Ethernet interface, because in-band connections can be lost during the upgrade process.

Console ports allow root access to the Junos operating system (Junos OS) devices through a terminal or laptop interface, regardless of the state of the Junos OS device, unless it is completely powered off. By connecting to the console port, you can access the root level of the Junos OS device without using the network to which the device might or might not be connected. This creates a secondary path to the Junos OS device without relying on the network.

Using the terminal interface provides a technician sitting in a Network Operations Center a long distance away the ability to restore a Junos OS device or perform an initialization configuration securely, using a modem, even if the primary network has failed. Without a connection to the console port, a technician would have to visit the site to perform repairs or initialization. A remote connection to the Junos OS device through a modem requires the cable and connector (provided in the device accessory box), plus a DB-9 male to DB-25 male (or similar) adapter for your modem, which you must purchase separately. For more information about connecting to the console port, see the administration guide for your particular router or switch.

To configure the device initially, you must connect a terminal or laptop computer to the device through the console port, as shown in [Figure 1 on page 18](#).

Figure 1: Connecting to the Console Port on a Junos OS Device



- Related Documentation**
- [Initial Configuration Overview for Junos OS Devices on page 17](#)
 - [Accessing a Junos OS Device the First Time on page 19](#)

Accessing a Junos OS Device the First Time

When you power on a Junos OS device the first time, Junos OS automatically boots and starts.

To configure the device initially, you must connect a terminal or laptop computer to the device through the console port—a serial port on the front of the router. Only console access to the device is enabled by default. Remote management access to the router and all management access protocols, including Telnet, FTP, and SSH, are disabled by default.

To access a Junos OS device the first time:

1. Connect a terminal or laptop computer to the Junos OS device through the console port—a serial port on the front of the device.

2. Power on the device and wait for it to boot.

Junos OS boots automatically. The boot process is complete when you see the **login:** prompt on the console.

3. Log in as the user **root**.

Initially, the root user account requires no password. You can see that you are the **root** user, because the prompt on the device shows the username **root@%**.

4. Start the Junos OS command-line interface (CLI).

```
root@% cli
root@>
```

5. Enter Junos OS configuration mode.

```
cli> configure
[edit]
root@#
```

- Related Documentation**
- [Initial Configuration Overview for Junos OS Devices on page 17](#)
 - [Understanding the Root Password on page 27](#)
 - [Protecting Network Security by Configuring the Root Password on page 28](#)
 - [Recovering the Root Password on page 30](#)

CHAPTER 2

Understanding the Junos OS

- [Understanding Junos OS Infrastructure and Processes on page 21](#)
- [Understanding Software Infrastructure and Processes on EX Series Switches on page 24](#)

Understanding Junos OS Infrastructure and Processes

Junos OS includes processes for Internet Protocol (IP) routing and for managing interfaces, networks, and the switch.

Junos OS runs on the Routing Engine. The Routing Engine kernel coordinates communication among the Junos OS processes and provides a link to the Packet Forwarding Engine.

Using the Junos OS command-line interface (CLI), you configure switching features and set the properties of network interfaces. After activating a software configuration, use either the Junos Space or CLI user interface to monitor, manage operations, and diagnose protocol and network connectivity problems.

- [Routing Engine and Packet Forwarding Engine on page 21](#)
- [Junos OS Processes on page 22](#)

Routing Engine and Packet Forwarding Engine

A switch has two primary software processing components:

- Packet Forwarding Engine—Processes packets; applies filters, routing policies, and other features; and forwards packets to the next hop along the route to their final destination.
- Routing Engine—Provides three main functions:
 - Creates the packet forwarding switch, which provides route lookup, filtering, and switching on incoming data packets, and then directs outbound packets to the appropriate interface for transmission to the network.
 - Maintains the routing tables used by the switch and controls the routing protocols that run on the switch.
 - Provides control and monitoring functions for the switch, including controlling power and monitoring system status.

Junos OS Processes

Junos OS running on the Routing Engine and Packet Forwarding Engine consists of multiple processes that are responsible for individual functions.

The separation of functions provides operational stability, because each process accesses its own protected memory space. In addition, because each process is a separate software package, you can selectively upgrade all or part of the Junos OS for added flexibility.

[Table 3 on page 22](#) describes the primary Junos OS processes.

Table 3: Junos OS Processes

Process	Name	Description
Chassis process	chassisd	<p>Detects hardware on the system that is used to configure network interfaces.</p> <p>Monitors the physical status of hardware components and field-replaceable units (FRUs), detecting when environment sensors such as temperature sensors are triggered.</p> <p>Relays signals and interrupts—for example, when devices are taken offline, so that the system can close sessions and shut down gracefully.</p>
DNS server process	named-service	Resolves hostnames into addresses.
Dynamic Host Configuration Protocol (DHCP) process	dhcp-service	Enables a DHCP server to allocate network IP addresses and deliver configuration settings to client hosts without user intervention.
Ethernet switching process	eswd	<p>Handles Layer 2 switching functionality such as MAC address learning, Spanning Tree Protocol, and access port security.</p> <p>Manages Ethernet switching interfaces, VLANs, and VLAN interfaces.</p>
Firewall management process	firewall	Manages the firewall configuration and helps accept or reject packets that are transiting an interface on a switch.
Forwarding process	pfem	Defines how routing protocols operate on the partition. The overall performance of the partition is largely determined by the effectiveness of the forwarding process.
Interface process	dcd	Configures and monitors network interfaces by defining physical characteristics such as link encapsulation, hold times, and keepalive timers.
Integrated Local Management Interface (ILMI) process	ilmi	Provides bidirectional exchange of management information between two ATM interfaces across a physical connection.
Link Management Protocol (LMP) process	link-management	Establishes and maintains LMP control channels.

Table 3: Junos OS Processes (continued)

Process	Name	Description
Management process	mgd	<p>Provides communication between the other processes and an interface to the configuration database.</p> <p>Populates the configuration database with configuration information and retrieves the information when queried by other processes to ensure that the system operates as configured.</p> <p>Interacts with the other processes when commands are issued through one of the user interfaces on the partition.</p> <p>If a process terminates or fails to start when called, the management process attempts to restart it a limited number of times to prevent thrashing and logs any failure information for further investigation.</p>
Multicast snooping process	multicast-snooping	Makes Layer 2 devices, such as VLAN switches, aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.
Secure Neighbor Discovery (SEND) protocol process	send	Protects Neighbor Discovery Protocol (NDP) messages.
Simple Network Management Protocol (SNMP) process	snmp	Enables the monitoring of network devices from a central location and provides the switch's SNMP master agent.
Tunnel OAM process	tunnel-oamd	Enables the Operation, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.
Virtual Router Redundancy Protocol (VRRP) process	vrrp	Enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

Related Documentation

- *Junos OS Baseline Network Operations Guide*
- *Junos OS Administration Library*

Understanding Software Infrastructure and Processes on EX Series Switches

Each switch runs the Juniper Networks Junos operating system (Junos OS) for Juniper Networks EX Series Ethernet Switches on its general-purpose processors. Junos OS includes processes for Internet Protocol (IP) routing and for managing interfaces, networks, and the chassis.

Junos OS runs on the Routing Engine. The Routing Engine kernel coordinates communication among the Junos OS processes and provides a link to the Packet Forwarding Engine.

With the J-Web interface and the command-line interface (CLI) to Junos OS, you configure switching features and routing protocols and set the properties of network interfaces on your switch. After activating a software configuration, use either the J-Web or CLI user interface to monitor the switch, manage operations, and diagnose protocol and network connectivity problems.

- [Routing Engine and Packet Forwarding Engine on page 24](#)
- [Junos OS Processes on page 24](#)

Routing Engine and Packet Forwarding Engine

A switch has two primary software processing components:

- Packet Forwarding Engine—Processes packets; applies filters, routing policies, and other features; and forwards packets to the next hop along the route to their final destination.
- Routing Engine—Provides three main functions:
 - Creates the packet forwarding switch fabric for the switch, providing route lookup, filtering, and switching on incoming data packets, then directing outbound packets to the appropriate interface for transmission to the network
 - Maintains the routing tables used by the switch and controls the routing protocols that run on the switch.
 - Provides control and monitoring functions for the switch, including controlling power and monitoring system status.

Junos OS Processes

The Junos OS running on the Routing Engine and Packet Forwarding Engine consists of multiple processes that are responsible for individual functions.

The separation of functions provides operational stability, because each process accesses its own protected memory space. In addition, because each process is a separate software package, you can selectively upgrade all or part of the Junos OS, for added flexibility.

[Table 3 on page 22](#) describes the primary Junos OS processes.

Table 4: Junos OS Processes

Process	Name	Description
Chassis process	chassisd	<p>Detects hardware on the system that is used to configure network interfaces.</p> <p>Monitors the physical status of hardware components and field-replaceable units (FRUs), detecting when environment sensors such as temperature sensors are triggered.</p> <p>Relays signals and interrupts—for example, when devices are taken offline, so that the system can close sessions and shut down gracefully.</p>
Ethernet switching process	eswd	<p>Handles Layer 2 switching functionality such as MAC address learning, Spanning Tree Protocol and access port security. The process is also responsible for managing Ethernet switching interfaces, VLANs, and VLAN interfaces.</p> <p>Manages Ethernet switching interfaces, VLANs, and VLAN interfaces.</p> <p>NOTE: The process is not applicable for EX2300 and EX3400 switches</p>
Forwarding process	pfem	Defines how routing protocols operate on the switch. The overall performance of the switch is largely determined by the effectiveness of the forwarding process.
Interface process	dcd	Configures and monitors network interfaces by defining physical characteristics such as link encapsulation, hold times, and keepalive timers.
Management process	mgd	<p>Provides communication between the other processes and an interface to the configuration database.</p> <p>Populates the configuration database with configuration information and retrieves the information when queried by other processes to ensure that the system operates as configured.</p> <p>Interacts with the other processes when commands are issued through one of the user interfaces on the switch.</p> <p>If a process terminates or fails to start when called, the management process attempts to restart it a limited number of times to prevent thrashing and logs any failure information for further investigation.</p>
Routing protocol process	rpd	Defines how routing protocols such as RIP, OSPF, and BGP operate on the device, including selecting routes and maintaining forwarding tables.

Related Documentation • *EX Series Ethernet Switches*

CHAPTER 3

Configuring the Root Password

- [Understanding the Root Password on page 27](#)
- [Protecting Network Security by Configuring the Root Password on page 28](#)
- [Recovering the Root Password on page 30](#)

Understanding the Root Password

The root user has complete privileges to operate and configure the Junos OS device, perform upgrades, and manage files in the file system. Initially, the root password is not defined on the Junos OS device. To ensure basic security, you must define the root password during initial configuration. If a root password is not defined, you cannot commit configuration settings on the device.



NOTE: If you use a plain text password, Junos OS displays the password as an encrypted string so that users viewing the configuration cannot see it.

The root password must meet the following conditions:

- Be at least six characters long. Most character classes can be included in a password (alphabetic, numeric, and special characters), except control characters.
- Contain at least one change of case or character class.

Related Documentation

- [Protecting Network Security by Configuring the Root Password on page 28](#)

Protecting Network Security by Configuring the Root Password

Configuring the root password on your Junos OS-enabled router helps prevent unauthorized users from making changes to your network. The root user (also referred to as superuser) has unrestricted access and full permissions within the system, so it is crucial to protect these functions by setting a strong password when setting up a new router.

After a new router is initially powered on, you log in as the user **root** with no password. Junos OS requires configuration of the root password before it accepts a commit operation. On a new device, the root password must always be a part of the configuration submitted with your initial commit.

To set the root password, you have a few options as shown in Step 1 of the following procedure.

- Enter a plain-text password that Junos OS encrypts.
- Enter a password that is already encrypted.
- Enter a secure shell (ssh) public key string.

The most secure options of these three are using an already encrypted password or an ssh public key string. Pre-encrypting your password or using a ssh public key string means the plain-text version of your password will never be transferred over the internet, protecting it from being intercepted by a man-in-the-middle attack.



BEST PRACTICE: Optionally, instead of configuring the root password at the [edit system] hierarchy level, you can use a configuration group to strengthen security, as shown in Step 2 of this procedure. This step uses a group called **global** as an example.

To set the root password:

1. Use one of these methods to configure the root password:

- To enter a plain-text password that the system encrypts for you:

```
[edit groups global system]
root@# set root-authentication plain-text-password
New Password: type password here
Retype new password: retry password here
```

If you use a plain-text password, Junos OS displays the password as an encrypted string so that users viewing the configuration cannot see it. As you enter the password in plain text, Junos OS encrypts it immediately. You do not have to configure Junos OS to encrypt the password as in some other systems. Plain-text passwords are hidden and marked as **## SECRET-DATA** in the configuration.

- To enter a password that is already encrypted:



CAUTION: Do not use the `encrypted-password` option unless the password is *already* encrypted, and you are entering the encrypted version of the password.

If you accidentally configure the `encrypted-password` option with a plain-text password or with blank quotation marks (" "), you will not be able to log in to the device as root, and you will need to complete the root password recovery process.

```
[edit groups global system]
root@# set root-authentication encrypted-password password
```

- To enter an ssh public key string:

```
[edit groups global system]
root@# set root-authentication (ssh-dsa | ssh-eccdsa | ssh-rsa key)
```

2. (Optional) Strengthen security by only allowing root access from the console port.

```
[edit groups global system]
root@# set services ssh root-login deny
```

3. If you used a configuration group in Step 2, apply the configuration group, substituting **global** with the appropriate group name.

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

4. Commit the changes.

```
root@# commit
```

Related Documentation

- [Accessing a Junos OS Device the First Time on page 19](#)
- [Junos OS User Accounts Overview on page 57](#)
- [Recovering the Root Password on page 30](#)

Recovering the Root Password

If you forget the root password for the router, you can use the password recovery procedure to reset the root password.



NOTE: You need console access to recover the root password.



NOTE: This password recovery procedure does not apply to devices running Junos OS with Upgraded FreeBSD. See *Recovering the Root Password on Junos OS with Upgraded FreeBSD*. For MX80 Series routers, try this procedure first, but if it does not work you can manually delete the root-authentication settings from the Junos configuration file and reset the password, as explained here: *Recovering the Root Password for MX80*.



Video: [Recovering the Root Password](#)

To recover the root password:

1. Power off the router by pressing the power button on the front panel.
2. Turn off the power to the management device, such as a PC or laptop computer, that you want to use to access the CLI.
3. Plug one end of the Ethernet rollover cable supplied with the router into the RJ-45-to-DB-9 serial port adapter supplied with the router.
4. Plug the RJ-45-to-DB-9 serial port adapter into the serial port on the management device.
5. Connect the other end of the Ethernet rollover cable to the console port on the router.
6. Turn on the power to the management device.
7. On the management device, start your asynchronous terminal emulation application (such as Microsoft Windows Hyperterminal) and select the appropriate COM port to use (for example, COM1).
8. Configure the port settings as follows:
 - Bits per second: 9600
 - Data bits: 8

- Parity: None
- Stop bits: 1
- Flow control: None

9. Power on the router by pressing the power button on the front panel.

Verify that the POWER LED on the front panel turns green.

The terminal emulation screen on your management device displays the router's boot sequence.

10. When the following prompt appears, press the Spacebar to access the router's bootstrap loader command prompt:

Depending on your device hardware, the bootstrap loader might proceed quite quickly at this step without pausing for input. Therefore, you might need to press the spacebar multiple times at the beginning of the boot sequence.

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [kernel] in 9 seconds...

11. At the following prompt, type **boot -s** to start the system in single-user mode.

ok **boot -s**

12. At the following prompt, type **recovery** to start the root password recovery procedure.

Enter full pathname of shell or 'recovery' for root password recovery or RETURN
for /bin/sh: **recovery**

13. Enter configuration mode in the CLI.

14. Set the root password.

```
[edit]
user@host# set system root-authentication plain-text-password
```

When you configure a plain-text password, Junos OS encrypts the password for you.



CAUTION: Do not use the **encrypted-password** option unless the password is *already* encrypted, and you are entering the encrypted version of the password. If you commit the **encrypted-password** option with a plain-text password or with blank quotation marks (" "), you will not be able to log in to the device as root, and you will need to repeat this password recovery process.

15. At the following prompt, enter the new root password, for example:

New password: **password**

Retype new password:

16. At the second prompt, reenter the new root password.

17. After you have finished configuring the password, commit the configuration.

```
root@host# commit
commit complete
```

18. Exit configuration mode in the CLI.

19. Exit operational mode in the CLI.

20. At the prompt, type **y** to reboot the router.

```
Reboot the system? [y/n] y
```

**Related
Documentation**

- *Configuring the Root Password*
- *Recovering the Root Password on Junos OS with Upgraded FreeBSD*

CHAPTER 4

Configuring the Hostname

- [Understanding Hostnames on page 33](#)
- [Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 34](#)

Understanding Hostnames

Almost all devices in your network have a hostname.

The hostname is the name that identifies the device on the network and is easier to remember than an IP address. When you first power on a Juniper Networks router, switch, or security device, the default hostname is Amnesiac. The Amnesiac prompt is indicative of a device that is booting from a factory-fresh Junos OS software load, which, by definition, does not have a hostname configured.

Administrators often follow conventions for naming devices. One such convention is to name the device based on its location, for example: germany-berlin-R1. The hostname should be unique within your network infrastructure, but there is no need for the local hostname to be globally unique.

A device's hostname usually has a corresponding entry in the domain name system (DNS) so that administrators can connect to the device using the hostname. The fully qualified domain name (FQDN), which is used in DNS, includes the hostname and the domain name. The hostname and the domain name labels are separated by periods or dots, as follows: *hostname.domain*. For example, if the hostname is germany-berlin-R1 and the domain name is emea, the FQDN is germany-berlin-R1.emea. If the emea domain is registered and can be reached as emea.net on the Internet, the FQDN for the device is germany-berlin-R1.emea.net. The FQDN is globally unique.

In Junos OS, the hostname can contain any combination of alphabetic characters, numbers, dashes, and underscores. No other special characters are allowed.

Although Junos OS allows hostnames to contain up to 255 characters, keep in mind that the total length of the hostname as an FQDN cannot exceed 255 characters (including the delimiting dots), with each domain name label having a maximum length of 63 characters. In any case, an overly long hostname is difficult to type and to remember, so short and meaningful hostnames are a best practice.

- Related Documentation**
- [Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 34](#)

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

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

You can configure the hostname at the **[edit system]** hierarchy level, a procedure shown in [“Example: Configuring the Unique Identity of a Router for Making it Accessible on the Network” on page 41](#). Optionally, instead of configuring the hostname at the **[edit system]** hierarchy level, you can use a configuration group, as shown in this procedure. This is a recommended best practice for configuring the hostname, especially if the device has dual Routing Engines. This procedure uses groups called **re0** and **re1** as an example.



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

To set the hostname using a configuration group:

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

The name value must be less than 256 characters.

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

For example:

```
[edit groups re0 system]
root@# set host-name san-jose-router0

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

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

For example:

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

- 3. Commit the changes.

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

The hostname subsequently appears in the device CLI prompt.

```
san-jose-router0#
```

Release History Table	Release	Description
	13.2R3	Starting with Junos OS Release 13.2R3, if you configure hostnames that are longer than the CLI screen width, regardless of the terminal screen width setting, the commit operation occurs successfully.

- Related Documentation
- [Understanding Hostnames on page 33](#)

CHAPTER 5

Configuring DNS

- [DNS Overview on page 37](#)
- [Reaching a Domain Name System Server on page 38](#)
- [Example: Configuring the TTL Value for DNS Server Caching on page 40](#)
- [Example: Configuring the Unique Identity of a Router for Making it Accessible on the Network on page 41](#)

DNS Overview

A Domain Name System (DNS) is a distributed hierarchical system that converts hostnames to IP addresses. The DNS is divided into sections called zones. Each zone has name servers that respond to the queries belonging to their zones.

This topic includes the following sections:

- [DNS Components on page 37](#)
- [DNS Server Caching on page 37](#)

DNS Components

DNS includes three main components:

- **DNS resolver** — Resides on the client side of the DNS. When a user sends a hostname request, the resolver sends a DNS query request to the name servers to request the hostname's IP address.
- **Name servers** — Processes the DNS query requests received from the DNS resolver and returns the IP address to the resolver.
- **Resource records** — Data elements that define the basic structure and content of the DNS.

DNS Server Caching

DNS name servers are responsible for providing the hostname IP address to users. The TTL field in the resource record defines the period for which DNS query results are cached. When the TTL value expires, the name server sends a fresh DNS query and updates the cache.

- Related Documentation**
- [Example: Configuring the TTL Value for DNS Server Caching on page 40](#)
 - [DNSSEC Overview](#)

Reaching a Domain Name System Server

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

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

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

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

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

1. Reference the IP addresses of your DNS servers.

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

The following example shows how to reference two DNS servers:

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

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

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

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

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

The following example shows how to configure the domain name:

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

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

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

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

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

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

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

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

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

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

5. Commit the configuration.

```
user@host# commit
```

6. Verify the configuration.

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

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

For example:

```
user@host> show host device.example.net
device.example.net
device.example.net has address 192.168.187.1

user@host> show host 192.168.187.1
10.187.168.192.in-addr.arpa domain name pointer device.example.net.
```

Related Documentation

- [DNS Overview on page 37](#)

Example: Configuring the TTL Value for DNS Server Caching

This example shows how to configure the TTL value for a DNS server cache to define the period for which DNS query results are cached.

- [Requirements on page 40](#)
- [Overview on page 40](#)
- [Configuration on page 40](#)
- [Verification on page 41](#)

Requirements

No special configuration beyond device initialization is required before performing this task.

Overview

The DNS name server stores DNS query responses in its cache for the TTL period specified in the TTL field of the resource record. When the TTL value expires, the name server sends a fresh DNS query and updates the cache. You can configure the TTL value from 0 to 604,800 seconds. You can also configure the TTL value for cached negative responses. Negative caching is the storing of the record that a value does not exist. In this example, you set the maximum TTL value for cached (and negative cached) responses to 86,400 seconds.

Configuration

Step-by-Step Procedure

To configure the TTL value for a DNS server cache:

1. Specify the maximum TTL value for cached responses, in seconds.

[edit]
user@host# **set system services dns max-cache-ttl 86400**
2. Specify the maximum TTL value for negative cached responses, in seconds.

[edit]
user@host# **set system services dns max-ncache-ttl 86400**

3. If you are done configuring the device, commit the configuration.

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

Verification

To verify the configuration is working properly, enter the **show system services** command.

Related Documentation

- [DNS Overview on page 37](#)

Example: Configuring the Unique Identity of a Router for Making it Accessible on the Network

To use a router in a network, you must configure the router's identity. Configuring a router's identity makes the router accessible on the network and so that other users can log in to it. You can refer to any Internet-connected machine in either of two ways:

- By its IP address
- By its hostname

Once you have a hostname, you can find the IP address, you can use the Domain Name System (DNS) to resolve an IP address from a hostname, or you can manually map the hostname to a static IP address. Although using the DNS is an easier and more scalable way to resolve IP addresses from hostnames, you might not have a DNS entry for the router, or you might not want the computer to contact the DNS server to resolve a particular IP address (perhaps you use this particular IP address a lot, or you might be using it only for testing or development purposes and do not want to give it a DNS entry).

To configure a router's unique identity, you might need to include all or part of the following: the hostname of the router, its IP address, the domain name, two or three name servers, mapping of the hostname to the IP address.

- [Requirements on page 41](#)
- [Overview on page 41](#)
- [Configuration on page 42](#)
- [Verification on page 43](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

A hostname is the router's name. It is easier for most people to remember a hostname than an IP address. Junos OS uses the configured hostname as part of the command prompt, to prepend log files and other accounting information, as well as in other places

where knowing the device identity is useful. You can use the hostname to telnet to a router.

The domain name is the string appended to hostnames that are not fully qualified. The domain name is the name of a network associated with an organization. For sites in the United States, domain names typically take the form of *org-name.org-type*.

The mapping of hostnames to IP addresses is handled through a service called the Domain Name System (DNS). A series of special DNS servers across the world known as name servers keep track of the hostname and IP address information for all the devices on the Internet. Applications that need to determine an IP address from a hostname (or vice versa) contact the local name server to get this information. You can set a few name servers.

In case your hostname and IP address do not have a DNS entry in a name server, configure a static mapping.

In this example, the values given in [Table 5 on page 42](#) are used to configure each of these variables. You need to substitute data pertinent to your router and network for these values.

Table 5: Values to Use in Example

Name of Variable	Value Used in Example	Value You Substitute
domain-name <i>domain-name</i>	domain-name device.example.net	
host-name <i>host-name</i>	host-name example-re0	
inet <i>ip-address</i>	inet 172.22.147.39	
name-server <i>ip-address</i>	name-server 172.24.16.115	
	name-server 192.0.2.0	

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands and paste them in a text file, remove any line breaks, change the values used to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set system domain-name device.example.net
set system host-name example-re0
set system name-server 172.24.16.115
set system name-server 192.0.2.0
set system static-host-mapping example-re0 inet 172.22.147.39
```

Configuring the Router's Identity

Step-by-Step Procedure

To configure the identity settings of a device:

1. Configure the domain name of your network.

```
[edit]
user@host# set system domain-name device.example.net
```
2. Configure the hostname, using the **set system host-name** command.

```
[edit]
user@host# set system host-name example-re0
```
3. Configure from one to three name servers.

```
[edit]
user@host# set system name-server 172.24.16.115
user@host# set system name-server 192.0.2.0
```
4. Map from the hostname to the IP address, using the **set system static-host-mapping** command.

```
[edit]
user@host# set system static-host-mapping example-re0 inet 172.22.147.39
```

Results

To check the configuration, use the configuration mode **show system** command.

```
[edit]
user@host# show system
domain-name device.example.net;
host-name example-re0;
name-server {
  172.24.16.115;
  192.0.2.0;
}
static-host-mapping {
  example-re0 {
    inet 172.22.147.39;
  }
}
```

When you have the correct configuration, enter **commit**.

Verification

Verifying the Hostname and IP Address of a Device

Purpose Verify the hostname and IP address of a device.

Action Issue the `show host host-name` operational command.

```
user@example-re0> show host newton
newton.device.example.net is an alias for example-re0.device.example.net.
example-re0.device.example.net has address 172.22.147.39
```

- Related Documentation**
- [Understanding Hostnames on page 33](#)
 - [Reaching a Domain Name System Server on page 38](#)

CHAPTER 6

Configuring Management and Loopback Interfaces

- [Understanding Management Ethernet Interfaces on page 45](#)
- [Management Interface in a Non-Default Instance on page 47](#)
- [Understanding the Loopback Interface on page 52](#)
- [Configuring the Loopback Interface on page 52](#)

Understanding Management Ethernet Interfaces

Management interfaces are the primary interfaces for accessing the device remotely. Typically, a management interface is not connected to the in-band network, but is connected instead to the device's internal network. Through a management interface you can access the device over the network using utilities such as **ssh** and **telnet** and configure the device from anywhere, regardless of its physical location. SNMP can use the management interface to gather statistics from the device.

A management interface lets authorized users and management systems connect to the device over the network. Some Juniper Networks devices have a dedicated management port on the front panel. For other types of platforms, you can configure a management interface on one of the network interfaces. This interface can be dedicated to management or shared with other traffic. Before users can access the management interface, you must configure it. Information required to set up the management interface includes its IP address and prefix. In many types of Junos OS devices (or recommended configurations), it is not possible to route traffic between the management interface and the other ports. Therefore, you should select an IP address in a separate (logical) network, with a separate prefix (netmask).

For devices with dedicated management ports, Junos OS automatically configures the router's management Ethernet interface, as either **em0** or **fxp0**. You can use the **show interfaces terse | match fxp0** or **show interfaces terse | match em0** command to display management interface information.

To use the management Ethernet interface as a management port, you must configure its logical port, **em0.0** or **fxp0.0**, with a valid IP address.

For some SRX Series Services Gateways and J Series Services Routers, you can use any of the built-in Ethernet ports as a management interface. (Platform support depends

on the Junos OS release in your installation.) To use a built-in interface as a management Ethernet interface, configure it with a valid IP address. To manually configure J-Web access, include the **interface *interface-name*** statement at the **[edit system services web-management http]** hierarchy level.

For PTX Series Packet Transport Routers, the Junos OS automatically creates the router's management Ethernet interface, **em0**. To use **em0** as an out-of-band management port, you must configure its logical port (for example, **em0.0**) with a valid IP address.

Internal Ethernet interfaces are automatically created to connect the Routing Engines to the Packet Forwarding Engines in the FPCs.

When you enter the **show interfaces** command on a PTX Series Packet Transport Router, the management Ethernet interface and internal Ethernet interfaces (and logical interfaces) are displayed:

```
user@host> show interfaces ?
...
em0
  em0.0
  ixgbe0
  ixgbe0.0
  ixgbe1
  ixgbe1.0
...
```



NOTE: *Routing Engine upgrade considerations*—When upgrading to a Routing Engine that supports em0 from a Routing Engine that supports fxp0, you must convert existing management Ethernet interface references in the router configuration files from fxp0, fxp1, or fxp2 interfaces to em0 interfaces. Whether you use an automated script or edit the configuration files manually, you must revise any command lines that reference the fxp0 management Ethernet interface by replacing “fxp0” with “em0.”

Reusing scripts for standalone T1600 routers on T1600 routers in a routing matrix—Automated scripts that you have developed for standalone T1600 routers (T1600 routers that are not in a routing matrix) might contain references to the fxp0 management Ethernet interface. Before reusing the scripts on T1600 routers in a routing matrix, edit the command lines that reference the fxp0 management Ethernet interface so that the commands reference the em0 management Ethernet interface instead.

Restricted load-sharing next hops with fxp0—On M Series Multiservices Edge Routers and T Series Core Routers running Junos OS later than Release 7.0R2.7 or Release 7.1R2.2, the fxp0 interface does not support load-sharing next hops. This restriction only affects fxp0 routes.

CoS not supported on fxp0—The fxp0 interface does not support class of service (CoS).

The Routing Engines in the PTX Series Packet Transport Routers do not support the management Ethernet interface fxp0, or the internal Ethernet interfaces fxp1 or fxp2.

Related Documentation • [Supported Routing Engines by Router](#)

Management Interface in a Non-Default Instance

- [Why Use a Non-Default Management Interface on page 47](#)
- [Configuring the mgmt_junos Routing Instance on page 48](#)

Why Use a Non-Default Management Interface

By default, in Junos OS, the management Ethernet interface (usually named fxp0 or em0) provides the out-of-band management network for the device. There is no clear separation between either out-of-band management traffic and in-band protocol control traffic, or user traffic at the routing-instance or routing-table level. Instead, all traffic is handled through the default routing instance, giving rise to concerns over security, performance, and how to troubleshoot.

Starting with Junos OS Release 17.3R1, you can confine the management interface in a non-default virtual routing and forwarding (VRF) instance, the mgmt_junos routing instance. Once you configure this management routing instance as described in

[“Configuring the mgmt_junos Routing Instance” on page 48](#), management traffic no longer has to share a routing table (that is, the default.inet.0 table) with other control or protocol traffic in the system. However, for the feature to work for all processes that communicate through the management interface, these daemons must have support for a management VRF. In many cases, the new configuration to make these systems work with the non-default VRF instance is to add the name of this new management routing instance (mgmt_junos) to these features.

The following features share use of the non-default management VRF instance:

- **Automation scripts**—Starting in Junos OS Release 18.1R1, configuration of commit, event, JET, op, and SNMP scripts is upgraded to support the non-default management routing instance **mgmt_junos** as an option when specifying the source URL for refreshing or downloading Automation scripts. You can also specify some other routing instance (not a management instance) for refreshing or downloading Automation scripts. See *Using an Alternate Source Location for a Script* or *Configuring and Using a Master Source Location for a Script*.
- **RADIUS**—Starting in Junos OS 18.1R1, existing RADIUS support is enhanced to support a management interface in a non-default VRF instance. For more information on RADIUS, see *Configuring RADIUS Server Authentication* and *Configuring RADIUS System Accounting*.
- **NTP**—Starting in Junos OS 18.1R1, NTP clients can support the non-default management routing instance **mgmt_junos** when specifying the routing instance that is used to reach a server for NTP time synchronization. For more information on NTP, see *Configuring the NTP Time Server and Time Services*.
- **syslog**—In Junos OS 17.3R1, the syslog/event daemon was able to handle the dedicated management routing instance for IPv4 addressed remote host. As of Junos 18.1R1, the syslog/event daemon supports IPv6-based configuration when connecting to a remote host or an archival site, when fxp0 is moved to the dedicated management instance mgmt_junos. Statements at the **[edit system syslog]** hierarchy level support IPv6 addresses, too. See *syslog (System)*.
- **TACACS+**—Starting in Junos OS Release 17.4R1, existing TACACS+ behavior is enhanced to support a management interface in a non-default VRF instance. For more information on TACACS+, see *Configuring TACACS+ Authentication* and *Configuring TACACS+ System Accounting*.

Configuring the mgmt_junos Routing Instance

Starting in Junos OS 17.3R1, you can confine the management interface in a dedicated management instance by configuring the **management-instance** configuration statement at the **[edit system]** hierarchy level. The name of the dedicated management instance is reserved and hardcoded as **mgmt_junos**; you are prevented from configuring any other routing instance by the name **mgmt_junos**. Once the mgmt_junos routing instance is deployed, management traffic no longer shares a routing table (that is, the default.inet.0 table) with other control or protocol traffic in the system, nor is configuring dynamic protocols on the management interface supported.

Because there are FreeBSD and Junos OS applications that assume that the management interface is always present in the default.inet.0 routing table, the `mgmt_junos` routing instance is not instantiated by default.

As part of configuring the `mgmt_junos` routing instance, you must also move static routes that have a next hop over the default management interface to the `mgmt_junos` routing instance. If needed, you must also configure the appropriate daemons or applications to use the `mgmt_junos` routing instance. All of these changes must be done in a single commit. Otherwise, the transition to `mgmt_junos` will not be smooth and you will have to repair the system later by logging in from the console.

After you commit the configuration, expect to lose, and then have to reestablish, the Telnet session.

For an example of using this feature, see the following sections:

- [Determining Static Routes on page 49](#)
- [Enabling the `mgmt_junos` Routing Instance on page 50](#)
- [Removing the `mgmt_junos` Routing Instance on page 51](#)

Determining Static Routes

As part of configuring the `mgmt_junos` routing instance, you must move all the static routes that have a next hop through the `fxp0` interface from the default routing instance to `mgmt_junos`. The following commands are useful to determine static routes that need to be changed.

- Use the `show interfaces fxp0 terse` command to find the IP address of the `fxp0` interface:

```
user@host> show interfaces fxp0 terse
Interface           Admin Link Proto  Local              Remote
fxp0                up    up
fxp0.0              up    up   inet    10.102.183.152/20
```

- Use the `show route forwarding-table` command to look at the forwarding table for next-hop information for static routes (static routes show up as type `user`):

```
user@host> show route forwarding-table

Routing table: default.inet
Internet:
Enabled protocols: Bridging,
Destination      Type RtRef Next hop          Type Index  NhRef Netif
default          perm  0
0.0.0.0/32       perm  0
10.0.0.0/8       user  0 0:0:5e:0:1:d0    ucst   341     6 fxp0.0
10.0.1.0/24      intf  0
10.0.1.0/32      dest  0 10.0.1.0          recv   582     1 ge-0/0/0.0
10.0.1.1/32      intf  0 10.0.1.1          locl   583     2
10.0.1.1/32      dest  0 10.0.1.1          locl   583     2
10.0.1.255/32    dest  0 10.0.1.255        bcst   581     1 ge-0/0/0.0
10.102.176.0/20  intf  0
10.102.176.0/32  dest  0 10.102.176.0      recv   338     1 fxp0.0
10.102.176.3/32  dest  1 0:50:56:9f:1b:2e  ucst   350     2 fxp0.0
10.102.183.152/32 intf  0 10.102.183.152    locl   339     2
```

10.102.183.152/32	dest	0	10.102.183.152	loc1	339	2
10.102.191.253/32	dest	0	10:e:7e:b1:b0:80	ucst	348	1 fxp0.0
10.102.191.254/32	dest	0	0:0:5e:0:1:d0	ucst	341	6 fxp0.0
10.102.191.255/32	dest	0	10.102.191.255	bcst	337	1 fxp0.0
172.16.0.0/12	user	0	10.102.191.254	ucst	341	6 fxp0.0
192.168.0.0/16	user	0	10.102.191.254	ucst	341	6 fxp0.0
224.0.0.0/4	perm	0		mdsc	35	1
224.0.0.1/32	perm	0	224.0.0.1	mcst	31	1
255.255.255.255/32	perm	0		bcst	32	1

- Another way to find your static routes is to use the **show route protocol static** command.

```

user@host> show route protocol static
inet.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.0/8          *[Static/5] 2d 21:48:36
                    > to 10.102.191.254 via fxp0.0
172.16.0.0/12       *[Static/5] 2d 21:48:36
                    > to 10.102.191.254 via fxp0.0
192.168.0.0/16      *[Static/5] 2d 21:48:36
                    > to 10.102.191.254 via fxp0.0

```

Each setup is different. What you are identifying are the static routes that have a next hop through the fxp0 interface. The next hop for any static route that is affected will have an IP address that falls under the subnet of the IP address configured for fxp0.

Enabling the mgmt_junos Routing Instance

To enable the mgmt_junos routing instance:

1. Configure the **management-instance** statement.

```

[edit]
user@host# set system management-instance

```

2. Move the appropriate static routes to the mgmt_junos routing instance.

For a discussion of determining static routes to change, see [“Determining Static Routes” on page 49](#).

```

[edit routing-instances mgmt_junos routing-option static route]
user@host# set 10.0.0.0/8 next-hop 10.102.191.254
user@host# set 172.16.0.0/12 next-hop 10.102.191.254
user@host# set 192.168.0.0/16 next-hop 10.102.191.254

```

If you are using configuration groups you might want to set these changes as part of a group:

```

[edit groups global routing-instances mgmt_junos routing-options static route ]
user@host# set 10.0.0.0/8 next-hop 10.102.191.254
user@host# set 172.16.0.0/12 next-hop 10.102.191.254
user@host# set 192.168.0.0/16 next-hop 10.102.191.254

```

3. Commit the configuration.

Expect to lose the Telnet connection at commit.

4. Reestablish the Telnet connection.

At this point you have configured the **management-instance** statement. Tables for the `mgmt_junos` table are set up for `inet` and `inet6` and marked as private tables. The management interface is moved to the `mgmt_junos` routing table. Static routes with a next hop to the management interface are moved from the default routing table and added to the `mgmt_junos` routing instance.

However, if you have not configured the **management routing-instance** option in the **tacplus server** statement, the TACACS+ packets continue to be sent using the default routing instance only.

Removing the `mgmt_junos` Routing Instance

When you remove the `mgmt_junos` routing instance you must also move the static routes back to the default routing instance and delete the TACACS+ settings for `mgmt_junos`.

To remove the dedicated management interface:

1. Delete or deactivate the management routing-instance statement.

```
user@host# [edit]
user@host# delete system management-instance
```

2. Move the static routes back to the default routing instance.

```
[edit routing-instances mgmt_junos routing-options static route ]
user@host# delete 10.0.0.0/8 next-hop 10.102.191.254
user@host# delete 172.16.0.0/12 next-hop 10.102.191.254
user@host# delete 192.168.0.0/16 next-hop 10.102.191.254
```

Release History Table

Release	Description
17.4R1	Starting in Junos OS Release 17.4R1, existing TACACS+ behavior is enhanced to support a management interface in a non-default VRF instance.
17.3R1	Starting with Junos OS Release 17.3R1, you can confine the management interface in a non-default virtual routing and forwarding (VRF) instance, the <code>mgmt_junos</code> routing instance.

- Related Documentation**
- [routing-instance](#)
 - [management-instance on page 94](#)

Understanding the Loopback Interface

The loopback address (**lo0**) has several uses, depending on the particular Junos feature being configured. It can perform the following functions:

- **Device identification**—The loopback interface is used to identify the device. While any interface address can be used to determine if the device is online, the loopback address is the preferred method. Whereas interfaces might be removed or addresses changed based on network topology changes, the loopback address never changes.

When you ping an individual interface address, the results do not always indicate the health of the device. For example, a subnet mismatch in the configuration of two endpoints on a point-to-point link makes the link appear to be inoperable. Pinging the interface to determine whether the device is online provides a misleading result. An interface might be unavailable because of a problem unrelated to the device's configuration or operation.

- **Routing information**—The loopback address is used by protocols such as OSPF to determine protocol-specific properties for the device or network. Further, some commands such as **ping mpls** require a loopback address to function correctly.
- **Packet filtering**—Stateless firewall filters can be applied to the loopback address to filter packets originating from, or destined for, the Routing Engine.

The Internet Protocol (IP) specifies a loopback network with the (IPv4) address **127.0.0.0/8**. Most IP implementations support a loopback interface (**lo0**) to represent the loopback facility. Any traffic that a computer program sends on the loopback network is addressed to the same computer. The most commonly used IP address on the loopback network is **127.0.0.1** for IPv4 and **::1** for IPv6. The standard domain name for the address is **localhost**.

The device also includes an internal loopback address (**lo0.16384**). The internal loopback address is a particular instance of the loopback address with the logical unit number 16384. Junos OS creates the loopback interface for the internal routing instance. This interface prevents any filter on **lo0.0** from disrupting internal traffic.

- Related Documentation**
- [Configuring a Loopback Interface](#)
 - [Understanding Interfaces](#)
 - [Understanding Management Interfaces](#)
 - [Understanding the Discard Interface](#)

Configuring the Loopback Interface

- [Configuring the Loopback Interface on page 53](#)
- [Example: Configuring Two Addresses on the Loopback Interface with Host Routes on page 54](#)

- [Example: Configuring Two Addresses on the Loopback Interface with Subnetwork Routes on page 54](#)
- [Example: Configuring an IPv4 and an IPv6 Address on the Loopback Interface with Subnetwork Routes on page 55](#)

Configuring the Loopback Interface

When specifying the loopback address, do not include a destination prefix. Also, in most cases, do not specify a loopback address on any unit other than unit 0.



NOTE: For Layer 3 virtual private networks (VPNs), you can configure multiple logical units for the loopback interface. This allows you to configure a logical loopback interface for each virtual routing and forwarding (VRF) routing instance. For more information, see the *Junos OS VPNs Library for Routing Devices*.

For some applications, such as SSL for Junos XML protocol, the address for the interface `lo0.0` must be `127.0.0.1`.

You can configure loopback interfaces using a subnetwork address for both `inet` and `inet6` address families. Many protocols require a subnetwork address as their source address. Configuring a subnetwork loopback address as a donor interface enables these protocols to run on unnumbered interfaces.

If you configure the loopback interface, it is automatically used for unnumbered interfaces. If you do not configure the loopback interface, the router chooses the first interface to come online as the default. If you configure more than one address on the loopback interface, we recommend that you configure one to be the primary address to ensure that it is selected for use with unnumbered interfaces. By default, the primary address is used as the source address when packets originate from the interface.

For more information about unnumbered interfaces, see *Configuring an Unnumbered Interface*. For more information about primary addresses, see *Configuring the Interface Address*.

On the router, you can configure one physical loopback interface, `lo0`, and one or more addresses on the interface.

1. To configure the physical loopback interface, include the following statements at the **[edit interfaces]** hierarchy level:

```
[edit interfaces]
lo0 {
  unit 0 {
    family inet {
      address loopback-address;
      address <loopback-address2>;
      ...
    }
    family inet6 {
      address loopback-address;
```

```
    }  
  }  
}
```

Example: Configuring Two Addresses on the Loopback Interface with Host Routes

To configure two addresses on the loopback interface with host routes:

```
[edit]  
user@host# edit interfaces lo0 unit 0 family inet  
[edit interfaces lo0 unit 0 family inet]  
user@host# set address 172.16.0.1  
[edit interfaces lo0 unit 0 family inet]  
user@host# set address 10.0.0.1  
[edit interfaces lo0 unit 0 family inet]  
user@host# top  
[edit]  
user@host# show  
interfaces {  
  lo0 {  
    unit 0 {  
      family inet {  
        10.0.0.1;  
        127.0.0.1;  
        172.16.0.1;  
      }  
    }  
  }  
}
```

Example: Configuring Two Addresses on the Loopback Interface with Subnetwork Routes

To configure two addresses on the loopback interface with subnetwork routes:

```
[edit]  
user@host# edit interfaces lo0 unit 0 family inet  
[edit interfaces lo0 unit 0 family inet]  
user@host# set address 192.16.0.1/24  
[edit interfaces lo0 unit 0 family inet]  
user@host# set address 10.2.0.1/16  
[edit interfaces lo0 unit 0 family inet]  
user@host# top  
[edit]  
user@host# show  
interfaces {  
  lo0 {  
    unit 0 {  
      family inet {  
        10.2.0.1/16;  
        127.0.0.1/32;  
        192.16.0.1/24;  
      }  
    }  
  }  
}
```

Example: Configuring an IPv4 and an IPv6 Address on the Loopback Interface with Subnetwork Routes

To configure an IPv4 and an IPv6 address on the loopback interface with subnetwork routes:

```
[edit]
user@host# edit interfaces lo0 unit 0 family inet
[edit interfaces lo0 unit 0 family inet]
user@host# set address 192.16.0.1/24
[edit interfaces lo0 unit 0 family inet]
user@host# up
[edit interfaces lo0 unit 0 family]
user@host# edit interfaces lo0 unit 0 family inet6
[edit interfaces lo0 unit 0 family inet6]
user@host# set address 3ffe::1:200:f8ff:fe75:50df/64
[edit interfaces lo0 unit 0 family inet6]
user@host# top
[edit]
user@host# show
interfaces {
  lo0 {
    unit 0 {
      family inet {
        127.0.0.1/32;
        192.16.0.1/24;
      }
      family inet6 {
        3ffe::1:200:f8ff:fe75:50df/64;
      }
    }
  }
}
```

- Related Documentation**
- *Junos OS VPNs Library for Routing Devices*
 - *Configuring an Unnumbered Interface*
 - *Configuring the Interface Address*

CHAPTER 7

Configuring User Accounts

- [Junos OS User Accounts Overview on page 57](#)
- [Configuring Junos OS User Accounts by Using a Configuration Group on page 59](#)
- [Enabling Remote Access on page 62](#)

Junos OS User Accounts Overview

User accounts provide one way for users to access the device. (Users can access the device without accounts if you configured RADIUS or TACACS+ servers, as described in *Junos OS User Authentication Methods*.) For each account, you define the login name for the user and, optionally, information that identifies the user. After you have created an account, the software creates a home directory for the user.

For each user account, you can define the following:

- Username—Name that identifies the user. It must be unique within the device. Do not include spaces, colons, or commas in the username. The username can be up to 64 characters long.
- User's full name—(Optional) If the full name contains spaces, enclose it in quotation marks. Do not include colons or commas.
- User identifier (UID)—(Optional) Numeric identifier that is associated with the user account name. The identifier must be in the range from 100 through 64,000 and must be unique within the device. If you do not assign a UID to a username, the software assigns one when you commit the configuration, preferring the lowest available number.

You must ensure that the UID is unique. However, it is possible to assign the same UID to different users. If you do this, the CLI displays a warning when you commit the configuration and then assigns the duplicate UID.

- User's access privilege—(Required) One of the login classes you defined in the **class** statement at the **[edit system login]** hierarchy level, or one of the default classes listed in *No title found in topic database*.
- Authentication method or methods and passwords that the user can use to access the device—(Optional) You can use SSH or a Message Digest 5 (MD5) password, or you can enter a plain-text password that the Junos OS encrypts using MD5-style encryption before entering it in the password database. For each method, you can

specify the user's password. If you configure the **plain-text-password** option, you are prompted to enter and confirm the password:

```
[edit system login user username]
user@host# set authentication plain-text-password
New password: type password here
Retype new password: retype password here
```

The default requirements for plain-text passwords are:

- The password must be between 6 and 128 characters long.
- You can include most character classes in a password (uppercase letters, lowercase letters, numbers, punctuation marks, and other special characters). Control characters are not recommended.
- Valid passwords must contain at least one change of case or character class.

Junos-FIPS and Common Criteria have special password requirements. FIPS and Common Criteria passwords must be between 10 and 20 characters in length. Passwords must use at least three of the five defined character sets (uppercase letters, lowercase letters, digits, punctuation marks, and other special characters). If Junos-FIPS is installed on the device, you cannot configure passwords unless they meet this standard.

For SSH authentication, you can copy the contents of an SSH key file into the configuration or directly configure SSH key information. Use the **load-key-file** *URL filename* command to load an SSH key file that was previously generated, e.g. by using **ssh-keygen**. The *URL filename* is the path to the file's location and name. This command loads RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys. The contents of the SSH key file are copied into the configuration immediately after you enter the **load-key-file** statement. Optionally, you can use the **ssh-dsa public key** *<from hostname>* and the **ssh-rsa public key** *<from hostname>* statements to directly configure SSH keys.

For each user account and for root logins, you can configure more than one public RSA or DSA key for user authentication. When a user logs in using a user account or as root, the configured public keys are referenced to determine whether the private key matches any of them.

To view the SSH keys entries, use the configuration mode **show** command. For example:

```
[edit system login user boojum]
user@host# set authentication load-key-file my-host:.ssh/id_dsa.pub
.file.19692 | 0 KB | 0.3 kB/s | ETA: 00:00:00 | 100%
[edit system]
user@host# show
root-authentication {
  ssh-rsa "$ABC123"; # SECRET-DATA
}
```

An account for the user **root** is always present in the configuration. You configure the password for **root** using the **root-authentication** statement, as described in *Configuring the Root Password*.

- Related Documentation**
- [Configuring Junos OS User Accounts by Using a Configuration Group on page 59](#)
 - [Junos OS Login Classes Overview](#)

Configuring Junos OS User Accounts by Using a Configuration Group

User accounts provide a way for users to access a router or switch. Junos OS requires that all users have a predefined user account before they can log in to the device. For each user account, you define the login name for the user and, optionally, information that identifies the user. After you have created an account, the software creates a home directory for the user.

It is a common practice to use remote authentication servers to centrally store information about users. Even so, it is also a good practice to configure at least one nonroot user directly on each device, in case access to the remote authentication server is disrupted. This one nonroot user commonly has a generic name, such as **admin**.

Because user accounts are configured on multiple devices, they are commonly configured inside of a configuration group. As such, the examples shown here are in a configuration group called **global**. Using a configuration group for your user accounts is optional.

To create a user account:

1. Add a new user, using the user's assigned account login name.

```
[edit groups global]
user@host# edit system login user username
```

2. (Optional) Configure a full descriptive name for the account.

If the full name includes spaces, enclose the entire name in quotation marks.

```
[edit groups global system login user user-name]
user@host# set full-name complete-name
```

For example:

```
user@host# show groups
global {
  system {
    login {
      user admin {
        full-name "general administrator";
      }
    }
  }
}
```

3. (Optional) Set the user identifier (UID) for the account.

As with UNIX systems, the UID enforces user permissions and file access. If you do not set the UID, Junos OS assigns one for you. The format of the UID is a number in the range of 100 to 64000.

```
[edit groups global system login user user-name]  
user@host# set uid uid-value
```

For example:

```
user@host# show groups  
global {  
  system {  
    login {  
      user admin {  
        uid 9999;  
      }  
    }  
  }  
}
```

4. Assign the user to a login class.

You can define your own login classes or assign one of the predefined Junos OS login classes.

The predefined login classes are as follows:

- super-user—all permissions
- operator—clear, network, reset, trace, and view permissions
- read-only— view permissions
- unauthorized—no permissions

```
[edit groups global system login user user-name]  
user@host# set class class-name
```

For example:

```
user@host# show groups  
global {  
  system {  
    login {  
      user admin {  
        class super-user;  
      }  
    }  
  }  
}
```

5. Use one of the following methods to configure the user password.

- To enter a clear-text password that the system encrypts for you, use the following command to set the user password:

```
[edit groups global system login user user-name]  
user@host# set authentication plain-text-password password  
New Password: type password here  
Retype new password: retry password here
```

As you enter the password in plain text, Junos OS encrypts it immediately. You do not have to configure Junos OS to encrypt the password as in some other systems. Plain-text passwords are therefore hidden and marked as `## SECRET-DATA` in the configuration.

- To enter a password that is already encrypted, use the following command to set the user password:



CAUTION: Do not use the `encrypted-password` option unless the password is *already* encrypted, and you are entering the encrypted version of the password.

If you accidentally configure the `encrypted-password` option with a plain-text password or with blank quotation marks (`" "`), you will not be able to log in to the device as this user.

```
[edit groups global system login user user-name]
user@host# set authentication encrypted-password "password"
New Password: type password here
Retype new password: retype password here
```

- To load previously generated public keys from a named file at a specified URL location, use the following command to set the user password:

```
[edit groups global system login user user-name]
user@host# set authentication load-key-file URL filename
```

- To enter an ssh public string, use the following command to set the user password:

```
[edit groups global system login user user-name]
user@host# set authentication (ssh-dsa | ssh-eccdsa | ssh-rsa) authorized-key
```

6. At the top level of the configuration, apply the configuration group.

If you use a configuration group, you must apply it for it to take effect.

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

7. Commit the configuration.

```
user@host# commit
```

8. To verify the configuration, log out and log back in as the new user.

Related Documentation

- *Defining Junos OS Login Classes*
- *Example: Creating Login Classes with Specific Privileges*
- [Junos OS User Accounts Overview on page 57](#)
- *Limiting the Number of User Login Attempts for SSH and Telnet Sessions*

Enabling Remote Access

SSH, telnet, and FTP are widely used standards for remotely logging into network devices, and exchanging files between systems. Before authorized users can access your device, or your device can exchange data with other systems, you must configure one or more of these enabling services. They are all disabled by default in Junos OS.

SSH is a protocol that uses strong authentication and encryption for remote access across a nonsecure network. SSH provides remote login, remote program execution, file copy, and other functions. SSH is telnet's successor and is the recommended method for remote access. SSH encrypts all traffic, including passwords, to effectively eliminate eavesdropping, connection hijacking, and other attacks. The SSH utility includes SCP (secure copy), a file transfer program that uses SSH and is the recommended method for secure file exchange.

Because both telnet and FTP are legacy applications that use clear text passwords (therefore creating a potential security vulnerability), we recommend that you use SSH (and SCP). If you do not intend to use FTP or telnet, you do not need to configure them on your device. However, do not forget to consider that some users might use FTP to store configuration templates, retrieve software, or other administrative tasks.

To set up remote access and file transfer services:

1. Enable SSH access.

```
[edit groups global]  
user@host# set system services ssh
```

2. Enable telnet access.

```
[edit groups global]  
user@host# set system services telnet
```

3. Enable FTP.

```
[edit groups global]  
user@host# set system services ftp
```

4. At the top level of the configuration, apply the configuration group.

If you use a configuration group, you must apply it for it to take effect.

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

5. Commit the configuration.

```
user@host# commit
```

Related Documentation

- *Configuring SSH Service for Remote Access to the Router or Switch*
- *Configuring Telnet Service for Remote Access to a Router or Switch*

- *Configuring FTP Service for Remote Access to the Router or Switch*

CHAPTER 8

Configuring Backup Routers

- [Understanding Backup Routers on page 65](#)
- [Configuring a Backup Router on page 66](#)

Understanding Backup Routers

If Junos OS is running on a routing device, you might want to specify a backup router. The purpose of the backup router is not to forward transit traffic. It is for local management of the routing device, by way of the out-of-band management interface (fxp0 or me0, for example). Traffic is not forwarded between the Packet Forwarding Engine and the management interface. You cannot route traffic between the management interface and the physical interfaces in the chassis.

The Junos OS process responsible for establishing routes is known as the routing protocol process (rpd). The backup router allows the routing device to install a route to a management network, before the routing protocol process is up and running. A backup router can be used during the initial boot process of Junos OS, before any routing protocols have converged. It allows the device to establish a Layer 3 connection quickly, thus keeping management unavailability to a minimum. In selecting a backup router, it is common practice to choose the default gateway of the management network that is directly connected to your routing device.

It is important to make sure that the specified backup router address is reachable and directly connected. The backup router address should be an address that is directly connected to the management interface.



NOTE: Router A can be the backup router for Router B, and Router B can be the backup router for Router A if the management interface of each router is connected to an interface on the other router, thus providing the necessary reachability.

When the routing protocol process starts, the backup route (the route created by the backup router) is removed, and any default, static, or protocol-learned routes are installed.

If the routing device has a backup Routing Engine (usually RE1), the backup router remains active, unless nonstop active routing is configured.

Related Documentation • [Configuring a Backup Router on page 66](#)

Configuring a Backup Router

The backup router allows the routing device to install a route to the management network, before the routing protocol process (rpd) is up and running. This allows the device to establish a Layer 3 connection quickly, thus keeping management unavailability to a minimum.

When a routing device is booting, the routing protocol process is not running. Therefore, the router or switch has no routes. To ensure that the router or switch is reachable for management purposes while it boots or if the routing protocol process fails to start properly, configure a backup router, which is a router that is directly connected to the local router or switch (that is, on the same subnet) through its private management interface (for example, fxp0 or me0).

To achieve network reachability while loading, configuring, and recovering the router or switch, but without installing a default route in the forwarding table, include the **destination** option, specifying an address that is reachable through the backup router. Specify the address in the format **network/mask-length**.

Any destinations defined by the backup router are not visible in the routing table. They are only visible in the local forwarding table when the routing protocol process is not running. Therefore, a recommended best practice is to also include the destinations of the backup router configured as static routes with the **retain** option. The **retain** option is necessary to allow the static route to remain in the forwarding table when the routing protocol process stops running, because the routing table does not exist if the routing protocol process is not running.

On systems with dual redundant Routing Engines, the backup Routing Engine's reachability through the private management interface is based only on the functionality of the **backup-router** configuration. It is not based on whether the routing protocol process is running. On both Routing Engines, the **backup-router** statement adds the destination prefix upon bootup. On the master Routing Engine, a static route requires the routing protocol process to be running first before installing the destination prefix to the routing and forwarding tables.

Due to a system limitation, do not configure the destination address specified in the backup-router as 0.0.0.0/0 or ::/0. The mask has to be a nonzero value.

Active routes and more specific routes take precedence over destination prefixes defined with the **backup-router** statement.

If you have a backup router configuration in which multiple static routes point to a gateway from the management Ethernet interface, you must configure prefixes that are more specific than the static routes or include the **retain** option at the **[edit routing-options static route]** hierarchy level.

For example, if you configure the static route 172.16.0.0/12 from the management Ethernet interface for management purposes, you must specify the backup router configuration as follows:

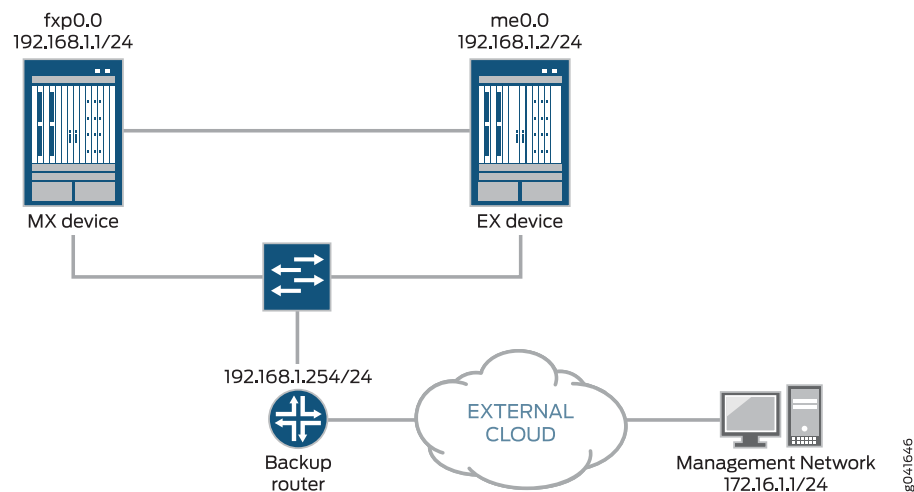
```
backup-router 172.29.201.62 destination [172.16.0.0/13 172.16.128.0/13]
```

Configuring a Backup Router Running IPv4

In the example shown in [Figure 2 on page 67](#), the backup router is the default gateway of the management network.

As required, the backup router address is reachable and directly connected to the management interfaces on the two routing devices (fxp0 and me0).

Figure 2: Backup Router Sample Topology



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

To configure a backup router running IPv4:

1. Include the **backup-router** statement at the **[edit system]** hierarchy level.

```
[edit groups group-name system]
backup-router address <destination destination-address>;
```

For example:

```
[edit groups re0 system]
backup-router 192.168.1.254 destination 172.16.1.0/24;

[edit groups re1 system]
backup-router 192.168.1.254 destination 172.16.1.0/24;
```

2. (Optional) Configure a static route to the management network.

Junos OS only uses the backup router during the boot sequence. If you want to configure a backup router for use after startup, you can set up a static route. The static route goes into effect when the routing protocol process is running.

```
routing-options {
  static {
    route 172.16.1.0/24 {
      next-hop 192.168.1.254;
      retain;
    }
  }
}
```

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

For example:

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

4. Commit the changes:

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

Configuring a Backup Router Running IPv6

To configure a backup router running IPv6:

1. Include the **inet6-backup-router** statement at the **[edit system]** hierarchy level.

```
[edit groups group-name system]
inet6-backup-router address <destination destination-address>;
```

For example:

```
[edit groups re0 system]
inet6-backup-router 8:3::1 destination abcd::/48;

[edit groups re1 system]
inet6-backup-router 8:3::1 destination abcd::/48;
```

2. (Optional) Configure a static route to the management network.

Junos OS only uses the backup router during the boot sequence. If you want to configure a backup router for use after startup, you can set up a static route. The static route goes into effect when the routing protocol process is running.

```
routing-options {
  rib inet6.0 {
    static {
      route abcd::/48 {
        next-hop 8:3::1;
        retain;
      }
    }
  }
}
```

```
    }  
  }  
}
```

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

For example:

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

4. Commit the changes:

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

**Related
Documentation**

- [Understanding Backup Routers on page 65](#)
- *Configuring Junos OS for the First Time on a Router or Switch with a Single Routing Engine*
- *Configuring Junos OS for the First Time on a Device with Dual Routing Engines*
- *Requirements for Routers with a Backup Router Configuration.*

CHAPTER 9

Configuration Statements

- [announcement](#) on page 72
- [archival](#) on page 73
- [archive-sites \(Configuration File\)](#) on page 74
- [autoinstallation](#) on page 76
- [backup-router](#) on page 77
- [cli](#) on page 77
- [fast-synchronize](#) on page 78
- [synchronize](#) on page 79
- [compress-configuration-files \(System\)](#) on page 81
- [configuration](#) on page 82
- [configuration-servers](#) on page 83
- [domain-name](#) on page 84
- [domain-search](#) on page 85
- [dump-device](#) on page 86
- [events](#) on page 87
- [host-name](#) on page 88
- [inet6-backup-router](#) on page 89
- [interfaces](#) on page 90
- [load-key-file](#) on page 91
- [location \(System\)](#) on page 92
- [login-tip](#) on page 93
- [management-instance](#) on page 94
- [max-configurations-on-flash](#) on page 95
- [message](#) on page 96
- [mirror-flash-on-disk](#) on page 97
- [name-server](#) on page 98
- [non-subscriber-no-reply](#) on page 99
- [password \(Proxy Systems\)](#) on page 99

- [pic-console-authentication](#) on page 100
- [port \(Syslog\)](#) on page 101
- [port \(Proxy Server\)](#) on page 101
- [ports](#) on page 102
- [processes](#) on page 103
- [proxy \(System\)](#) on page 104
- [root-authentication](#) on page 105
- [root-login](#) on page 107
- [saved-core-context](#) on page 108
- [saved-core-files](#) on page 109
- [server \(Proxy\)](#) on page 109
- [static-host-mapping](#) on page 110
- [system](#) on page 111
- [transfer-interval \(Configuration\)](#) on page 112
- [transfer-on-commit](#) on page 113
- [trusted-key](#) on page 114
- [username \(System\)](#) on page 114

announcement

Syntax	<code>announcement text</code> ;
Hierarchy Level	[edit system login]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure a system login announcement. This announcement appears after a user logs in.
Options	text —Text of the announcement. If the text contains any spaces, enclose it in quotation marks.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Junos OS to Display a System Login Announcement</i>• message on page 96

archival

Syntax

```

archival {
  configuration {
    archive-sites {
      file://<path>/<filename>;
      ftp://username@host:<port>url-path password password;
      http://username@host:<port>url-path password password;
      pasvftp://username@host:<port>url-path password password;
      scp://username@host:<port>url-path password password;
    }
    transfer-interval interval;
    transfer-on-commit;
  }
}

```

Hierarchy Level [edit system]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Configure copying of the currently active configuration to an archive site. An archive site can be a file, or an FTP, HTTP, or SCP location.

Options The remaining statements are explained separately.



NOTE: The [edit system archival] hierarchy is not available on QFabric systems.

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

Related Documentation

- *Backing Up Configurations to an Archive Site*

archive-sites (Configuration File)

Syntax archive-sites {
 file://<path>/<filename>;
 ftp://username@host:<port>url-path password password;
 pasvftp://username@host:<port>url-path password password;
 scp://username@host:<port>url-path password password;
 }

Hierarchy Level [edit system archival configuration]

Release Information Statement introduced before Junos OS Release 7.4.
 Statement introduced in Junos OS Release 9.0 for EX Series switches.
 Statement introduced in Junos OS Release 11.1 for the QFX Series.
 Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Specify where to transfer the current configuration files. When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks (" ") and enclose the IPv6 host address in brackets ([]). For example,
"scp://username<:password>@[ipv6-host-address]<:port>/url-path"

If you specify more than one archive site, the router or switch attempts to transfer the configuration files to the first archive site in the list, moving to the next only if the transfer fails.

The destination filename is saved in the following format, where *n* corresponds to the number of the compressed configuration rollback file that has been archived:

router-name_YYYYMMDD_HHMMSS_juniper.conf.n.gz



NOTE: The time included in the destination filename is always in Coordinated Universal Time (UTC) regardless of whether the time on the router or switch is configured as UTC or the local time zone. The default time zone on the router or switch is UTC.



NOTE: The [edit system archival] hierarchy is not available on QFabric systems.

Options The prefix used in the configuration statement determines the form of transfer:

file:// —transfer on a path to a named file

ftp:// —transfer using active FTP server

pasvftp:// —transfer to a device that only accepts passive FTP services

scp:// —transfer to a known host using background SCP file transfers

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

Related Documentation	<ul style="list-style-type: none">• <i>Configuring Archive Sites for the Transfer of Active Configuration Files</i>• <i>Junos OS Commit Model for Configurations</i>• configuration on page 82• transfer-on-commit on page 113
------------------------------	---

autoinstallation

Syntax

```
autoinstallation {  
  configuration-servers {  
    url;  
  }  
  interfaces {  
    interface-name {  
      bootp;  
      rarp;  
    }  
  }  
}
```

Hierarchy Level [edit [system](#)]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.

Description Download a configuration file automatically from an FTP, Hypertext Transfer Protocol (HTTP), or Trivial FTP (TFTP) server. When you power on a router or switch configured for autoinstallation, it requests an IP address from a Dynamic Host Configuration Protocol (DHCP) server. Once the router or switch has an address, it sends a request to a configuration server and downloads and installs a configuration.

Options The remaining statements are explained separately. See [CLI Explorer](#).

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

Related Documentation

- *ACX Series Autoinstallation Overview*
- *Before You Begin Autoinstallation on an ACX Series Universal Metro Router*
- *Autoinstallation Configuration of ACX Series Universal Metro Routers*
- *USB Autoinstallation on ACX Series Routers*
- *Verifying Autoinstallation on ACX Series Universal Metro Routers*
- *show system autoinstallation status*
- *Upgrading Software by Using Automatic Software Download for Switches*
- [configuration-servers on page 83](#)
- *idle-timeout*

backup-router

Syntax	<code>backup-router <i>address</i> <destination <i>destination-address</i>>;</code>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Set a default router (running IP version 4 [IPv4]) to use while the local router (running IPv4) is booting and if the routing protocol processes fail to start. The Junos OS removes the route to this router as soon as the software starts.
Options	<p><i>address</i>—Address of the default router.</p> <p><i>destination <i>destination-address</i></i>—(Optional) Destination address that is reachable through the backup router. You can include this option to achieve network reachability while loading, configuring, and recovering the router, but without the risk of installing a default route in the forwarding table.</p> <p>Default: All hosts (default route) are reachable through the backup router.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring a Backup Router on page 66

cli

Syntax	<code>set cli prompt <i>prompt</i></code>
Hierarchy Level	[edit system login class <i>class-name</i>], [edit system login user <i>user-name</i>]
Release Information	Statement introduced in Junos OS Release 17.3R1.
Description	Set the CLI prompt specified for a specified login user or specified login class. The prompt set for the login user has precedence.
Options	<i>prompt <i>prompt</i></i> —Specify the prompt string you want to see displayed in the CLI prompt.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <code>set cli prompt</code>

fast-synchronize

Syntax	<code>fast-synchronize;</code>
Hierarchy Level	[edit <code>system</code> commit]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure commits to run in parallel (simultaneously) on both the master and backup Routing Engines to reduce the time required for commit synchronization. The fast-synchronize configuration is valid only on systems with two Routing Engines.



NOTE:

- When the **fast-synchronize** statement is configured, the commits on the master Routing Engine and the backup Routing Engine run in parallel. In this process, the configuration is validated only on the Routing Engine where you execute the **commit** command. Therefore, it is recommended not to include too many configuration details in groups like `re0` and `re1`, because the configuration specified in group `re0` is applied only if the current Routing Engine is in slot 0. Likewise, the configuration specified in group `re1` is applied only if the current Routing Engine is in slot 1.
- Ensure that the Junos OS software version running on both the Routing Engines is same.

Note the following prerequisites before configuring the **fast-synchronize** statement:

- Enable graceful Routing Engine switchover (GRES) by configuring the **chassis redundancy graceful-switchover** command.
- Configure the **system commit synchronize** command to automatically result in a commit synchronize action between dual Routing Engines within the same chassis.

Required Privilege Level	<code>system</code> —To view this statement in the configuration. <code>system-control</code> —To add this statement to the configuration.
---------------------------------	---

Related Documentation	<ul style="list-style-type: none">• <i>Configuring Multiple Routing Engines to Synchronize Committed Configurations Automatically</i>• synchronize on page 79
------------------------------	--

synchronize

Syntax	synchronize;
Hierarchy Level	[edit system commit]
Release Information	Statement introduced in Junos OS Release 7.4. Statement introduced in Junos OS Release 10.4 for EX Series switches.
Description	For devices with multiple Routing Engines only. Configure the commit command to automatically perform a commit synchronize action between dual Routing Engines within the same chassis. The Routing Engine on which you execute the commit command (the requesting Routing Engine) copies and loads its candidate configuration to the other (the responding) Routing Engine. Each Routing Engine then performs a syntax check on the candidate configuration file being committed. If no errors are found, the configuration is activated and becomes the current operational configuration on both Routing Engines.



NOTE: If you configure the **commit synchronize** statement at the [edit system] hierarchy level and issue a **commit** in the master Routing Engine, the master configuration is automatically synchronized with the backup. However, if the backup Routing Engine is down when you issue the **commit**, the Junos OS displays a warning and commits the candidate configuration in the master Routing Engine. When the backup Routing Engine comes up, its configuration will automatically be synchronized with the master. A newly inserted backup Routing Engine automatically synchronizes its configuration with the master Routing Engine configuration.



NOTE: When you configure nonstop active routing (NSR), you must configure the **commit synchronize** statement. Otherwise, the **commit** operation fails.

On the TX Matrix router, synchronization only occurs between the Routing Engines within the same chassis. When synchronization is complete, the new configuration is then distributed to the Routing Engines on the T640 routers. That is, the master Routing Engine on the TX Matrix router distributes the configuration to the master Routing Engine on each T640 router. Likewise, the backup Routing Engine on the TX Matrix router distributes the configuration to the backup Routing Engine on each T640 router.

On the TX Matrix Plus router, synchronization only occurs between the Routing Engines within the switch-fabric chassis and when synchronization is complete, the new configuration is then distributed to the Routing Engines on the line-card chassis (LCC). That is, the master Routing Engine on the TX Matrix Plus router distributes the configuration to the master Routing Engine on each LCC. Likewise, the backup Routing

Engine on the TX Matrix Plus router distributes the configuration to the backup Routing Engine on each LCC.

In EX Series Virtual Chassis configurations:

- On EX4200 switches in Virtual Chassis, synchronization occurs between the switch in the master role and the switch in the backup role.
- On EX8200 switches in a Virtual Chassis, synchronization occurs only between the master and backup XRE200 External Routing Engines.

Options **and-quit**—(Optional) Quit configuration mode if the commit synchronization succeeds.

at—(Optional) Time at which to activate configuration changes.

comment—(Optional) Write a message to the commit log.

force—(Optional) Force a commit synchronization on the other Routing Engine (ignore warnings).

scripts—(Optional) Push scripts to the other Routing Engine.


Required Privilege **system**—To view this statement in the configuration.

Level **system-control**—To add this statement to the configuration.

Related • *Synchronizing the Routing Engine Configuration*

Documentation • *Configuring Multiple Routing Engines to Synchronize Committed Configurations Automatically*

compress-configuration-files (System)

Syntax	(compress-configuration-files no-compress-configuration-files);
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Compress the current operational configuration file. By default, the current operational configuration file is compressed, and is stored in the file juniper.conf, in the /config file system, along with the last three committed versions of the configuration. However, with large networks, the current configuration file might exceed the available space in the /config file system. Compressing the current configuration file allows the file to fit in the file system, typically reducing the size of the file by 90 percent. The current configuration file is compressed on the second commit of the configuration after the first commit is made to include the compress-configuration-files statement.</p>
	<div>  <p>NOTE: We recommend that you enable compression of the router configuration files to minimize the amount of disk space that they require.</p> </div>
Default	The current operational configuration file is uncompressed.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Compressing the Current Configuration File</i>

configuration

Syntax

```
configuration {
  transfer-interval interval;
  transfer-on-commit;
  archive-sites {
    file://<path>/<filename>;
    ftp://username@host:<port>url-path password password;
    http://username@host:<port>url-path password password;
    pasvftp://username@host:<port>url-path password password;
    scp://username@host:<port>url-path password password;
  }
}
```

Hierarchy Level [edit system archival]

Release Information Statement introduced before Junos OS Release 7.4.
 Statement introduced in Junos OS Release 9.0 for EX Series switches.
 Statement introduced in Junos OS Release 11.1 for the QFX Series.
 Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Configure the router or switch to periodically transfer its currently active configuration (or after each commit).



NOTE: The [edit system archival] hierarchy is not available on QFabric systems.

Options The remaining statements are explained separately. See [CLI Explorer](#).

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

Related Documentation

- [Backing Up Configurations to an Archive Site](#)
- [archive](#)
- [archive-sites on page 74](#)
- [transfer-interval on page 112](#)
- [transfer-on-commit on page 113](#)

configuration-servers

Syntax	configuration-servers { url; }
Hierarchy Level	[edit system autoinstallation]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	For EX Series switches only, configure the URL address of a server from which to obtain configuration files. Examples of URLs: <code>tftp://hostname/path/filename</code> <code>ftp://username:prompt@ftp.hostname.net/filename /</code>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Upgrading Software by Using Automatic Software Download for Switches</i> • Getting Started Guide for your router model • autoinstallation on page 76 • <i>idle-timeout</i>

domain-name

Syntax	<code>domain-name <i>domain-name</i>;</code>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure the name of the domain in which the router or switch is located. This is the default domain name that is appended to hostnames that are not fully qualified.
Options	<i>domain-name</i> —Name of the domain.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Reaching a Domain Name System Server on page 38

domain-search

Syntax	<code>domain-search [<i>domain-list</i>];</code>
Hierarchy Level	<code>[edit system],</code> <code>[edit system services dhcp],</code> <code>[edit system services dhcp],</code> <code>[edit system services dhcp pool],</code> <code>[edit system services dhcp static-binding]</code>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	Configure a list of domains to search (in the case where you want to configure access to multiple DNS servers for redundancy, and/or to resolve hosts that the previous server could not).
Options	<p><i>domain-list</i>—List of domain servers to search. The list can contain up to six domain names, separated by a space, with a total of up to 256 characters. For example to search domain1.net, and if it fails to resolve the host, domain2.net, and if fails to resolve the host, domain3.net, you would configure the following domain list at the domain-search hierarchy level:</p> <pre>[edit system] set domain-search [domain1.net domain2.net domain3.net]</pre>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring a Domain Name and Domain Search List for a DHCP Server Host</i> • Reaching a Domain Name System Server on page 38

dump-device

Syntax	<pre>dump-device { compact-flash; removable-compact-flash; usb; }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Configure the medium used for storing memory snapshots of system failure. When you specify the storage and an operating system fails, the operating system writes a snapshot of the state of the router when it failed to the storage medium. When the operating system is rebooted, the storage device is checked for a snapshot. If found, the snapshot of memory is written to the /var/crash directory on the router and can be examined by Juniper Networks customer support to help determine the cause of failure.</p> <p>If the swap partition on the device medium is not large enough for the system memory snapshot, the snapshot is not successfully written to the directory. Use the request system snapshot command to specify the swap partition.</p>
Options	<p>compact-flash—The primary CompactFlash card.</p> <p>removable-compact-flash—The CompactFlash card on the front of the router as the system software failure memory snapshot device.</p> <p>usb—The device attached to the universal serial bus (USB) port.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">Getting Started Guide for your router model

events

Syntax	<code>events [<i>events</i>];</code>
Hierarchy Level	[edit system accounting]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure the types of events to track and log.
Options	<i>events</i> —Event types; can be one or more of the following: <ul style="list-style-type: none">• change-log—Audit configuration changes.• interactive-commands—Audit interactive commands (any command-line input).• login—Audit logins.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Specifying TACACS+ Auditing and Accounting Events</i>

host-name

Syntax	<code>host-name <i>hostname</i>;</code>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Set the hostname of the router or switch.
Options	<i>hostname</i> —Name of the router or switch. The hostname can contain any combination of alphabetic characters, numbers, dashes, and underscores, and can include up to 255 characters. No other special characters are allowed.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Understanding Hostnames on page 33• Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 34


inet6-backup-router

Syntax	<code>inet6-backup-router <i>address</i> <destination <i>destination-address</i>>;</code>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Set a default router (running IP version 6 [IPv6]) to use while the local router or switch (running IPv6) is booting and if the routing protocol processes fail to start. The Junos OS removes the route to this router or switch as soon as the software starts.
Options	<p><i>address</i>—Address of the default router.</p> <p><i>destination destination-address</i>—(Optional) Destination address that is reachable through the backup router. You can include this option to achieve network reachability while loading, configuring, and recovering the router or switch, but without the risk of installing a default route in the forwarding table.</p> <p>Default: All hosts (default route) are reachable through the backup router.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring a Backup Router on page 66

interfaces

Syntax	<pre>interfaces { interface-name { bootp; rarp; } }</pre>
Hierarchy Level	[edit system autoinstallation]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure the interface on which to perform autoinstallation. A request for an IP address is sent from the interface. Specify the IP address procurement protocol.
Options	rarpbootp —Send requests over serial interfaces with Frame Relay. rarp —Send requests over Ethernet interfaces.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Upgrading Software by Using Automatic Software Download for Switches</i>• autoinstallation on page 76

load-key-file

Syntax	<code>load-key-file URL filename;</code>
Hierarchy Level	[edit system root-authentication], [edit system login user <i>username</i> authentication]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.1 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	<div>  NOTE: ECDSA is not supported on the QFabric system. </div> <p>Load RSA (SSH version 2) and DSA or ECDSA (SSH version 2) public keys from a previously-generated named file at a specified URL location or local path. The file contains one or more SSH keys that are copied into the configuration when the command is issued.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the Root Password</i> • <i>Configuring the Root Password</i> • Configuring Junos OS User Accounts by Using a Configuration Group on page 59

location (System)

Syntax	<pre>location { altitude <i>feet</i>; building <i>name</i>; country-code <i>code</i>; floor <i>number</i>; hcoord <i>horizontal-coordinate</i>; lata <i>transport-area</i>; latitude <i>degrees</i>; longitude <i>degrees</i>; npa-nxx <i>number</i>; postal-code <i>postal-code</i>; rack <i>number</i>; vcoord <i>vertical-coordinate</i>; }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure the system location in various formats.
Options	<p>altitude <i>feet</i>—Number of feet above sea level.</p> <p>building <i>name</i>—Name of building. The name of the building can be 1 to 28 characters in length. If the string contains spaces, enclose it in quotation marks (" ").</p> <p>country-code <i>code</i>—Two-letter country code.</p> <p>floor <i>number</i>—Floor in the building.</p> <p>hcoord <i>horizontal-coordinate</i>—Bellcore Horizontal Coordinate.</p> <p>lata <i>transport-area</i>—Local Access Transport Area.</p> <p>latitude <i>degrees</i>—Latitude in degree format.</p> <p>longitude <i>degrees</i>—Longitude in degree format.</p> <p>npa-nxx <i>number</i>—First six digits of the phone number (area code and exchange).</p> <p>postal-code <i>postal-code</i>—Postal code.</p> <p>rack <i>number</i>—Rack number.</p> <p>vcoord <i>vertical-coordinate</i>—Bellcore Vertical Coordinate.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.

Related Documentation • *Specifying the Physical Location of the Router or Switch*

login-tip

Syntax login-tip;

Hierarchy Level [edit system login class *class-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable CLI tips at login.

Default Disabled.

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

Related Documentation • *Configuring Login Tips*

management-instance

Syntax	management-instance;
Hierarchy Level	[edit system]
Release Information	Statement introduced in Junos OS Release 17.3R1.
Description	<p>Enable a dedicated management virtual routing and forwarding (VRF) instance.</p> <p>The management Ethernet interface (usually named fxp0 or em0) provides the out-of-band management network for the router. There is no clear separation between either out-of-band management traffic and in-band protocol control traffic, or user traffic at the routing-instance or routing table level. The management-instance configuration statement confines the management interface in a dedicated management instance, and it enables an administrative routing table dedicated to management tasks for the network device.</p> <p>The name of the dedicated management instance is reserved and hardcoded as mgmt_junos; you are prevented from configuring any other routing instance by the name mgmt_junos.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Management Interface in a Non-Default Instance on page 47

max-configurations-on-flash

Syntax	max-configurations-on-flash <i>number</i> ;
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the number of configurations stored on the CompactFlash card.
Options	<p><i>number</i>—The number of configurations stored on the CompactFlash card.</p> <p>Range: 0 through 49. The most recently saved configuration is number 0, and the oldest saved configuration is number 49.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card</i>

message

Syntax	<code>message text;</code>
Hierarchy Level	[edit system login]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	<p>Configure a system login message. This message appears before a user logs in.</p> <p>You can format the message using the following special characters:</p> <ul style="list-style-type: none">• \n—New line• \t—Horizontal tab• \'—Single quotation mark• \"—Double quotation mark• \\—Backslash
Options	<code>text</code> —Text of the message.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Junos OS to Display a System Login Message</i>• announcement on page 72

mirror-flash-on-disk

Syntax	mirror-flash-on-disk;
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4. Statement deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms run Junos OS with Upgraded FreeBSD, see the table listing the platforms currently running Junos OS with upgraded FreeBSD in *Release Information for Junos OS with Upgraded FreeBSD*.

Description Configure the hard disk to automatically mirror the contents of the CompactFlash card. The hard disk maintains a synchronized mirror copy of the CompactFlash card contents. Data written to the CompactFlash card is simultaneously updated in the mirrored copy of the hard disk. If the CompactFlash card fails to read data, the hard disk automatically retrieves its mirrored copy of the CompactFlash card.



CAUTION: We recommend that you disable flash disk mirroring when you upgrade or downgrade the router.

You cannot issue the `request system snapshot` command while the `mirror-flash-on-disk` statement is enabled.



NOTE: After you have enabled or disabled the `mirror-flash-on-disk` statement, you must reboot the router for your changes to take effect. To reboot, issue the `request system reboot` command.

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

Related Documentation

- *Configuring Automatic Mirroring of the CompactFlash Card on the Hard Disk Drive*

name-server

Syntax	<code>name-server { <i>address</i>; }</code>
Hierarchy Level	[edit system], [edit system services dhcp], [edit system services dhcp], [edit system services dhcp pool], [edit system services dhcp static-binding]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure one or more Domain Name System (DNS) name servers.
Options	<i>address</i> —Address of the name server. To configure multiple name servers, include a maximum of three <i>address</i> options.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Reaching a Domain Name System Server on page 38

non-subscriber-no-reply

Syntax	<code>non-subscriber-no-reply;</code>
Hierarchy Level	[edit <code>system</code> arp]
Release Information	Statement introduced in Junos OS Release 13.3R9 for the MX Series.
Description	Enable this option to drop ARP requests from non-subscribers when a user route is dynamically added for a subscriber. Configuring this statement suppresses the ARP response from the kernel when there is an ARP request for a loopback interface from static DHCP subscribers using a common LAN segment between two devices. However, this configuration might not be effective if the subscriber configuration has suppressed either a destination Layer 2 route or an access Layer 3 route.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>gratuitous-arp-delay</i> <i>interfaces</i>

password (Proxy Systems)

Syntax	<code>password password;</code>
Hierarchy Level	[edit <code>system</code> proxy]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the proxy server parameters for a device.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Example: Configuring a Proxy Server for License Updates</i>

pic-console-authentication

Syntax	<pre>pic-console authentication { (encrypted-password "password" plain-text-password); }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure console access to Physical Interface Cards (PICs).
Default	Disabled. By default, there is no password setting for console access.
Options	<p>encrypted-password "password"—Use MD5 or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password.</p> <p>You cannot configure a blank password for encrypted-password using blank quotation marks (" "). You must configure a password whose number of characters range from 1 through 128 characters and enclose the password in quotation marks.</p> <p>plain-text-password—Use a plain-text password. The CLI prompts you for the password and then encrypts it. The CLI displays the encrypted version, and the software places the encrypted version in its user database. You can specify only one plain-text password.</p> <p>The default requirements for plain-text passwords are:</p> <ul style="list-style-type: none">• The password must be between 6 and 128 characters long• You can include most character classes in a password (uppercase letters, lowercase letters, numbers, punctuation marks, and other special characters). Control characters are not recommended.• Valid passwords must contain at least one change of case or character class.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Junos OS to Set Console and Auxiliary Port Properties</i>• <i>Configuring Password Authentication for Console Access to PICs</i>

port (Syslog)

Syntax	<code>port <i>port number</i>;</code>
Hierarchy Level	[edit system syslog host <i>hostname</i> other-routing-engine scc-master)]
Release Information	Statement introduced in Junos OS Release 11.3.
Description	Specify the port number for the remote syslog server.
Options	<p><i>port number</i>—Port number of the remote syslog server.</p> <p>Range: 0 through 65535</p> <p>Default: 514</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>syslog</i> • <i>host</i>

port (Proxy Server)

Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	[edit system proxy]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the port number for the proxy server ranging from 0 through 65535 .
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Configuring a Proxy Server for License Updates</i>

ports

Syntax	<pre>ports { auxiliary { disable; insecure; type <i>terminal-type</i>; port-type (mini-usb rj45); } console { disable; insecure; log-out-on-disconnect; type <i>terminal-type</i>; } }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	<p>Configure the properties of the console and auxiliary ports. The ports are located on the router's craft interface.</p> <p>See the switch's hardware documentation for port locations.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Junos OS to Set Console and Auxiliary Port Properties</i>

processes

Syntax `processes {
 process-name (enable | disable) failover (alternate-media | other-routing-engine);
 timeout seconds;
}`

Hierarchy Level [edit system]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure which Junos OS processes are running on the router or switch.



CAUTION: Never disable any of the software processes unless instructed to do so by a customer support engineer.

Default All processes are enabled by default.

Options (enable | disable)—(Optional) Enable or disable a specified process.

failover (alternate-media | other-routing-engine)—(Optional) For routers or switches with redundant Routing Engines only, switch to backup media if a process fails repeatedly. If a process fails four times within 30 seconds, the router or switch reboots from the alternate media or the other Routing Engine.

process-name—One of the valid process names. You can obtain a complete list of process names by using the CLI command completion feature. After specifying a process name, command completion also indicates any additional options for that process.

timeout seconds—(Optional) How often the system checks the watchdog timer, in seconds. If the watchdog timer has not been checked in the specified number of seconds, the system reloads. If you set the time value too low, it is possible for the system to reboot immediately after it loads.

Values: 15, 60, or 180

Default: 180 seconds (rounded up to 291 seconds by the Junos kernel)

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

Related Documentation • *Disabling Junos OS Processes*

proxy (System)

Syntax	<pre>proxy { server (<i>hostname</i> <i>ip-address</i>); port <i>port-number</i>; username <i>username</i>; password <i>password</i>; }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	<p>Configure the proxy server properties for a device.</p> <p>The remaining statements are explained separately. See CLI Explorer.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring a Proxy Server for License Updates</i>

root-authentication

Syntax	<pre> root-authentication { (encrypted-password "password" plain-text-password); load-key-file URL:filename; no-public-keys ssh-dsa "public-key"; ssh-ecdsa "public-key"; ssh-rsa "public-key"; } </pre>
Hierarchy Level	[edit system]
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Configure the authentication methods for the root-level user, whose username is root.</p> <p>You can use the load-key-file URL:filename statement to load an SSH key file that was previously generated using ssh-keygen.</p> <p>Optionally, you can use the ssh-dsa, ssh-ecdsa, or ssh-rsa statements to directly configure SSH RSA, DSA, or ECDSA keys to authenticate root logins. You can configure more than one public key for SSH authentication of root logins as well as for user accounts. When a user logs in as root, the public keys are referenced to determine whether the private key matches any of them.</p> <p>To view the SSH keys entries, use the configuration mode show command. For example:</p> <pre> [edit system] user@host# set root-authentication load-key-file my-host:.ssh/id_dsa.pub .file.19692 0 KB 0.3 kB/s ETA: 00:00:00 100% [edit system] user@host# show root-authentication { ssh-rsa "ABC123 user@domain.net"; # SECRET-DATA } </pre>
Options	<p>encrypted-password "password"—MD5 or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password.</p> <p>You cannot configure a blank password for encrypted-password using blank quotation marks (" "). You must configure a password whose number of characters range from 1 through 128 characters and enclose the password in quotation marks.</p> <p>load-key-file URL:filename—Load an SSH key file that was previously generated using ssh-keygen. The URL:filename is the path to the file's location and name. When using this option, the contents of the key file are copied into the configuration immediately</p>

after entering the **load-key-file** *URL:filename* statement. This command loads RSA (SSH version 2) and DSA (SSH version 2) public keys.

no-public-keys—Disables SSH public key based authentication.

plain-text-password—Plain-text password. The CLI prompts you for the password and then encrypts it. The CLI displays the encrypted version, and the software places the encrypted version in its user database. You can specify only one plain-text password.

ssh-eccdsa "public/private-key"—SSH ECDSA (variant of DSA that uses elliptic curve cryptography) public key. You can specify one or more public keys.

ssh-dsa "public-key"—SSH version 2 authentication. Specify the DSA (SSH version 2) public key. You can specify one or more public keys.

ssh-rsa "public-key"—SSH version 2 authentication. Specify the RSA (SSH version 2) public key. You can specify one or more public keys.

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

Related Documentation	<ul style="list-style-type: none">• Junos OS User Accounts Overview on page 57• Protecting Network Security by Configuring the Root Password on page 28• Recovering the Root Password on page 30• <i>authentication</i>
------------------------------	--

root-login

Syntax	root-login (allow deny deny-password);
Hierarchy Level	[edit system services ssh]
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	Control user access through SSH.
Default	<p>root-login deny-password is the default for most systems.</p> <p>Starting in Junos release 17.4R1 for MX Series routers, the default for root-login is deny. In previous Junos releases, the default setting for the MX240, MX480, MX960, MX2010 and MX2020 was allow.</p>
Options	<p>allow—Allow users to log in to the router or switch as root through SSH.</p> <p>deny—Disable users from logging in to the router or switch as root through SSH.</p> <p>deny-password—Allow users to log in to the router or switch as root through SSH when the authentication method (for example, RSA authentication) does not require a password.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the Root Login Through SSH</i>

saved-core-context

Syntax	(saved-core-context no-saved-core-context);
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Configure whether the router saves core files generated by internal Junos processes, along with contextual information (system log files and a copy of the current configuration):</p> <ul style="list-style-type: none">• saved-core-context—The router saves each cores file and its associated context in a compressed tar file named <code>/var/tmp/process-name.core.core-number.tgz</code>.• no-saved-core-context—The router does not save cores files and their associated context. <p>The router saves core files.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Saving Core Files from Junos OS Processes</i>• saved-core-files on page 109

saved-core-files

Syntax	<code>saved-core-files <i>number</i>;</code>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Save core files generated by internal Junos processes, but not the associated contextual information (configuration and system log files).
Options	<i>number</i> —Maximum number of core files to save. Range: 1 through 10
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Saving Core Files from Junos OS Processes</i> • saved-core-context on page 108

server (Proxy)

Syntax	<code>server (<i>hostname</i> <i>ip-address</i>);</code>
Hierarchy Level	[edit system proxy]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the proxy server name or IP address.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Configuring a Proxy Server for License Updates</i>

static-host-mapping

Syntax	<pre>static-host-mapping { hostname { alias [<i>aliases</i>]; inet [<i>addresses</i>]; inet6 [<i>addresses</i>]; sysid <i>system-identifier</i>; } }</pre>
Hierarchy Level	[edit system]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(Optional) Statically map a hostname to one or more IP addresses and aliases, and configure an International Organization for Standardization (ISO) system identifier (system ID).
Default	If you do not statically map the hostname, the mapping is generated dynamically, based on the system configuration. For instance, if you omit the static-host-mapping hostname sysid statement, the IS-IS system ID is dynamically generated from the host portion of the ISO address configured on the loopback interface (lo0) and is mapped to the host-name statement configured at the [edit system] hierarchy level.
Options	<p>alias <i>alias</i>—Alias for the hostname.</p> <p>hostname—Fully qualified hostname.</p> <p>inet <i>address</i>—IP address. You can specify one or more IP addresses for the host.</p> <p>inet6 <i>address</i>—IP address. You can specify one or more IPv6 addresses for the host.</p> <p>sysid <i>system-identifier</i>—ISO system identifier (system ID). This is the 6-byte portion of the Intermediate System-to-Intermediate System (IS-IS) network service access point (NSAP). We recommend that you use the host's IP address represented in binary-coded decimal (BCD) format. For example, the IP address 208.197.169.18 is 2081.9716.9018 in BCD.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 34

system

Syntax	system { ... }
Hierarchy Level	[edit]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure system management properties.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>System Management Configuration Statements</i>

transfer-interval (Configuration)



Syntax	<code>transfer-interval <i>interval</i>;</code>
Hierarchy Level	[edit system archival configuration]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches. Statement introduced in Junos OS Release 11.1 for the QFX Series.
Description	Configure the router or switch to periodically transfer its currently active configuration to an archive site.
Options	<i>interval</i> —Interval at which to transfer the current configuration to an archive site. Range: 15 through 2880 minutes



NOTE: The [edit system archival] hierarchy is not available on QFabric systems.

Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the Periodic Transfer of the Active Configuration to an Archive Site</i>• <i>archive</i>• configuration on page 82• transfer-on-commit on page 113

transfer-on-commit

Syntax	transfer-on-commit;
Hierarchy Level	[edit system archival configuration]
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	Configure the router or switch to transfer its currently active configuration to an archive site each time you commit a candidate configuration.
	<p> NOTE: When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks (“ ”) and enclose the IPv6 host address in brackets ([]). For example, “ftp://username<:password>@[ipv6-host-address]<:port>/url-path” .</p>
	<p> NOTE: The [edit system archival] hierarchy is not available on QFabric systems.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed</i> • <i>archive</i> • configuration on page 82 • transfer-interval on page 112

trusted-key

Syntax	<code>trusted-key [<i>key-numbers</i>];</code>
Hierarchy Level	[edit system ntp]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	For NTP, configure the keys you are allowed to use when you configure the local router or switch to synchronize its time with other systems on the network.
Options	<i>key-numbers</i> —One or more key numbers. Each key can be any 32-bit unsigned integer except 0.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring NTP Authentication Keys</i>• <i>authentication-key</i>• <i>broadcast</i>• <i>peer</i>• <i>server</i>

username (System)

Syntax	<code>username <i>username</i>;</code>
Hierarchy Level	[edit system proxy]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the username as configured in the proxy server.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring a Proxy Server for License Updates</i>

PART 1

Administration

- [File Management Commands on page 117](#)
- [System Software Administrative Commands on page 137](#)
- [System Software Monitoring Commands on page 203](#)

CHAPTER 10

File Management Commands

- file archive
- file checksum md5
- file checksum sha1
- file checksum sha-256
- file compare
- file copy
- file delete
- file list
- file rename
- file show

file archive

Syntax	<code>file archive destination <i>destination</i> source <i>source</i> <compress></code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	<p>Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.</p> <p>For information on valid filename and URL formats, see <i>Format for Specifying Filenames and URLs in Junos OS CLI Commands</i>.</p>
Options	<p>destination <i>destination</i>—Destination of the archived file or files. Specify the destination as a URL or filename. The Junos OS adds one of the following suffixes if the destination filename does not already have it:</p> <ul style="list-style-type: none">• 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
Related Documentation	<ul style="list-style-type: none">• <i>Format for Specifying Filenames and URLs in Junos OS CLI Commands</i>
List of Sample Output	<p>file archive (Multiple Files) on page 118</p> <p>file archive (Single File) on page 119</p> <p>file archive (with Compression) on page 119</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file archive (Multiple Files)

The following sample command archives all message files in the local directory `/var/log/messages` as the single file `messages-archive.tar`.

```
user@host> file archive source /var/log/messages* destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.
user@host>
```

file archive (Single File)

The following sample command archives one message file in the local directory **/var/log/messages** as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.
user@host
```

file archive (with Compression)

The following sample command archives and compresses all message files in the local directory **/var/log/messages** as the single file **messages-archive.tgz**.

```
user@host> file archive compress source /var/log/messages* destination
/var/log/messages-archive.tgz
/usr/bin/tar: Removing leading / from absolute path names in the archive.
```

file checksum md5

Syntax	<code>file checksum md5 <pathname> filename</code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Description	Calculate the Message Digest 5 (MD5) checksum of a file.
Options	pathname —(Optional) Path to a filename. filename —Name of a local file for which to calculate the MD5 checksum.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Checksum Hashes for a Commit Script</i>• <i>Configuring Checksum Hashes for an Event Script</i>• <i>Configuring Checksum Hashes for an Op Script</i>• <i>Configuring Checksum Hashes for an SNMP Script</i>• <i>Executing an Op Script from a Remote Site</i>• file checksum sha-256 on page 122• file checksum sha1 on page 121
List of Sample Output	file checksum md5 on page 120
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum md5

```
user@host> file checksum md5 jbundle-5.3R2.4-export-signed.tgz
MD5 (jbundle-5.3R2.4-export-signed.tgz) = $ABC123
```


file checksum sha1

Syntax	<code>file checksum sha1 <pathname> filename</code>
Release Information	<p>Command introduced in Junos OS Release 9.5.</p> <p>Command introduced in Junos OS Release 9.5 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.
Options	<p>pathname—(Optional) Path to a filename.</p> <p>filename—Name of a local file for which to calculate the SHA-1 checksum.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Checksum Hashes for a Commit Script</i> • <i>Configuring Checksum Hashes for an Event Script</i> • <i>Configuring Checksum Hashes for an Op Script</i> • <i>Configuring Checksum Hashes for an SNMP Script</i> • <i>Executing an Op Script from a Remote Site</i> • file checksum md5 on page 120 • file checksum sha-256 on page 122
List of Sample Output	file checksum sha1 on page 121
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha1

```
user@host> file checksum sha1 /var/db/scripts/opscript.slax

SHA1 (/var/db/scripts/commitscript.slax) = $ABC123
```

file checksum sha-256

Syntax	<code>file checksum sha-256 <pathname> filename</code>
Release Information	Command introduced in Junos OS Release 9.5. Command introduced in Junos OS Release 9.5 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Description	Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.
Options	pathname —(Optional) Path to a filename. filename —Name of a local file for which to calculate the SHA-256 checksum.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Checksum Hashes for a Commit Script</i>• <i>Configuring Checksum Hashes for an Event Script</i>• <i>Configuring Checksum Hashes for an Op Script</i>• <i>Configuring Checksum Hashes for an SNMP Script</i>• <i>Executing an Op Script from a Remote Site</i>• file checksum md5 on page 120• file checksum sha1 on page 121
List of Sample Output	file checksum sha-256 on page 122
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha-256

```
user@host> file checksum sha-256 /var/db/scripts/commitscript.slax  
  
SHA256 (/var/db/scripts/commitscript.slax) =$ABC123
```

file compare

Syntax	<pre>file compare (files <i>filename filename</i>) <context unified> <ignore-white-space></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
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—The display is divided into two parts. The first part is the first file; the second part is the second file. Output lines preceded by an exclamation point (!) have changed. Additions are marked with a plus sign (+), and deletions are marked with a minus sign (-). • Unified—The display is preceded by the line number from the first and the second file (xx,xxx,x). Before the line number, additions to the file are marked with a plus sign (+), and deletions to the file are marked with a minus sign (-). The body of the output contains the affected lines. Changes are viewed as additions plus deletions.
Options	<p>files <i>filename</i>—Names of two local files to compare.</p> <p>context—(Optional) Display output in context format.</p> <p>ignore-white-space—(Optional) Ignore changes in the amount of white space.</p> <p>unified—(Optional) Display output in unified format.</p>
Required Privilege Level	none
Related Documentation	<ul style="list-style-type: none"> • <i>Format for Specifying Filenames and URLs in Junos OS CLI Commands</i> • <i>Viewing Core Files from Junos OS Processes</i>
List of Sample Output	<p>file compare files on page 125</p> <p>file compare files context on page 125</p>

[file compare files unified on page 125](#)

[file compare files unified ignore-white-space on page 126](#)

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

Sample Output

file compare files

```
user@host> file compare files /tmp/one /tmp/two
100c100
<          full-name "File 1";
---
>          full-name "File 2";
102c102
<          class foo; # 'foo' is not defined
---
>          class super-user;
```

file compare files context

```
user@host> file compare files /tmp/one /tmp/two context
*** /tmp/one   Wed Dec  3 17:12:50 2003
--- /tmp/two   Wed Dec  3 09:13:14 2003
*****
*** 97,104 ****
        }
    }
    user bill {
!         full-name "Bill Smith";
!         class foo; # 'foo' is not defined
        authentication {
            encrypted-password $ABC123;
        }
--- 97,105 ----
    }
    user bill {
!         full-name "Bill Smith";
!         uid 1089;
!         class super-user;
        authentication {
            encrypted-password $ABC123;
        }
    }
```

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-password $ABC123;
    }
}
```

file compare files unified ignore-white-space

```
user@host> file compare files /tmp/one /tmp/two unified ignore-white-space
--- /tmp/one    Wed Dec  3 09:13:10 2003
+++ /tmp/two    Wed Dec  3 09:13:14 2003
@@ -99,7 +99,7 @@
     user bill {
         full-name "Bill Smith";
         uid 1089;
-        class foo; # 'foo' is not defined
+        class super-user;
         authentication {
             encrypted-password $ABC123; # SECRET-DATA
         }
     }
```

file copy

Syntax `file copy source destination`
`<source-address address>`
`<staging-directory directory location>`

Release Information Command introduced before Junos OS Release 7.4.
source-address option added in Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 11.1 for QFX Series switches.
staging-directory option added in Junos OS Release 17.3DCB.

Description Copy files from one location to another location on the local device or to a location on a remote device reachable by the local device.

For information on valid filename and URL formats, see *Format for Specifying Filenames and URLs in Junos OS CLI Commands*.



WARNING: Starting with Junos OS Release 15.1, the `ssl3-support` option is not available for configuration with the `set system services xnm-ssl` and `file copy` commands. SSLv3 is no longer supported and available.

For all releases prior to and including Junos OS Release 14.2, SSLv3 is disabled by default at runtime. The `ssl3-support` option is hidden and deprecated in Junos OS Release 14.2 and earlier releases. However, you can use the `set system services xnm-ssl ssl3-support` command to enable SSLv3 for a Junos XML protocol client application to use as the protocol to connect to the Junos XML protocol server on a router, and you can use the `file copy source destination ssl3-support` command to enable the copying of files from an SSLv3 URL.

Using SSLv3 presents a potential security vulnerability, and we recommend that you not use SSLv3. For more details about this security vulnerability, go to <https://kb.juniper.net/InfoCenter/index?page=content&id=JSA10656>.



NOTE: If you define an ordered set of ciphers, key exchange methods, or message authentication codes (MACs) at the `[edit system services ssh]` hierarchy level, the newly-defined set is used when copying files using secure copy protocol (`scp`). For more information, see *Configuring the SSH Service to Support Legacy Cryptography*.

Required Privilege Level maintenance

Related Documentation

- *Format for Specifying Filenames and URLs in Junos OS CLI Commands*
- *Default Directories for Junos OS File Storage on the Router or Switch*
- *Copying a Configuration File from One Routing Engine to the Other*

List of Sample Output

[Copy a File from the Local Device to a Personal Computer on page 128](#)
[Copy a Configuration File between Routing Engines on page 128](#)
[Copy a Log File between Routing Engines on page 128](#)
[Copy a File from a TX Matrix Plus Router to a T1600 Router Connected to the TX Matrix Plus on page 128](#)
[Copy a File Using File Transfer Protocol on page 128](#)
[Copy a File Using File Transfer Protocol and Requiring a Password on page 129](#)
[Copy a File Using Secure Copy Protocol \(scp\) on page 129](#)
[Copy a File Using a Staging Directory on page 129](#)

Sample Output

The following are examples of a variety of file copy scenarios.

Copy a File from the Local Device to a Personal Computer

```
user@host> file copy /var/tmp/rpd.core.4 mypc:/c/junipero/tmp  
  
...transferring.file..... |           0 KB |    0.3 kB/s | ETA: 00:00:00 | 100%
```

Copy a Configuration File between Routing Engines

The following sample command copies a configuration file from Routing Engine 0 to Routing Engine 1:

```
user@host> file copy /config/juniper.conf re1:/var/tmp/copied-juniper.conf
```

Copy a Log File between Routing Engines

The following sample command copies a log file from Routing Engine 0 to Routing Engine 1:

```
user@host> file copy lcc0-re0:/var/log/chassisd lcc0-re1:/var/tmp
```

Copy a File from a TX Matrix Plus Router to a T1600 Router Connected to the TX Matrix Plus

The following sample command copies a text file from Routing Engine 1 on the switch-fabric chassis sfc0 to Routing Engine 1 on the line-card chassis lcc0:

```
user@host> file copy sfc0-re1:/tmp/sample.txt lcc0-re1:/var/tmp
```

Copy a File Using File Transfer Protocol

To use anonymous FTP to copy a local file to a remote system, enter the following command:

```
user@host>file copy filename ftp://hostname/filename
```

In the following example, `/config/juniper.conf` is the local file and `hostname` is the FTP server:


```

user@host> file copy /config/juniper.conf ftp://hostname/juniper.conf
Receiving ftp: //hostname/juniper.conf (2198 bytes): 100%
2198 bytes transferred in 0.0 seconds (2.69 MBps)

```

Copy a File Using File Transfer Protocol and Requiring a Password

To use FTP where you require more privacy and are prompted for a password, enter the following command:

```

root@host> file copy filename ftp://user@hostname/filename

```

In the following example, `/config/juniper.conf` is the local file and `hostname` is the FTP server:

```

root@host> file copy /config/juniper.conf ftp://user@hostname/juniper.conf
Password for user@hostname: *****
Receiving ftp: //user@hostname/juniper.conf (2198 bytes): 100%
2198 bytes transferred in 0.0 seconds (2.69 MBps)

```

Copy a File Using Secure Copy Protocol (scp)

To use scp to copy a local file to a remote system, enter the following command:

```

root@host> file copy filename scp://user@hostname/path/filename

```

In the following example, `/config/juniper.conf` is the local file, `user` is the username, and `ssh-host` is the scp server:

```

root@host> file copy /config/juniper.conf scp://user@ssh-host/tmp/juniper.conf
user@ssh-host's password: *****
juniper.conf          100%
|*****|
2198          00:00

```

Copy a File Using a Staging Directory

The following sample command copies a file using a staging directory

```

user@host> file copy re1:/var/tmp/junos-install-x.log /root/ staging-directory /var/tmp/tmp1

```

file delete

Syntax	<code>file delete <i>filename</i></code> <code><purge></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Description	Delete a file on the local router or switch.
Options	<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. <i>purge</i> —(Optional) Overwrite regular files before deleting them.
Required Privilege Level	maintenance
List of Sample Output	file delete on page 130 file delete (Routing Matrix) on page 130
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file delete

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete /var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```

file delete (Routing Matrix)

```
user@host> file list lcc0-re0:/var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete lcc0-re0:/var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```

file list

Syntax	<code>file list <detail recursive> <path></code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	Display a list of files on the local router or switch.
Options	<p>none—Display a list of files in the default directory. The default directory is the home directory of the user logged in to the router or switch.</p> <p>detail—(Optional) Display detailed information about the files. The output is similar to what is displayed by the Linux <code>ls -l</code> command.</p> <p>recursive—(Optional) Display detailed information about the files in the directory and all subdirectories below it.</p> <p>path—(Optional) List the files in a specified directory path.</p>
Additional Information	<p>To view available directories, enter a space and then a slash (/) after the file list command.</p> <p>To view files within a specific directory, include a slash followed by the directory and, optionally, subdirectory name after the file list command.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>file list on page 131</p> <p>file list (detailed) on page 132</p> <p>file list (recursive) on page 132</p>

Sample Output

file list

The following command lists the contents of the `/var/tmp` directory.

```
user@host> file list /var/tmp
```

```
/var/tmp:
trace_debug
package.log
pics/
downloads/
```

file list (detailed)

The following command lists detailed information about the contents of the `/var/tmp` directory.

```
user@host> file list /var/tmp detail
```

```
/var/tmp/:
total blocks: 4276224
-rw-r--r--  1 user  group      1362 Oct 16 11:11 trace_debug
-rw-r--r--  1 user  group      108 Aug 9  2016 package.log
drwxrwxrwx  2 user  group      512 Jun 30 2016 pics/
drwxr-xr-x  3 user  group      512 Aug 9  2016 downloads/
total files: 2
```

file list (recursive)

The following command lists detailed information about the contents of the `/var/tmp` directory and all subdirectories below it.

```
user@host> file list /var/tmp recursive
```

```
/var/tmp/:
total blocks: 4276224
-rw-r--r--  1 user  group      1362 Oct 16 11:11 trace_debug
-rw-r--r--  1 user  group      108 Aug 9  2016 package.log
drwxrwxrwx  2 user  group      512 Jun 30 2016 pics/
drwxr-xr-x  3 user  group      512 Aug 9  2016 downloads/
total files: 2

/var/tmp/pics:
total blocks: 5120461
-rw-r--r--  1 user  group      1910 Oct 15 2016 image3.png
-rw-r--r--  1 user  group      1852 Oct 15 2016 image2.png
-rw-r--r--  1 user  group      1310 Aug 9  2016 image1.png
total files: 3

/var/tmp/downloads:
total blocks: 24
-rw-r--r--  1 user  group      108 Aug 21 2016 package2.log
-rw-r--r--  1 user  group      108 Aug 9  2016 package1.log
drwxr-xr-x  2 user  group      512 Aug 9  2016 sub-download/
total files: 2

/var/tmp/downloads/sub-download:
total blocks: 16
total files: 0
```

file rename

Syntax	<code>file rename <i>source destination</i></code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	Rename a file on the local router or switch.
Options	<p><i>destination</i>—New name for the file.</p> <p><i>source</i>—Original name of the file. For a routing matrix, the filename must include the chassis information.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>file rename on page 133</p> <p>file rename (Routing Matrix) on page 133</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file rename

The following example lists the files in `/var/tmp`, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file rename /var/tmp/dcd.core /var/tmp/dcd.core.990413
user@host> file list /var/tmp
dcd.core.990413
rpd.core
snmpd.core
```

file rename (Routing Matrix)

The following example lists the files in `/var/tmp`, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
-----

/var/tmp:
```

```
.pccardd
sartre.conf
snmpd
syslogd.core-tarball.0.tgz

user@host> file rename lcc0-re0:/var/tmp/snmpd /var/tmp/snmpd.rr
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
-----

/var/tmp:
.pccardd
sartre.conf
snmpd.rr
syslogd.core-tarball.0.tgz
```

file show

Syntax	<code>file show <i>filename</i></code> <encoding (base64 raw)>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
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. encoding (base64 raw) —(Optional) Encode file contents with base64 encoding or show raw text.
Required Privilege Level	maintenance
List of Sample Output	file show on page 135 file show (Routing Matrix) on page 135
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

file show

```
user@host> file show /var/log/messages
Apr 13 21:00:08 dev1 /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 dev1 /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 dev1 last message repeated 4 times
Apr 13 21:07:04 dev1 last message repeated 8 times
Apr 13 21:07:13 dev1 /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 dev1 /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
...
```

file show (Routing Matrix)

```
user@host> file show lcc0-re0:/var/tmp/.gdbinit
lcc0-re0:
-----
#####
# Settings
#####
set print pretty

#####
# Basic stuff
```

```
#####

define msgbuf
    printf "%s", msgbufp->msg_ptr
end
# hex dump of a block of memory
# usage: dump address length
define dump
    p $arg0, $arg1
    set $ch = $arg0
    set $j = 0
    set $n = $arg1
    while ($j < $n)
        #printf "%x %x ",&$ch[$j],$ch[$j]
        printf "%x ",$ch[$j]
        set $j = $j + 1
        if (!($j % 16))
            printf "\n"
        end
    end
end
end
```


CHAPTER 11

System Software Administrative Commands

- clear system commit
- clear system reboot
- configure
- request system configuration rescue delete
- request system configuration rescue save
- request system halt
- request system license add
- request system license delete
- request system license save
- request system logout
- request system partition abort
- request system partition hard-disk
- request system power-off
- request system reboot
- request system snapshot
- request system software add
- request system zeroize

clear system commit

Syntax	clear system commit
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Clear any pending commit operation.
Options	This command has no options.
Required Privilege Level	maintenance (or the actual user who scheduled the commit)
Related Documentation	<ul style="list-style-type: none">• show system commit on page 208
List of Sample Output	clear system commit on page 138 clear system commit (None Pending) on page 138 clear system commit (User Does Not Have Required Privilege Level) on page 138
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system commit

```
user@host> clear system commit
Pending commit cleared.
```

clear system commit (None Pending)

```
user@host> clear system commit
No commit scheduled.
```

clear system commit (User Does Not Have Required Privilege Level)

```
user@host> clear system commit
error: Permission denied
```

clear system reboot

List of Syntax	Syntax on page 139 Syntax (EX Series Switches) on page 139 Syntax (TX Matrix Router) on page 139 Syntax (TX Matrix Plus Router) on page 139 Syntax (QFX Series) on page 139
Syntax	clear system reboot <both-routing-engines>
Syntax (EX Series Switches)	clear system reboot <all-members> <both-routing-engines> <local> <member <i>member-id</i> >
Syntax (TX Matrix Router)	clear system reboot <both-routing-engines> <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	clear system reboot <both-routing-engines> <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (QFX Series)	clear system reboot <infrastructure <i>name</i> > <interconnect-device <i>name</i> > <node-group <i>name</i> >
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Clear any pending system software reboots or halts. When issued on a TX Matrix router without any options, the default behavior clears all pending system software reboots or halts on all T640 routers connected to the TX Matrix router. When issued on a TX Matrix Plus router without any options, the default behavior clears all pending system software reboots or halts on all T1600 or T4000 routers connected to the TX Matrix Plus router.
Options	<p>none—Clear all pending system software reboots or halts.</p> <p>all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for all the Routing Engines in the chassis.</p>

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear all halt or reboot requests for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, clear all halt or reboot requests on the l connected T1600 or T4000 LCCs.

all-members—(EX4200 switches only) (Optional) Clear all halt or reboot requests on all members of the Virtual Chassis configuration.

both-routing-engines—(Systems with multiple Routing Engines) (Optional) Clear all halt or reboot requests on both Routing Engines. On a TX Matrix router, clear both Routing Engines on all chassis connected to the TX Matrix router. Likewise, on a TX Matrix Plus router, clear both Routing Engines on all chassis connected to the TX Matrix Plus router.

infrastructure *name*—(QFabric systems) (Optional) Clear all halt or reboot requests on the fabric control Routing Engines or fabric manager Routing Engines.

interconnect-device *name*—(QFabric systems) (Optional) Clear all halt or reboot requests on the Interconnect device.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear all halt or reboot requests for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, clear all halt or reboot requests for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches only) (Optional) Clear all halt or reboot requests on the local Virtual Chassis member.

member *member-id*—(EX4200 switches only) (Optional) Clear all halt or reboot requests on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value from 0 through 9.

node-group *name*—(QFabric systems) (Optional) Clear all halt or reboot requests on the Node group.

scc—(TX Matrix routers only) (Optional) Clear all halt or reboot requests for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for the TX Matrix Plus router. Replace *number* with 0.

Required Privilege Level maintenance

Related Documentation

- [request system reboot on page 168](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

- [clear system reboot on page 142](#)
- [clear system reboot \(TX Matrix Router\) on page 142](#)
- [clear system reboot \(QFX Series\) on page 142](#)

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

Sample Output

clear system reboot

```
user@host> clear system reboot
reboot requested by root at Sat Dec 12 19:37:34 1998
[process id 17855]
Terminating...
```

clear system reboot (TX Matrix Router)

```
user@host> clear system reboot
scc-re0:
-----
No shutdown/reboot scheduled.
lcc0-re0:
-----
No shutdown/reboot scheduled.
lcc2-re0:
-----
No shutdown/reboot scheduled.
```

clear system reboot (QFX Series)

```
user@switch> clear system reboot node-group node1
No shutdown/reboot scheduled.
```

configure

Syntax	configure <batch> <dynamic> <exclusive> <private>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
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>none—Enter configuration mode.</p> <p>batch—(Optional) Work in the batch commit mode where commit operations are executed in batches.</p> <p>dynamic—(Optional) Configure routing policies and certain routing policy objects in a dynamic database that is not subject to the same verification required in the standard configuration database. As a result, the time it takes to commit changes to the dynamic database is much shorter than for the standard configuration database. You can then reference these policies and policy objects in routing policies you configure in the standard database.</p> <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 OS Administration Library</i> .
Required Privilege Level	configure
Related Documentation	<ul style="list-style-type: none"> • show configuration on page 204
List of Sample Output	configure on page 144

Output Fields When you enter this command, you are placed in configuration mode and the system prompt changes from *hostname>* to *hostname#*.

Sample Output

configure

```
user@host> configure
Entering configuration mode
[edit]
user@host#
```


request system configuration rescue delete

Syntax request system configuration rescue delete

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
 Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Delete an existing rescue configuration.



NOTE: The [edit system configuration] hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation

- [request system configuration rescue save on page 146](#)
- [request system software rollback](#)
- [show system commit on page 208](#)

List of Sample Output [request system configuration rescue delete on page 145](#)

Output Fields This command produces no output.

Sample Output

request system configuration rescue delete

```
user@host> request system configuration rescue delete
```

request system configuration rescue save

Syntax request system configuration rescue save

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Save the most recently committed configuration as the rescue configuration so that you can return to it at any time by using the **rollback** command.



NOTE: The [edit system configuration] hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation

- *request system software delete*
- *request system software rollback*
- [show system commit on page 208](#)

List of Sample Output [request system configuration rescue save on page 146](#)

Output Fields This command produces no output.

Sample Output

request system configuration rescue save

```
user@host> request system configuration rescue save
```

request system halt

List of Syntax [Syntax on page 147](#)
 [Syntax \(EX Series Switches\) on page 147](#)
 [Syntax \(PTX Series\) on page 147](#)
 [Syntax \(TX Matrix Router\) on page 147](#)
 [Syntax \(TX Matrix Plus Router\) on page 148](#)
 [Syntax \(MX Series Router\) on page 148](#)
 [Syntax \(QFX Series\) on page 148](#)

Syntax request system halt
 <at *time*>
 <backup-routing-engine>
 <both-routing-engines>
 <other-routing-engine>
 <in *minutes*>
 <media (compact-flash | disk | removable-compact-flash | usb)>
 <message "*text*">

Syntax (EX Series Switches) request system halt
 <all-members>
 <at *time*>
 <backup-routing-engine>
 <both-routing-engines>
 <in *minutes*>
 <local>
 <media (external | internal)>
 <member *member-id*>
 <message "*text*">
 <other-routing-engine>
 <slice *slice*>

Syntax (PTX Series) request system halt
 <at *time*>
 <backup-routing-engine>
 <both-routing-engines>
 <other-routing-engine>
 <in *minutes*>
 <media (compact-flash | disk)>
 <message "*text*">

Syntax (TX Matrix Router) request system halt
 <all-lcc | lcc *number* | scc>
 <at *time*>
 <backup-routing-engine>
 <both-routing-engines>
 <other-routing-engine>
 <in *minutes*>
 <media (compact-flash | disk)>
 <message "*text*">

Syntax (TX Matrix Plus Router)	<pre>request system halt <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i>> <at <i>time</i>> <backup-routing-engine> <both-routing-engines> <other-routing-engine> <in <i>minutes</i>> <media (compact-flash disk)> <message "<i>text</i>"></pre>
Syntax (MX Series Router)	<pre>request system halt <all-members> <at <i>time</i>> <backup-routing-engine> <both-routing-engines> <in <i>minutes</i>> <local> <media (external internal)> <member <i>member-id</i>> <message "<i>text</i>"> <other-routing-engine></pre>
Syntax (QFX Series)	<pre>request system halt <all-members> <at <i>time</i>> <both-routing-engines> <director-device <i>director-device-id</i>> <in <i>minutes</i>> <local> <media > <member <i>member-id</i>> <message "<i>text</i>"> <other-routing-engine> <slice <i>slice</i>></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>other-routing-engine option introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>director-device option introduced for QFabric systems in Junos OS Release 12.2.</p> <p>backup-routing-engine option introduced in Junos OS Release 13.1.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Stop the router or switch software.



NOTE: When you issue this command on an individual component—for example, a Node device—in a QFabric system, you will receive a warning that says “Hardware-based members will halt, Virtual Junos Routing Engines will reboot.” If you want to halt only one member of a Node group, issue this command with the `member` option on the Node device CLI, because you cannot issue this command from the QFabric CLI. Also, issuing this command might cause traffic loss on an individual component.

When you issue this command on a QFX5100 switch, you are not prompted to reboot. You must power cycle the switch to reboot.



NOTE: For the routers with the Routing Engines RE-S-2x00x6, RE-PTX-2x00x8, and RE-S-2x00x8, this command is deprecated and might be removed completely in a future release.

On these routers, this command is replaced with the `request vmhost halt` command which provides similar functionality.

Options **none**—Stop the router or switch software immediately.

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Halt all chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, halt all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, halt all T1600 routers (or line-card chassis) connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Halt all members of the Virtual Chassis configuration.

at time —(Optional) Time at which to stop the software, specified in one of the following ways:

- **now**—Stop the software immediately. This is the default.
- **+minutes**—Number of minutes from now to stop the software.
- **yymmddhhmm**—Absolute time at which to stop the software, specified as year, month, day, hour, and minute.
- **hh:mm**—Absolute time on the current day at which to stop the software.

backup-routing-engine—(Optional) Halt the backup Routing Engine. This command halts the backup Routing Engine, regardless from which Routing Engine the command is executed. For example, if you issue the command from the master Routing Engine,

the backup Routing Engine is halted. If you issue the command from the backup Routing Engine, the backup Routing Engine is halted.

both-routing-engines—(Optional) Halt both Routing Engines at the same time.

director-device *director-device-id*—(QFabric systems only) Halt a specific Director device.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, halt a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, halt a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Halt the local Virtual Chassis member.

in *minutes*—(Optional) Number of minutes from now to stop the software. This option is an alias for the at *+minutes* option.

media (compact-flash | disk)—(Optional) Boot medium for the next boot.

media (external | internal)—(EX Series and QFX Series switches and MX Series routers only) (Optional) Halt the boot media:

- **external**—Halt the external mass storage device.
- **internal**—Halt the internal flash device.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Halt the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

message "*text*"—(Optional) Message to display to all system users before stopping the software.

other-routing-engine—(Optional) Halt the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is halted.

scc—(TX Matrix routers only) (Optional) Halt the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Halt the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

slice *slice*—(EX Series and QFX Series switches only) (Optional) Halt a partition on the boot media. This option has the following suboptions:

- 1—Halt partition 1.
- 2—Halt partition 2.
- **alternate**—Reboot from the alternate partition.

Additional Information On the M7i router, the **request system halt** command does not immediately power down the Packet Forwarding Engine. The power-down process can take as long as 5 minutes.

On a TX Matrix router and TX Matrix Plus router if you issue the **request system halt** command on the master Routing Engine, all the master Routing Engines connected to the routing matrix are halted. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are halted.



NOTE: If you have a router or switch with two Routing Engines and you want to shut the power off to the router or switch or remove a Routing Engine, you must first halt the backup Routing Engine (if it has been upgraded), and then halt the master Routing Engine. To halt a Routing Engine, issue the **request system halt** command. You can also halt both Routing Engines at the same time by issuing the **request system halt both-routing-engines** command.

Required Privilege Level maintenance

Related Documentation

- [clear system reboot on page 139](#)
- [request system power-off on page 163](#)
- *request vmhost halt*
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

- [request system halt on page 152](#)
- [request system halt \(In 2 Hours\) on page 152](#)
- [request system halt \(Immediately\) on page 152](#)
- [request system halt \(At 1:20 AM\) on page 152](#)

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

Sample Output

request system halt

```
user@host> request system halt
Halt the system ? [yes,no] (no) yes

*** FINAL System shutdown message from root@section2 ***
System going down IMMEDIATELY
Terminated
...
syncing disks... 11 8 done
The operating system has halted.
Please press any key to reboot.
```

request system halt (In 2 Hours)

The following example, which assumes that the time is 5 PM (1700), illustrates three different ways to request that the system stop 2 hours from now:

```
user@host> request system halt at +120
user@host> request system halt in 120
user@host> request system halt at 19:00
```

request system halt (Immediately)

```
user@host> request system halt at now
```

request system halt (At 1:20 AM)

To stop the system at 1:20 AM, enter the following command. Because 1:20 AM is the next day, you must specify the absolute time.

```
user@host> request system halt at yymmdd120
request system halt at 120
Halt the system at 120? [yes,no] (no) yes
```


request system license add

Syntax	<code>request system license add (<i>filename</i> terminal)</code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 9.5 for SRX Series devices.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Added additional information section on XML RPC in Junos OS Release 17.4.</p>
Description	Add a license key.
Options	<p><i>filename</i>—License key from a file or URL. Specify the filename or the URL where the key is located.</p> <p><i>terminal</i>—License key from the terminal.</p>
Additional Information	<p>Although the <code> display xml rpc</code> filter returns “xml rpc equivalent of this command is not available,” the following RPC is supported for license installation:</p> <pre><rpc> <request-license-add> <key-data> key </key-data> </request-license-add> </rpc></pre> <p>Where <i>key-data</i> is the license key data.</p> <pre><rpc> <request-license-add> <source> key-file </source> </request-license-add> </rpc></pre> <p>Where <i>source</i> is the URL of the source license key file.</p>
Required Privilege Level	maintenance
List of Sample Output	request system license add on page 153
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system license add

```
user@host> request system license add terminal
E408408918 aeaqib qcsbja okbuqe rcmxnq vjocwf uxfsta
          z5ufjb kdrmt6 57bimv 2f3ddp qttdcn 627q4a
```

```
jx4s5x hiri  
E408408918: successfully added  
add license complete (no errors)
```

request system license delete

Syntax	<code>request system license delete (<i>license-identifier</i> license-identifier-list [<i>licenseid001</i> <i>licenseid002</i> <i>licenseid003</i>] all)</code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Option license-identifier-list introduced in Junos OS Release 13.1.</p>
Description	Delete a license key. You can choose to delete one license at a time, all licenses at once, or a list of license identifiers enclosed in brackets.
Options	<p><i>license-identifier</i>—Text string that uniquely identifies a license key.</p> <p>license-identifier-list [<i>licenseid001</i> <i>licenseid002</i> <i>licenseid003</i>....]—Delete multiple license identifiers as a list enclosed in brackets.</p> <p>all—Delete all licenses on the device.</p>
Required Privilege Level	maintenance

request system license save

Syntax	<code>request system license save (<i>filename</i> terminal)</code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 9.5 for SRX Series devices.</p> <p>Added additional information section on XML RPC in Junos OS Release 17.4.</p>
Description	Save installed license keys to a file or URL.
Options	<p><i>filename</i>—License key from a file or URL. Specify the filename or the URL where the key is located.</p> <p><i>terminal</i>—License key from the terminal.</p>
Additional Information	<p>Although the <code> display xml rpc</code> filter returns “xml rpc equivalent of this command is not available,” the following RPC is supported for saving installed license keys to a file or URL:</p> <pre><rpc> <request-license-save> <destination>destination</destination> </request-license-save> </rpc></pre> <p>Where <i>destination</i> is the URL of the destination license key file.</p>
Required Privilege Level	maintenance
List of Sample Output	request system license save on page 156
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system license save

```
user@host> request system license save ftp://user@host/license.conf
```

request system logout

Syntax	<code>request system logout (pid <i>pid</i> terminal <i>terminal</i> user <i>username</i>) <all></code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Log out users from the router or switch and the configuration database. If a user held the configure exclusive lock, this command clears the exclusive lock.
Options	<p>all—(Optional) Log out all sessions owned by a particular PID, terminal session, or user. (On a TX Matrix or TX Matrix Plus router, this command is broadcast to all chassis.)</p> <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>
Required Privilege Level	configure
Related Documentation	<ul style="list-style-type: none"> • <i>Log a User Out of the Router</i>
List of Sample Output	request system logout on page 157
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system logout

```
user@host> request system logout user test all
Connection closed by foreign host.
```

request system partition abort

List of Syntax	Syntax on page 158 Syntax (TX Matrix Router) on page 158 Syntax (TX Matrix Plus Router) on page 158 Syntax (MX Series Router) on page 158
Syntax	request system partition abort
Syntax (TX Matrix Router)	request system partition abort <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	request system partition abort <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	request system partition abort <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms run Junos OS with Upgraded FreeBSD, see the table listing the platforms currently running Junos OS with upgraded FreeBSD in *Release Information for Junos OS with Upgraded FreeBSD*.

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-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Abort a previously scheduled partition operation for all chassis.</p> <p>all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, abort a previously scheduled partition operation on all T640 routers (line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, abort a previously scheduled partition operation on all routers (line-card chassis) connected to the TX Matrix Plus router.</p> <p>all-members—(MX Series routers only) (Optional) Abort a previously scheduled partition operation for all members of the Virtual Chassis configuration.</p>

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix Plus router, abort a previously scheduled partition operation on a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, abort a previously scheduled partition operation on a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Abort a previously scheduled partition operation for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Abort a previously scheduled partition operation for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Abort a previously scheduled partition operation on the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Abort a previously scheduled partition operation on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

Required Privilege Level maintenance

Related Documentation • [request system partition hard-disk on page 160](#)

List of Sample Output [request system partition abort on page 159](#)

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

Sample Output

[request system partition abort](#)

```
user@host> request system partition abort
The hard disk is no longer scheduled to be partitioned.
```

request system partition hard-disk

List of Syntax	Syntax on page 160 Syntax (TX Matrix Router) on page 160 Syntax (TX Matrix Plus Router) on page 160 Syntax (MX Series Router) on page 160
Syntax	request system partition hard-disk
Syntax (TX Matrix Router)	request system partition hard-disk <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	request system partition hard-disk <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	request system partition hard-disk <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms run Junos OS with Upgraded FreeBSD, see the table listing the platforms currently running Junos OS with upgraded FreeBSD in *Release Information for Junos OS with Upgraded FreeBSD*.

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 /altroot and /altconfig are saved and restored. All other data on the hard disk is at risk of being lost.
Options	<p>all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Schedule a partition of the hard disk for all routers in the chassis at its next reboot.</p> <p>all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, schedule a partition of the hard disk on all T640 routers connected to the TX Matrix router at their next reboot. On a TX Matrix Plus router, schedule a partition of the hard disk on all connected LCCs.</p> <p>all-members—(MX Series routers only) (Optional) Schedule a partition of the hard disk for all members of the Virtual Chassis configuration.</p>

lcc number—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix Plus router, schedule a partition of the hard disk on a specific T640 router connected to the TX Matrix router. On a TX Matrix Plus router, schedule a partition of the hard disk on a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Schedule a partition of the hard disk for the local member of the Virtual Chassis.

member member-id—(MX Series routers only) (Optional) Schedule a partition of the hard disk for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Schedule a partition of the hard disk on the T640 router connected to the TX Matrix router (or switch-card chassis).

sfc number—(TX Matrix Plus routers only) (Optional) Schedule a partition of the hard disk on the connected T1600 or T4000 LCCs connected to the TX Matrix Plus router. Replace *number* with 0.

Additional Information	To immediately partition the hard disk, use the request system reboot command. To cancel the partition request, use the request system partition abort command.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request system partition abort on page 158 • Routing Matrix with a TX Matrix Plus Router Solutions Page
List of Sample Output	request system partition hard-disk on page 162
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system partition hard-disk

```
user@host> request system partition hard-disk
WARNING: The hard disk is about to be partitioned. The contents
WARNING: of /altroot and /altconfig will be saved and restored.
WARNING: All other data is at risk. This is the setup stage, the
WARNING: partition happens during the next reboot.

Setting up to partition the hard disk ...

WARNING: A REBOOT IS REQUIRED TO PARTITION THE HARD DISK. Use the
WARNING: 'request system reboot' command when you are ready to proceed
WARNING: with the partitioning. To abort the partition of the hard disk
WARNING: use the 'request system partition abort' command.
```

request system power-off

List of Syntax	Syntax on page 163 Syntax (EX Series Switches) on page 163 Syntax (TX Matrix Router) on page 163 Syntax (TX Matrix Plus Router) on page 163 Syntax (MX Series Router) on page 163 Syntax (QFX Series) on page 164
Syntax	<pre>request system power-off <both-routing-engines> <other-routing-engine> <at <i>time</i>> <in <i>minutes</i>> <media (compact-flash disk removable-compact-flash usb)> <message "<i>text</i>"></pre>
Syntax (EX Series Switches)	<pre>request system power-off <all-members> <at <i>time</i>> <both-routing-engines> <in <i>minutes</i>> <local> <media (external internal)> <member <i>member-id</i>> <message "<i>text</i>"> <other-routing-engine> <slice <i>slice</i>></pre>
Syntax (TX Matrix Router)	<pre>request system power-off <all-chassis all-lcc lcc <i>number</i> scc> <both-routing-engines> <other-routing-engine> <at <i>time</i>> <in <i>minutes</i>> <media (compact-flash disk)> <message "<i>text</i>"></pre>
Syntax (TX Matrix Plus Router)	<pre>request system power-off <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i>> <both-routing-engines> <other-routing-engine> <at <i>time</i>> <in <i>minutes</i>> <media (compact-flash disk)> <message "<i>text</i>"></pre>
Syntax (MX Series Router)	<pre>request system power-off <all-members> <at <i>time</i>> <both-routing-engines></pre>

```
<in minutes>  
<local>  
<media (external | internal)>  
<member member-id>  
<message "text">  
<other-routing-engine>
```

Syntax (QFX Series) request system power-off
<at *time*>
<in *minutes*>
<media (external | internal)>
<message "*text*">
<slice *slice*>

Release Information Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Power off the Routing Engines.



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



NOTE: For a standalone chassis (such as MX Series, PTX Series, and T Series routers), the request to power off the system is applicable only to the Routing Engines. When you request to power off both Routing Engines, all the FPCs in the chassis shut down after approximately 10 minutes and the chassis fans run at full speed. The FPCs shut down because they no longer have communication with the Routing Engines and an Inter-Integrated Circuit (I2C) timeout occurred.



NOTE: For the routers with Routing Engines RE-S-2x00x6, RE-PTX-2x00x8, and RE-S-2x00x8, this command is deprecated and might be removed completely in a future release.

On these routers, this command is replaced with the request vmhost power-off command which provides similar functionality.

Options **none**—Power off the router or switch software immediately.

all-chassis—(Optional) (TX Matrix and TX Matrix Plus router only) Power off all Routing Engines in the chassis.

all-lcc—(Optional) (TX Matrix and TX Matrix Plus router only) On a TX Matrix router, power off all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, power off all T1600 routers (or line-card chassis) connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Power off all members of the Virtual Chassis configuration.

at *time*—(Optional) Time at which to power off the software, specified in one of the following ways:

- **now**—Power off the software immediately. This is the default.
- **+*minutes***—Number of minutes from now to power off the software.
- ***yymmddhhmm***—Absolute time at which to power off the software, specified as year, month, day, hour, and minute.
- ***hh:mm***—Absolute time on the current day at which to power off the software.

both-routing-engines—(Optional) Power off both Routing Engines at the same time.

in *minutes*—(Optional) Number of minutes from now to power off the software. This option is an alias for the **at +*minutes*** option.

lcc number—(Optional) (TX Matrix and TX Matrix Plus router only) On a TX Matrix router, power off a T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, power off a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Power off the local Virtual Chassis member.

media (compact-flash** | **disk**)**—(Optional) Boot medium for the next boot.

media (external | internal)—(EX Series and QFX Series switches and MX Series routers only) (Optional) Power off the boot media:

- **external**—Power off the external mass storage device.
- **internal**—Power off the internal flash device.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Power off the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

message "*text*"—(Optional) Message to display to all system users before powering off the software.

other-routing-engine—(Optional) Power off the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is halted.

scc—(Optional) (TX Matrix router only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix router (or switch-card chassis). If you issue the command from the master Routing Engine, the master SCC is powered off. If you issue the command from the backup Routing Engine, the backup SCC is powered off.

sfc *number*—(Optional) (TX Matrix Plus router only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix Plus router (or switch-fabric chassis). If you issue the command from the master Routing Engine, the master SFC is powered off. If you issue the command from the backup Routing Engine, the backup SFC is powered off. Replace ***number*** with zero.

slice *slice*—(EX Series and QFX Series switches only) (Optional) Power off a partition on the boot media. This option has the following suboptions:

- **1**—Power off partition 1.
- **2**—Power off partition 2.
- **alternate**—Reboot from the alternate partition.

Additional Information On a routing matrix composed of a TX Matrix router and T640 routers, if you issue the **request system power-off** command on the TX Matrix master Routing Engine, all the master Routing Engines connected to the routing matrix are powered off. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are powered off.

Likewise, on a routing matrix composed of a TX Matrix Plus router and T1600 routers, if you issue the **request system power-off** command on the TX Matrix Plus master Routing Engine, all the master Routing Engines connected to the routing matrix are powered off.

If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are powered off.

If you issue the **request system power-off both-routing-engines** command on the TX Matrix or TX Matrix Plus router, all the Routing Engines on the routing matrix are powered off.

Required Privilege Level maintenance

List of Sample Output [request system power-off on page 167](#)

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

Sample Output

[request system power-off](#)

```
user@host> request system power-off message "This router will be powered off in 30 minutes.
Please save your data and log out immediately."
warning: This command will not halt the other routing-engine.
If planning to switch off power, use the both-routing-engines option.
Power Off the system ? [yes,no] (no) yes
```

```
*** FINAL System shutdown message from remote@nutmeg ***
System going down IMMEDIATELY
```

```
This router will be powered off in 30 minutes. Please save your data and log out
immediately.
```

```
Shutdown NOW!
[pid 5177]
```

request system reboot

List of Syntax [Syntax on page 168](#)
 [Syntax \(EX Series Switches\) on page 168](#)
 [Syntax \(TX Matrix Router\) on page 168](#)
 [Syntax \(TX Matrix Plus Router\) on page 168](#)
 [Syntax \(MX Series Router\) on page 168](#)

Syntax request system reboot
 <at *time*>
 <both-routing-engines>
 <in *minutes*>
 <media (compact-flash | disk | removable-compact-flash | usb)>
 <message "*text*">
 <other-routing-engine>

Syntax (EX Series Switches) request system reboot
 <all-members>
 <at *time*>
 <both-routing-engines>
 <in *minutes*>
 <local>
 <media (external | internal)>
 <member *member-id*>
 <message "*text*">
 <other-routing-engine>
 <slice *slice*>

Syntax (TX Matrix Router) request system reboot
 <all-chassis | all-lcc | lcc *number* | scc>
 <at *time*>
 <both-routing-engines>
 <in *minutes*>
 <media (compact-flash | disk)>
 <message "*text*">
 <other-routing-engine>

Syntax (TX Matrix Plus Router) request system reboot
 <all-chassis | all-lcc | lcc *number* | sfc *number*>
 <at *time*>
 <both-routing-engines>
 <in *minutes*>
 <media (compact-flash | disk)>
 <message "*text*">
 <other-routing-engine>
 <partition (1 | 2 | alternate)>

Syntax (MX Series Router) request system reboot
 <all-members>
 <at *time*>
 <both-routing-engines>


```

<in minutes>
<local>
<media (external | internal)>
<member member-id>
<message "text">
<other-routing-engine>

```

Release Information Command introduced before Junos OS Release 7.4.
Option **other-routing-engine** introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Option **sfc** introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Option **both-routing-engines** introduced in Junos OS Release 12.1.

Description Reboot the software.



NOTE: Starting with Junos OS Release 15.1F3, the statement **request system reboot** reboots only the guest operating system on the PTX5000 with RE-PTX-X8-64G and, MX240, MX480, and MX960 with RE-S-X6-64G.

Starting with Junos OS Release 15.1F5, the statement **request system reboot** reboots only the guest operating system on the MX2010, and MX2020 with REMX2K-X8-64G.



NOTE: Starting from Junos OS Release 17.2R1, PTX10008 routers do not support the **request system reboot** command. Starting from Junos OS Release 17.4R1, PTX10016 routers do not support the **request system reboot** command. Use the **request vmhost reboot** command instead of the **request system reboot** command on the PTX10008 and PTX10016 routers to reboot the Junos OS software package or bundle on the router. See *request vmhost reboot*.

Options **none**—Reboot the software immediately.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router or TX Matrix Plus router, reboot all routers connected to the TX Matrix or TX Matrix Plus router, respectively.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router or TX Matrix Plus router, reboot all line card chassis connected to the TX Matrix or TX Matrix Plus router, respectively.

all-members—(EX4200 switches and MX Series routers only) (Optional) Reboot the software on all members of the Virtual Chassis configuration.

at time—(Optional) Time at which to reboot the software, specified in one of the following ways:

- **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.

both-routing-engines—(Optional) Reboot both Routing Engines at the same time.

in minutes—(Optional) Number of minutes from now to reboot the software. This option is an alias for the **at +minutes** option.

lcc number—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Reboot the software on the local Virtual Chassis member.

media (compact-flash | disk)—(Optional) Boot medium for next boot.

media (external | internal)—(EX Series switches and MX Series routers only) (Optional) Reboot the boot media:

- **external**—Reboot the external mass storage device.
- **internal**—Reboot the internal flash device.

member member-id—(EX4200 switches and MX Series routers only) (Optional) Reboot the software on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

message "text"—(Optional) Message to display to all system users before stopping or rebooting the software.

other-routing-engine—(Optional) 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.

partition—(TX Matrix Plus routers only) (Optional) Reboot using the specified partition on the boot media. This option has the following suboptions:

- 1—Reboot from partition 1.
- 2—Reboot from partition 2.
- **alternate**—Reboot from the alternate partition.

scc—(TX Matrix routers only) (Optional) Reboot the Routing Engine on the TX Matrix switch-card chassis. If you issue the command from re0, re0 is rebooted. If you issue the command from re1, re1 is rebooted.

sfc number—(TX Matrix Plus routers only) (Optional) Reboot the Routing Engine on the TX Matrix Plus switch-fabric chassis. If you issue the command from re0, re0 is rebooted. If you issue the command from re1, re1 is rebooted. Replace *number* with 0.

slice slice—(EX Series switches only) (Optional) Reboot a partition on the boot media. This option has the following suboptions:

- 1—Power off partition 1.
- 2—Power off partition 2.
- **alternate**—Reboot from the alternate partition.

Additional Information 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 TX Matrix or TX Matrix Plus router, 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: Before issuing the **request system reboot** command on a TX Matrix Plus router with no options or the **all-chassis**, **all-lcc**, **lcc number**, or **sfc** options, verify that master Routing Engine for all routers in the routing matrix are in the same slot number. If the master Routing Engine for a line-card chassis is in a different slot number than the master Routing Engine for a TX Matrix Plus router, the line-card chassis might become logically disconnected from the routing matrix after the **request system reboot** command.



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 Documentation	<ul style="list-style-type: none">• clear system reboot on page 139• request system halt on page 147• Routing Matrix with a TX Matrix Plus Router Solutions Page• request vmhost reboot
List of Sample Output	request system reboot on page 172 request system reboot (at 2300) on page 172 request system reboot (in 2 Hours) on page 172 request system reboot (Immediately) on page 172 request system reboot (at 1:20 AM) on page 173
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

[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@test.example.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 snapshot

List of Syntax	Syntax (ACX Series Routers) on page 174 Syntax (EX Series Switches; for EX4600, see QFX Series Syntax) on page 174 Syntax (MX Series Routers) on page 174 Syntax (PTX Series) on page 174 Syntax (QFX Series, QFabric System, OCX1100, and EX4600) on page 174 Syntax (TX Matrix Routers) on page 174 Syntax (TX Matrix Plus Routers) on page 174
Syntax (ACX Series Routers)	request system snapshot <media <i>type</i> > <partition>
Syntax (EX Series Switches; for EX4600, see QFX Series Syntax)	request system snapshot <all-members local member <i>member-id</i> > <media <i>type</i> > <partition> <re0 re1 routing-engine <i>routing-engine-id</i> > <slice alternate>
Syntax (MX Series Routers)	request system snapshot <all-members> <config-partition> <local> <member <i>member-id</i> > <media <i>usb-port-number</i> > <partition> <root-partition>
Syntax (PTX Series)	request system snapshot <partition>
Syntax (QFX Series, QFabric System, OCX1100, and EX4600)	request system snapshot <all-members local member <i>member-id</i> > <config-partition> <media <i>type</i> > <partition> <root-partition> <slice alternate>
Syntax (TX Matrix Routers)	request system snapshot <all-chassis all-lcc lcc <i>number</i> scc> <config-partition> <partition> <root-partition>
Syntax (TX Matrix Plus Routers)	request system snapshot <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> > <config-partition>

<partition>
<root-partition>

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 10.0 for EX Series switches.
 Command introduced in Junos OS Release 11.3 for the QFX Series.
 Command introduced in Junos OS Release 12.2 for ACX Series routers.
 Options <config-partition> and <root-partition> introduced in Junos OS Release 13.1 for M Series, MX Series, T Series, and TX Series routers.
 Option **media usb-port-number** introduced in Junos OS Release 13.2 for MX104 routers.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
 Options <config-partition>, <root-partition>, and <slice> deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1



NOTE: To determine which platforms support Junos OS with upgraded FreeBSD, see [Feature Explorer](#) and enter one of the following:

- For non-virtualized, enter **freebsd** and select Junos kernel upgrade to FreeBSD 10+.
- For virtualized, enter **virtualization** and select **Virtualization of the Routing Engine**.

Description

- On the router, back up the currently running and active file system partitions 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.
- On the switch, take a snapshot of the files currently used to run the switch—the complete contents of the root (/), **/altroot**, **/config**, **/var**, and **/var-tmp** directories, which include the running Junos OS, the active configuration, and log files.



NOTE: System snapshot is not supported on QFX10000 switches.



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.



NOTE: Starting with Junos OS Release 15.1F3, the command `request system snapshot` creates a snapshot of the guest OS image only for the PTX5000 with RE-DUO-C2600-16G, and the MX240, MX480, and MX960 routers with RE-S-1800X4-32G-S.

Starting with Junos OS Release 15.1F5, the command `request system snapshot` creates a snapshot of the guest OS image only for the MX2010 and MX2020 routers with REMX2K-1800-32G-S.

On these routers, in order to create snapshot of the host OS image along with Junos OS image, use the `request vmhost snapshot` command.

Options The specific options available depend upon the router or switch:

none—Back up the currently running software as follows:

- On the router, back up the currently running and active file system partitions 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.
- On the switch, take a snapshot of the files currently used to run the switch and copy them to the media that the switch did not boot from. If the switch is booted from internal media, the snapshot is copied to external (USB) media. If the switch is booted from external (USB) media, the snapshot is copied to internal media.
- If the snapshot destination is external media but a USB flash drive is not connected, an error message is displayed.
- If the automatic snapshot procedure is already in progress, the command returns the following error: **Snapshot already in progress. Cannot start manual snapshot.** For additional information about the automatic snapshot feature, see *Configuring Dual-Root Partitions*.

all-chassis | all-lcc | lcc number —(TX Matrix and TX Matrix Plus router only) (Optional)

- **all-chassis**—On a TX Matrix router, archive data and executable areas for all Routing Engines in the chassis. On a TX Matrix Plus router, archive data and executable areas for all Routing Engines in the chassis.
- **all-lcc**—On a TX Matrix router, archive data and executable areas for all T640 routers (or line-card chassis) connected to a TX Matrix router. On a TX Matrix Plus router, archive data and executable areas for all routers (or line-card chassis) connected to a TX Matrix Plus router.
- **lcc number**—On a TX Matrix router, archive data and executable areas for a specific T640 router (or line-card chassis) that is connected to a TX Matrix router. On a

TX Matrix Plus router, archive data and executable areas for a specific router (line-card chassis) that is connected to a TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

all-members | local | member *member-id*—(EX Series Virtual Chassis, MX Series routers, QFX Series switches, QFabric System, and OCX1100 only) (Optional) Specify where to place the snapshot (archive data and executable areas) in a Virtual Chassis:

- **all-members**—Create a snapshot (archive data and executable areas) for all members of the Virtual Chassis.
- **local**—Create a snapshot (archive data and executable areas) on the member of the Virtual Chassis that you are currently logged into.
- **member *member-id***—Create a snapshot (archive data and executable areas) for the specified member of the Virtual Chassis.

config-partition—(EX Series Virtual Chassis, MX Series routers, QFX Series switches, QFabric System, OCX1100, and T and TX Series routers only) Create a snapshot of the configuration partition only and store it onto the default **/altconfig** on the hard disk device or an **/altconfig** on a USB device. Option deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms support Junos OS with upgraded FreeBSD, see [Feature Explorer](#) and enter one of the following:

- For non-virtualized, enter **freebsd** and select Junos kernel upgrade to FreeBSD 10+.
- For virtualized, enter **virtualization** and select Virtualization of the Routing Engine.

media type—(ACX Series, M320, T640, MX960 routers, and EX Series switches, QFX Series switches, QFabric System, and OCX1100 only) (Optional) Specify the boot device the software is copied to:

- **compact-flash**—Copy software to the primary compact flash drive.
- **external**—(Switches only) Copy software to an external mass storage device, such as a USB flash drive. If a USB drive is not connected, the switch displays an error message.
- **internal**—Copy software to an internal flash drive.
- **removable-compact-flash**—Copy software to the removable compact flash drive.
- **usb**—(ACX Series, M320, T640, MX960 routers only) Copy software to the device connected to the USB port.
- **usb0**—(MX104 routers only) Copy software to the device connected to the USB0 port.
- **usb1**—(MX104 routers only) Copy software to the device connected to the USB1 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.

(Routers only) 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 OS Administration Library*.

(EX Series switches only) If the snapshot destination is the media that the switch did not boot from, you must use the **partition** option.

re0 | re1 | routing-engine routing-engine-id—(EX6200 and EX8200 switches only) Specify where to place the snapshot in a redundant Routing Engine configuration.

- **re0**—Create a snapshot on Routing Engine 0.
- **re1**—Create a snapshot on Routing Engine 1.
- **routing-engine routing-engine-id**—Create a snapshot on the specified Routing Engine.

root-partition—(M, MX, T, and TX Series routers; EX Series Virtual Chassis; QFX Series switches; QFabric System; and OCX1100 only) Create a snapshot of the root partition only and store it onto the default **/altroot** on the hard disk device or an **/altroot** on a USB device. Option deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms run Junos OS with Upgraded FreeBSD, see the information in *Release Information for Junos OS with Upgraded FreeBSD*.

slice alternate—(EX Series switches, EX Series Virtual Chassis, QFX Series switches, QFabric System, and OCX1100 only) (Optional) Take a snapshot of the active root partition and copy it to the alternate slice on the boot media.

Option deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms support Junos OS with upgraded FreeBSD, see [Feature Explorer](#) and enter one of the following:

- For non-virtualized, enter **freebsd** and select Junos kernel upgrade to FreeBSD 10+.
- For virtualized, enter **virtualization** and select **Virtualization of the Routing Engine**.

scc—(TX Matrix router only) (Optional) Archive data and executable areas for a TX Matrix router (or switch-card chassis).

sfc number—(TX Matrix Plus router only) (Optional) Archive data and executable areas for a TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

Additional Information

- (Routers only) 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.
- (Routers only) 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 OS Administration Library*.
- (TX Matrix and TX Matrix Plus router only) 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.

Required Privilege Level view

Related Documentation

- [request system snapshot \(Junos OS with Upgraded FreeBSD\)](#)
- [show system snapshot on page 258](#)
- [show system auto-snapshot](#)

List of Sample Output

- [request system snapshot \(Routers\) on page 180](#)
- [request system snapshot \(EX Series Switches\) on page 180](#)
- [request system snapshot partition \(EX4600, QFX Series, QFabric System, and OCX1100\) on page 181](#)
- [request system snapshot \(When the Partition Flag Is On\) on page 181](#)
- [request system snapshot \(MX104 Routers When Media Device is Missing\) on page 181](#)
- [request system snapshot \(When Mirroring Is Enabled\) on page 181](#)
- [request system snapshot all-lcc \(Routing Matrix\) on page 181](#)
- [request system snapshot all-members \(Virtual Chassis\) on page 181](#)

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

Sample Output

request system snapshot (Routers)

```
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 (EX Series Switches)

```
user@switch> request system snapshot partition
Clearing current label...
Partitioning external media (/dev/da1) ...
Partitions on snapshot:

Partition Mountpoint Size Snapshot argument
s1a /altroot 179M none
s2a / 180M none
s3d /var/tmp 361M none
s3e /var 121M none
s4d /config 60M none
Copying '/dev/da0s1a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s2a' to '/dev/da1s2a' .. (this may take a few minutes)
Copying '/dev/da0s3d' to '/dev/da1s3d' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/da1s3e' .. (this may take a few minutes)
Copying '/dev/da0s4d' to '/dev/da1s4d' .. (this may take a few minutes)
The following filesystems were archived: /altroot / /var/tmp /var /config
```

request system snapshot partition (EX4600, QFX Series, QFabric System, and OCX1100)

```

user@switch> request system snapshot partition
Clearing current label...
Partitioning external media (da1) ...
Verifying compatibility of destination media partitions...
Running newfs (334MB) on external media / partition ...
Running newfs (404MB) on external media /config partition ...
Running newfs (222MB) on external media /var partition ...
Copying '/dev/da0s2a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/da1s3e' .. (this may take a few minutes)
Copying '/dev/da0s2f' to '/dev/da1s1f' .. (this may take a few minutes)
The following filesystems were archived: / /config /var

```

request system snapshot (When the 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 (MX104 Routers When Media Device is Missing)

```

user@host > request system snapshot media usb0
error: usb0 media missing or invalid

```

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 snapshot all-lcc (Routing Matrix)

```

user@host> request system snapshot all-lcc
lcc0-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

lcc2-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 snapshot all-members (Virtual Chassis)

```

user@switch> request system snapshot all-members media internal
fpc0:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /

fpc1:
-----

```

```
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

```
fpc2:
```

```
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

```
fpc3:
```

```
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

```
fpc4:
```

```
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

```
fpc5:
```

```
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

request system software add

List of Syntax [Syntax on page 183](#)
 [Syntax \(EX Series Switches\) on page 183](#)
 [Syntax \(TX Matrix Router\) on page 183](#)
 [Syntax \(TX Matrix Plus Router\) on page 184](#)
 [Syntax \(MX Series Router\) on page 184](#)
 [Syntax \(QFX Series\) on page 184](#)
 [Syntax \(OCX Series\) on page 185](#)

Syntax `request system software add package-name`
 `<best-effort-load>`
 `<delay-restart>`
 `<device-alias alias-name>`
 `<force>`
 `<no-copy>`
 `<no-validate>`
 `<re0 | re1>`
 `<reboot>`
 `<satellite slot-id>`
 `<set [package-name1 package-name2]>`
 `<unlink>`
 `<upgrade-group [all | upgrade-group-name]>`
 `<upgrade-with-config>`
 `<satellite slot-id>`
 `<validate>`
 `<version version-string>`

Syntax (EX Series Switches) `request system software add package-name`
 `<best-effort-load>`
 `<delay-restart>`
 `<force>`
 `<no-copy>`
 `<no-validate>`
 `<re0 | re1>`
 `<reboot>`
 `<set [package-name1 package-name2]>`
 `<upgrade-with-config>`
 `<validate>`
 `<validate-on-host hostname>`
 `<validate-on-routing-engine routing-engine>`

Syntax (TX Matrix Router) `request system software add package-name`
 `<best-effort-load>`
 `<delay-restart>`
 `<force>`
 `<lcc number | scc>`
 `<no-copy>`
 `<no-validate>`
 `<re0 | re1>`
 `<reboot>`
 `<set [package-name1 package-name2]>`

<unlink>
<upgrade-with-config>
<validate>
<validate-on-host *hostname*>
<validate-on-routing-engine *routing-engine*>

Syntax (TX Matrix Plus Router) request system software add *package-name*
<best-effort-load>
<delay-restart>
<force>
<lcc *number* | sfc *number*>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<set [*package-name1* *package-name2*]>
<unlink>
<upgrade-with-config>
<validate>
<validate-on-host *hostname*>
<validate-on-routing-engine *routing-engine*>

Syntax (MX Series Router) request system software add *package-name*
<best-effort-load>
<delay-restart>
<device-alias *alias-name*>
<force>
<member *member-id*>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<satellite *slot-id*>
<set [*package-name1* *package-name2*]>
<upgrade-group [all | *upgrade-group-name*]>
<unlink>
<upgrade-with-config>
<validate>
<version *version-string*>
<validate-on-host *hostname*>
<validate-on-routing-engine *routing-engine*>

Syntax (QFX Series) request system software add *package-name*
<best-effort-load>
<component all>
<delay-restart>
<force>
<force-host>
<no-copy>
<partition>
<reboot>
<unlink>
<upgrade-with-config>

Syntax (OCX Series) request system software add *package-name*
 <best-effort-load>
 <delay-restart>
 <force>
 <force-host>
 <no-copy>
 <no-validate>
 <reboot>
 <unlink>
 <upgrade-with-config>
 <validate>

Release Information Command introduced before Junos OS Release 7.4.
best-effort-load and **unlink** options added in Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
set [package-name1 package-name2] option added in Junos OS Release 11.1 for EX Series switches. Added in Junos OS Release 12.2 for M Series, MX Series, and T Series routers.



NOTE: On EX Series switches, the **set [package-name1 package-name2]** option allows you to install only two software packages on a mixed EX4200 and EX4500 Virtual Chassis, whereas, on M Series, MX Series, and T Series routers, the **set [package-name1 package-name2 package-name3]** option allows you to install multiple software packages and software add-on packages at the same time.

upgrade-with-config and **upgrade-with-config-format format** options added in Junos OS Release 12.3 for M Series routers, MX Series routers, and T Series routers, EX Series Ethernet switches, and QFX Series devices.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
device-alias, **satellite**, **upgrade-group**, and **version** options introduced in Junos OS Release 14.2R3 for Junos Fusion.
validate-on-host and **validate-on-routing-engine** options added in Junos OS Release 15.1F3 for PTX5000 routers and MX240, MX480, and MX960 routers.
upgrade-with-config-format format option deleted in Junos OS Release 16.1 for M Series routers, MX Series routers, and T Series routers, EX Series Ethernet switches, and QFX Series devices.

Description



NOTE: We recommend that you always download the software image to **/var/tmp** only. On EX Series and QFX Series switches, you must use the **/var/tmp** directory. Other directories are not supported.

Install a software package or bundle on the router or switch.

For information on valid filename and URL formats, see *Format for Specifying Filenames and URLs in Junos OS CLI Commands*.



CAUTION: Any configuration changes performed after inputting the `request system software add` command will be lost when the system reboots with an upgraded version of Junos OS.



NOTE: Starting from Junos OS Release 17.2R1, PTX10008 routers do not support the `request system software add` command. Starting from Junos OS Release 17.4R1, PTX10016 routers do not support the `request system software add` command. Use the `request vmhost software add` command instead of the `request system software add` command on the PTX10008 and PTX10016 routers to install or upgrade the Junos OS software package or bundle on the router. See *request vmhost software add*.



NOTE: Starting from Junos OS Release 18.1R1, MX10003 routers do not support the `request system software add` command. Use the `request vmhost software add` command instead of the `request system software add` command on the MX10003 routers to install or upgrade the Junos OS software package or bundle on the router. See *request vmhost software add*.



NOTE: When graceful Routing Engine switchover (GRES) is enabled on a device, you must perform a unified ISSU operation to update the software running on the device. With GRES enabled, if you attempt to perform a software upgrade by entering the `request system software add package-name` command, an error message is displayed stating that only in-service-software-upgrades are supported when GRES is configured. In such a case, you must either remove the GRES configuration before you attempt the upgrade or perform a unified ISSU.



NOTE: Starting with Junos OS Release 15.1F3, the statement `request system software add` installs a software package for the guest OS only for the PTX5000 router with RE-DUO-C2600-16G, and for MX240, MX480, and MX960 routers with RE-S-1800X4-32G-S.

Starting with Junos OS Release 15.1F5, the statement `request system software add` installs a software package for the guest OS only for the MX2010 and MX2020 routers with REMX2K-1800-32G-S.

On these routers, in order to install both Junos software and host software packages, use the `request vmhost software add` command.

Options *package-name*—Location from which the software package or bundle is to be installed. For example:

- */var/tmp/package-name*—For a software package or bundle that is being installed from a local directory on the router or switch.
- *protocol://hostname/pathname/package-name*—For a software package or bundle that is to be downloaded and installed from a remote location. Replace *protocol* with one of the following:
 - **ftp**—File Transfer Protocol.
Use *ftp://hostname/pathname/package-name*. To specify authentication credentials, use *ftp://<username>:<password>@hostname/pathname/package-name*. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed.
 - **http**—Hypertext Transfer Protocol.
Use *http://hostname/pathname/package-name*. To specify authentication credentials, use *http://<username>:<password>@hostname/pathname/package-name*. If a password is required and you omit it, you are prompted for it.
 - **scp**—Secure copy (not available for limited editions).
Use *scp://hostname/pathname/package-name*. To specify authentication credentials, use *scp://<username>:<password>@hostname/pathname/package-name*.



NOTE:

- The *pathname* in the protocol is the relative path to the user's home directory on the remote system and not the root directory.
 - Do not use the `scp` protocol in the `request system software add` command to download and install a software package or bundle from a remote location. The previous statement does not apply to the QFabric switch. The software upgrade is handled by the management process (`mgd`), which does not support `scp`.
Use the `file copy` command to copy the software package or bundle from the remote location to the `/var/tmp` directory on the hard disk:
`file copy scp://source/package-name /var/tmp`
Then install the software package or bundle using the `request system software add` command:
`request system software add /var/tmp/package-name`
-

best-effort-load—(Optional) Activate a partial load and treat parsing errors as warnings instead of errors.

component all—(QFabric systems only) (Optional) Install software package on all of the QFabric components.

delay-restart—(Optional) Install a software package or bundle, but do not restart software processes.

device-alias *alias-name*—(Junos Fusion only) (Optional) Install the satellite software package onto the specified satellite device using the satellite device's alias name.

force—(Optional) Force the addition of the software package or bundle (ignore warnings).

force-host—(Optional) Force the addition of host software package or bundle (ignore warnings) on the QFX5100 device.

lcc *number* —(TX Matrix routers and TX Matrix Plus routers only) (Optional) In a routing matrix based on the TX Matrix router, install a software package or bundle on a T640 router that is connected to the TX Matrix router. In a routing matrix based on the TX Matrix Plus router, install a software package or bundle on a router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

member *member-id*—(MX Series routers only) (Optional) Install a software package on the specified Virtual Chassis member. Replace *member-id* with a value of 0 or 1.

partition—(QFX3500 switches only) (Optional) Format and repartition the media before installation.

satellite *slot-id*—(Junos Fusion only) (Optional) Install the satellite software package onto the specified satellite device using the satellite devices FPC slot identifier.

scc—(TX Matrix routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix Plus router. Replace *number* with 0.

no-copy—(Optional) Install a software package or bundle, but do not save copies of the package or bundle files.

no-validate—(Optional) When loading a software package or bundle with a different release, suppress the default behavior of the **validate** option.



NOTE: Software packages from unidentified providers cannot be loaded. To authorize providers, include the **provider-id** statement at the [edit system extensions provider] hierarchy level.

re0 | re1—(Optional) On routers or switches that support dual or redundant Routing Engines, load a software package or bundle on the Routing Engine in slot 0 (re0) or the Routing Engine in slot 1 (re1).

reboot—(Optional) After adding the software package or bundle, reboot the system. On a QFabric switch, the software installation is not complete until you reboot the component for which you have installed the software.

set [*package-name1 package-name2*]—(Mixed EX4200 and EX4500 Virtual Chassis, M Series, MX Series, and T Series routers only) (Optional) Install multiple packages at same time:

- In the case of mixed EX4200 and EX4500 Virtual Chassis, install two software packages—a package for an EX4200 switch and the same release of the package for an EX4500 switch—to upgrade all member switches in a mixed EX4200 and EX4500 Virtual Chassis.

- In the case of M Series, MX Series, and T Series routers, install multiple (two or more) software packages and software add-on packages at the same time. The variable **package-name** can either be a list of installation packages, each separated by a blank space, or the full URL to the directory or tar file containing the list of installation packages.

In each case, **installation-package** can either be a list of installation packages, each separated by a blank space, or the full URL to the directory or tar file containing the list of installation packages.

Use the **request system software add set** command to retain any SDK configuration by installing the SDK add-on packages along with the core Junos OS installation package.

unlink—(Optional) On M Series, T Series, and MX Series routers, use the unlink option to remove the software package from this directory after a successful upgrade is completed.

upgrade-group [all | upgrade-group-name]—(Junos Fusion only) (Required to configure a Junos Fusion using autoconversion or manual conversion) Associate a satellite software image with a satellite software upgrade group. The satellite software package is associated with the specified satellite software upgrade group using the *upgrade-group-name*, or for all satellite software upgrade groups in a Junos Fusion when the all keyword is specified.

A satellite software upgrade group is a group of satellite devices in a Junos Fusion that are designated to upgrade to the same satellite software version using the same satellite software package. See *Understanding Software in a Junos Fusion Provider Edge*, *Understanding Software in a Junos Fusion Enterprise*, and *Managing Satellite Software Upgrade Groups in a Junos Fusion*.

upgrade-with-config—(Optional) Install one or more configuration files.



NOTE: Configuration files specified with this option must have the extension **.text** or **.xml** and have the extension specified. Using the extension **.txt** will not work.

validate—(Optional) Validate the software package or bundle against the current configuration as a prerequisite to adding the software package or bundle. This is the default behavior when the software package or bundle being added is a different release.



NOTE: The `validate` option only works on systems that do not have graceful-switchover (GRES) enabled. To use the `validate` option on a system with GRES, either disable GRES for the duration of the installation, or install using the command `request system software in-service-upgrade`, which requires nonstop active routing (NSR) to be enabled when using GRES.

validate-on-host *hostname*—(Optional) Validate the software package by comparing it to the running configuration on a remote Junos OS host. Specify a host, replacing *hostname* with the remote hostname. You can optionally provide the username that will be used to log in to the remote host by specifying the hostname in the format `user@hostname`.

validate-on-routing-engine *routing-engine*—(Optional) Validate the software bundle or package by comparing it to the running configuration on a Junos OS Routing Engine on the same chassis. Specify a Routing Engine, replacing *routing-engine* with the routing engine name.

Additional Information Before upgrading the software on the router or switch, when you have a known stable system, issue the `request system snapshot` command to back up the software, including the configuration, to the `/altroot` and `/altconfig` file systems. After you have upgraded the software on the router or switch and are satisfied that the new package or bundle is successfully installed and running, issue the `request system snapshot` command again to back up the new software to the `/altroot` and `/altconfig` file systems.



NOTE: The `request system snapshot` command is currently not supported on the QFabric system. Also, you cannot add or install multiple packages on a QFabric system.

After you run the `request system snapshot` command, you cannot return to the previous version of the software because the running and backup copies of the software are identical.

If you are upgrading more than one package at the same time, delete the operating system package, `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.

Likewise, when you issue the **request system software add *package-name*** command on a TX Matrix Plus master Routing Engine, all the T1600 or T4000 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix Plus backup Routing Engine, all the T1600 or T4000 backup Routing Engines that are connected to it are upgraded to the same version of software.

When you install a software package and request a system reboot or install a package that requires rebuilding the Junos OS schema, such as an OpenConfig package, devices that use the ephemeral configuration database delete all ephemeral configuration data in the process of rebooting the system or rebuilding the schema. To restore the ephemeral configuration data, you must load and commit the data to the ephemeral database again.

Required Privilege Level

maintenance

Related Documentation

- *Format for Specifying Filenames and URLs in Junos OS CLI Commands*
- *request system software delete*
- *request system software rollback*
- *request system storage cleanup*
- *Installing Software Packages on QFX Devices*
- *Upgrading Software on a QFabric System*
- *Managing Satellite Software Upgrade Groups in a Junos Fusion*
- *request system software add (Maintenance)*
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[request system software add validate on page 193](#)
[request system software add /var/tmp/ no-validate on page 193](#)
[request system software add no-copy no-validate reboot on page 194](#)
[request system software add validate-on-host on page 194](#)
[request system software add \(Mixed EX4200 and EX4500 Virtual Chassis\) on page 195](#)
[request system software add component all \(QFabric Systems\) on page 196](#)
[request system software add upgrade-group \(Junos Fusion\) on page 196](#)

Output Fields

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

Sample Output

request system software add validate

```

user@host> request system software add validate /var/tmp/jinstall-7.2R1.7-domestic-signed.tgz
Checking compatibility with configuration
Initializing...
Using jbase-7.1R2.2
Using /var/tmp/jinstall-7.2R1.7-domestic-signed.tgz
Verified jinstall-7.2R1.7-domestic.tgz signed by PackageProduction_7_2_0
Using /var/validate/tmp/jinstall-signed/jinstall-7.2R1.7-domestic.tgz
Using /var/validate/tmp/jinstall/jbundle-7.2R1.7-domestic.tgz
Checking jbundle requirements on /
Using /var/validate/tmp/jbundle/jbase-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jkernel-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jcrypto-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jpfe-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jdocs-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jroute-7.2R1.7.tgz
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Validating against /config/rescue.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-7.2R1.7-domestic-signed.tgz' ...
Verified jinstall-7.2R1.7-domestic.tgz signed by PackageProduction_7_2_0
Adding jinstall...

WARNING: This package will load JUNOS 7.2R1.7 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-7.2R1.7-domestic-signed.tgz ...
Saving state for rollback ...

```

request system software add /var/tmp/ no-validate

```

user@host> request system software add no-validate
/var/tmp/junos-install-mx-x86-32-15.1R1.9.tgz
Installing package '/var/tmp/junos-install-mx-x86-32-15.1R1.9.tgz' ...
Verified manifest signed by PackageProductionEc_2015
Verified manifest signed by PackageProductionRSA_2015
Verified contents.iso
Verified issu-indb.tgz
Verified junos-x86-32.tgz
Verified kernel

```

```
Verified metatags
Verified package.xml
Verified pkgtools.tgz
camcontrol: not found
camcontrol: not found
Verified manifest signed by PackageProductionEc_2015
Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Saving package file in
/var/sw/pkg/junos-install-x86-32-domestic-20150618.043753_builder_junos_151_r1.tgz
...
Saving state for rollback ...
```

request system software add no-copy no-validate reboot

```
user@host> request system software add no-copy no-validate junos-install-srx-x86-64-17.3R1.tgz
reboot
Verified junos-install-srx-x86-64-17.3R1 signed by PackageProductionEc_2017 method
ECDSA256+SHA256
Verified manifest signed by PackageProductionEc_2017 method ECDSA256+SHA256
Checking PIC combinations
Verified fips-mode signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding fips-mode-x86-32-20170728.153050_builder_junos_173_r1 ...
Verified jail-runtime signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jail-runtime-x86-32-20170725.352915_builder_stable_10 ...
Verified jdocs signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jdocs-x86-32-20170728.153050_builder_junos_173_r1 ...
Verified jfirmware signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jfirmware-x86-32-17.3R1 ...
Verified jpfe-X signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jpfe-X-x86-32-20170728.153050_builder_junos_173_r1 ...
Verified jpfe-X960 signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jpfe-X960-x86-32-20170728.153050_builder_junos_173_r1 ...
Verified jpfe-common signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jpfe-common-x86-32-20170728.153050_builder_junos_173_r1 ...
Verified jpfe-fips signed by PackageProductionEc_2017 method ECDSA256+SHA256
Verified jpfe-wrlinux signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jpfe-wrlinux-x86-32-20170728.153050_builder_junos_173_r1 ...
Verified jsd-jet-1 signed by PackageProductionEc_2017 method ECDSA256+SHA256
Adding jsd-x86-32-17.3R1-jet-1 ...
```

request system software add validate-on-host

```
user@host> request system software add validate-on-host user@xyz
:/var/tmp/jinstall-15.1-20150516_ib_15_2_psd.0-domestic-signed.tgz
user@host> request system software add validate-on-host user@xyz
:/var/tmp/jinstall-15.1-20150516_ib_15_2_psd.0-domestic-signed.tgz
Extracting JUNOS version from package...
Connecting to remote host xyz...
Password:
Sending configuration to xyz...
Validating configuration on xyz...
PACKAGETYPE: not found
Checking compatibility with configuration
Initializing...
Using jbase-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
Using jruntime-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
```

```

Using jkernel-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
Using jroute-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
Using jcrypto-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
Using jweb-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
Using /var/packages/jtools-15.1-20150516_ib_15_2_psd.0
Verified manifest signed by PackageDevelopmentEc_2015
Using /var/tmp/config.tgz
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: warning: schema: init: 'logical-systems-vlans' contains-node 'juniper-config
  vlans': not found
mgd: commit complete
Validation succeeded
Installing package
'/var/tmp/jinstall-15.1-20150516_ib_15_2_psd.0-domestic-signed.tgz' ...
Verified jinstall-15.1-20150516_ib_15_2_psd.0-domestic.tgz signed by
PackageDevelopmentEc_2015
Adding jinstall...

WARNING:    The software that is being installed has limited support.
WARNING:    Run 'file show /etc/notices/unsupported.txt' for details.


WARNING:    This package will load JUNOS 15.1-20150516_ib_15_2_psd.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-15.1-20150516_ib_15_2_psd.0-domestic-signed.tgz ...
Saving state for rollback ...

```

Sample Output

request system software add (Mixed EX4200 and EX4500 Virtual Chassis)

```

user@switch> request system software add set
[/var/tmp/jinstall-ex-4200-11.1R1.1-domestic-signed.tgz
/var/tmp/jinstall-ex-4500-11.1R1.1-domestic-signed.tgz]
...

```

request system software add component all (QFabric Systems)

```
user@switch> request system software add /pbdata/packages/jinstall-qfabric-12.2X50-D1.3.rpm  
component all  
...
```

request system software add upgrade-group (Junos Fusion)

```
user@aggregation-device> request system software add /var/tmp/satellite-3.0R1.1-signed.tgz  
upgrade-group group1
```

request system zeroize

Syntax request system zeroize
 <media>
 <local>

Release Information Command introduced before Junos OS Release 9.0.
 Command introduced in Junos OS Release 11.2 for EX Series switches.
 Option **media** added in Junos OS Release 11.4 for EX Series switches.
 Command introduced in Junos OS Release 12.2 for MX Series routers.
 Command introduced in Junos OS Release 12.3 for the QFX Series.
 Option **local** added in Junos OS Release 14.1.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Remove all configuration information on the Routing Engines and reset all key values on the device where you run the command.

- If the device has dual Routing Engines, the command is broadcast to all Routing Engines on the device.
- In a Virtual Chassis or Virtual Chassis Fabric (VCF) composed of EX Series switches (except EX8200 Virtual Chassis) or QFX Series switches, this command operates only on the member switch where you run the command, even if that switch is in the master Routing Engine role. The command is not forwarded to the backup Routing Engine member or to member switches in the line-card role. To apply this command to more than one member of an EX Series or QFX Series Virtual Chassis or VCF, we recommend you remove and disconnect each of those members from the Virtual Chassis or VCF, and then run the command on each isolated switch individually.

The command removes all data files, including customized configuration and log files, by unlinking the files from their directories. The command removes all user-created files from the system, including all plain-text passwords, secrets, and private keys for SSH, local encryption, local authentication, IPsec, RADIUS, TACACS+, and SNMP.

This command reboots the device and sets it to the factory default configuration. After the reboot, you cannot access the device through the management Ethernet interface. Log in through the console as **root** and start the Junos OS CLI by typing **cli** at the prompt.



NOTE: If the configuration contains the **commit synchronize** statement at the **[edit system]** hierarchy level, and you issue a **commit** in the master Routing Engine, the master configuration is automatically synchronized with the backup. If the backup Routing Engine is down when you issue the **commit**, the Junos OS displays a warning and commits the candidate configuration in the master Routing Engine. When the backup Routing Engine comes up, its configuration will automatically be synchronized with the master. A newly inserted backup Routing Engine or a Routing Engine that comes up after running the **request system zeroize** command also automatically synchronizes its configuration with the master Routing Engine configuration.



NOTE: Starting with Junos OS Release 15.1F3, the `request system zeroize` command removes all configuration information on the guest OS for the PTX5000 router with RE-DUO-C2600-16G, and MX240, MX480, and MX960 with RE-S-1800X4-32G-S.

Starting with Junos OS Release 15.1F5, the `request system zeroize` command removes all configuration information on the guest OS for the MX2010 and MX2020 with REMX2K-1800-32G-S.

On these routers, in order to remove all configuration information on both guest OS and host OS, use the `request vmhost zeroize` command.

To completely erase user-created data so that it is unrecoverable, use the **media** option.

Options **media**—(Optional) In addition to removing all configuration and log files, causes memory and the media to be scrubbed, removing all traces of any user-created files. Every storage device attached to the system is scrubbed, including disks, flash drives, removable USBs, and so on. The duration of the scrubbing process is dependent on the size of the media being erased. As a result, the `request system zeroize media` operation can take considerably more time than the `request system zeroize` operation. However, the critical security parameters are all removed at the beginning of the process.



NOTE: On QFX Series platforms running Junos OS Release 14.1X53 or earlier, the **media** option is not available. On QFX Series platforms running releases later than Junos OS Release 14.1X53 that do not have the upgraded FreeBSD kernel (10+), the **media** option is available, but if you use it, the system will issue a warning that the **media** option is not supported and will continue with the zeroize operation. On platforms that are not QFX Series platforms, the **media** option is not available in Junos OS Release 17.2 or later with Junos with upgraded FreeBSD.

local—(Optional) Remove all the configuration information and restore all the key values on the active Routing Engine.



NOTE: Specifying this option has no effect on switches in a Virtual Chassis or VCF composed of EX Series switches (except EX8200 Virtual Chassis) or QFX switches, because in these configurations, the `request system zeroize` command only operates locally by default.

Required Privilege Level maintenance

Related Documentation

- [request system snapshot on page 174](#)
- *Reverting to the Default Factory Configuration for the EX Series Switch*
- *Reverting to the Rescue Configuration for the EX Series Switch*
- *Reverting to the Default Factory Configuration*
- *Reverting to the Rescue Configuration*
- *Reverting to the Default Factory Configuration by Using the request system zeroize Command*

List of Sample Output [request system zeroize on page 199](#)
[request system zeroize media on page 200](#)

Sample Output

request system zeroize

```

user@host> request system zeroize
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (no) yes

0 1 1 0 0 0 done

syncing disks... All buffers synced.
Uptime: 5d19h20m26s
recorded reboot as normal shutdown
Rebooting...

U-Boot 1.1.6 (Mar 11 2011 - 04:39:06)

Board: EX4200-24T 2.11
EPLD: Version 6.0 (0x85)
DRAM: Initializing (1024 MB)
FLASH: 8 MB

Firmware Version: --- 01.00.00 ---
USB: scanning bus for devices... 2 USB Device(s) found
      scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.4
(user@device.example.net, Fri Mar 11 03:03:36 UTC 2011)
Memory: 1024MB
bootsequencing is enabled
bootsuccess is set
new boot device = disk0s1:
Loading /boot/defaults/loader.conf
/kernel data=0x915c84+0xa1260 syms=[0x4+0x7cbd0+0x4+0xb1c19]

Hit [Enter] to boot immediately, or space bar for command prompt.
```

```

Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
    The Regents of the University of California. All rights reserved.
JUNOS 11.1R1.8 #0: 2011-03-09 20:14:25 UTC

user@device.example.net:/volume/build/junos/11.1/release/11.1R1.8/obj-powerpc/bsd/kernels/
JUNIPER-EX/kernel
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080
...

```

request system zeroize media

```

user@host> request system zeroize media
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (no) yes

warning: ipsec-key-management subsystem not running - not needed by configuration.
warning: zeroizing fpc0

{master:0}
root> Waiting (max 60 seconds) for system process `vnlrn' to stop...done
...
Syncing disks, vnodes remaining...2 4 2 4 3 2 1 1 0 0 0 done

syncing disks... All buffers synced.
Uptime: 14m50s
recorded reboot as normal shutdown
Rebooting...

U-Boot 1.1.6 (Apr 21 2011 - 13:58:42)

Board: EX4200-48PX 1.1
EPLD: Version 8.0 (0x82)
DRAM: Initializing (512 MB)
FLASH: 8 MB
NAND: No NAND device found!!!
0 MiB

Firmware Version: --- 01.00.00 ---
USB: scanning bus for devices... 2 USB Device(s) found
      scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.2
(user@device1.example.com, Fri Feb 26 17:48:51 PST 2010)
Memory: 512MB
Loading /boot/defaults/loader.conf
/kernel data=0x9abfdc+0xb06e4 syms=[0x4+0x83b30+0x4+0xbd7c6]

Hit [Enter] to boot immediately, or space bar for command prompt.

```



```

Booting [/kernel] in 1 second... Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
The Regents of the University of California. All rights reserved.
JUNOS 11.4R1.2 #0: 2011-10-27 18:05:39 UTC
user@device1.example.com:/volume/build/junos/11.4/release/11.4R1.2/obj-powerpc/
bsd/kernels/JUNIPER-EX/kernel
can't re-use a leaf (all_slot_serialid)!
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080<EMCP,TBEN,EN_MAS7_UPDATE>
real memory = 511705088 (488 MB)
avail memory = 500260864 (477 MB)
ETHERNET SOCKET BRIDGE initialising
Initializing EXSERIES platform properties ...
. . .
Automatic reboot in progress...
Media check on da0 on ex platforms
** /dev/da0s2a
FILE SYSTEM CLEAN; SKIPPING CHECKS
clean, 20055 free (31 frags, 2503 blocks, 0.0% fragmentation)
zeroizing /dev/da0s1a ...
. . .
zeroizing /dev/da0s3d ...
. . .
zeroizing /dev/da0s3e ...
. . .
zeroizing /dev/da0s4d ...
. . .
zeroizing /dev/da0s4e ...
. . .

syncing disks... All buffers synced.
Uptime: 3m40s
Rebooting...

U-Boot 1.1.6 (Apr 21 2011 - 13:58:42)

Board: EX4200-48PX 1.1
EPLD: Version 8.0 (0x82)
DRAM: Initializing (512 MB)
FLASH: 8 MB
NAND: No NAND device found!!!
0 MiB

Firmware Version: --- 01.00.00 ---
USB: scanning bus for devices... 2 USB Device(s) found
      scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.2
(user@device1.example.com, Fri Feb 26 17:48:51 PST 2010)
Memory: 512MB

```

```
Loading /boot/defaults/loader.conf
/kernel data=0x9abfdc+0xb06e4 syms=[0x4+0x83b30+0x4+0xbd7c6]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel] in 1 second... Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
The Regents of the University of California. All rights reserved.
JUNOS 11.4R1.2 #0: 2011-10-27 18:05:39 UTC
  user@device1.example.com:/volume/build/junos/11.4/release/11.4R1.2/obj-powerpc/
bsd/kernels/JUNIPER-EX/kernel
can't re-use a leaf (all_slot_serialid)!
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: H1D0 80004080 <EMCP,TBEN,EN_MAS7_UPDATE>
real memory  = 511705088 (488 MB)
avail memory = 500260864 (477 MB)
ETHERNET SOCKET BRIDGE initialising
Initializing EXSERIES platform properties ...
. . .
Automatic reboot in progress...
Media check on da0 on ex platforms
** /dev/da0s1a
FILE SYSTEM CLEAN; SKIPPING CHECKS
clean, 20064 free (48 frags, 2502 blocks, 0.1% fragmentation)
zeroizing /dev/da0s2a ...
. . .
Creating initial configuration...mgd: error: Cannot open configuration file:
/config/juniper.conf
mgd: warning: activating factory configuration
mgd: commit complete
mgd: -----
mgd: Please login as 'root'. No password is required.
mgd: To start Initial Setup, type 'ezsetup' at the JUNOS prompt.
mgd: To start JUNOS CLI, type 'cli' at the JUNOS prompt.
mgd: -----
Setting initial options:  debugger_on_panic=NO debugger_on_break=NO.
Starting optional daemons: .
Doing initial network setup:
. . .

Amnesiac (ttyu0)
```

CHAPTER 12

System Software Monitoring Commands

- show configuration
- show host
- show system commit
- show system configuration archival
- show system configuration rescue
- show system information
- show system processes
- show system queues
- show system reboot
- show system rollback
- show system snapshot
- show system software
- show system statistics
- show system storage
- show system switchover
- show system uptime
- show system virtual-memory
- show task
- show task io
- show task memory
- show task replication
- show version
- start shell
- test configuration

show configuration

Syntax	<code>show configuration</code> <code><statement-path></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the configuration that currently is running on the router or switch, which is the last committed configuration.
Options	<p>none—Display the entire configuration.</p> <p>statement-path—(Optional) Display one of the following hierarchies in a configuration. (Each statement-path option has additional suboptions not described here. See the appropriate feature guide or EX Series switch documentation for more information.)</p> <ul style="list-style-type: none">• access—Network access configuration.• access-profile—Access profile 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.• diameter—Diameter base protocol layer configuration.• ethernet-switching-options—(EX Series switch only) Ethernet switching configuration.• event-options—Event processing configuration.• firewall—Firewall configuration.• forwarding-options—Options that control packet sampling.• groups—Configuration groups.• interfaces—Interface configuration.• jsrc—JSRC partition configuration.• jsrc-partition—JSRC partition configuration.• logical-systems—Logical system configuration.• poe—(EX Series switch only) Power over Ethernet 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.
- **virtual-chassis**—(EX Series switch only) Virtual Chassis configuration.
- **vlan**—(EX Series switch only) VLAN 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.

Likewise, when you issue the **show configuration** command with the **| display set** pipe option to view the configuration as **set** commands, those portions of the configuration that you do not have permissions to view are substituted with the text **ACCESS-DENIED**.

Required Privilege Level view

Related Documentation

- *Displaying the Current Junos OS Configuration*
- *Overview of Junos OS CLI Operational Mode Commands*

List of Sample Output [show configuration on page 205](#)
[show configuration policy-options on page 206](#)

Output Fields This command displays information about the current running configuration.

Sample Output

show configuration

```
user@host> show configuration
## Last commit: 2006-10-31 14:13:00 PST by user1 version "8.2I0 [userb]"; ## last
  changed: 2006-10-31 14:05:53 PST
system {
  host-name exhost;
  domain-name ex1.net;
```

```
    backup-router 198.51.100.254;
    time-zone America/Los_Angeles;
    default-address-selection;
    name-server {
        192.0.2.254;
        192.0.2.249;
        192.0.2.176;
    }
    services {
        telnet;
    }
    tacplus-server {
        10.2.3.4 {
            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 host

Syntax	<code>show host <i>hostname</i></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display Domain Name System (DNS) hostname information.
Options	<i>hostname</i> —Hostname or address.
Additional Information	The <code>show host</code> command displays the raw data received from the DNS server.
Required Privilege Level	view
List of Sample Output	show host on page 207

Sample Output

show host

```
user@host> show host device
device.example.net has address 192.0.2.0

user@host> show host 192.0.2.0
Name: device.example.net
Address: 192.0.2.0
Aliases:
```

show system commit


Syntax	<code>show system commit</code> <code><revision></code> <code><server></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Option server introduced in Junos OS Release 12.1 for the PTX Series router. Option revision introduced in Junos OS Release 14.1. Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Description	Display the system commit history and any pending commit operation.
Options	none —Display the last 50 commit operations listed, most recent to first. revision —(Optional) Display the revision number of the active configuration of the Routing Engine(s). server — (Optional) Display commit server status.
<div>NOTE: By default, the status of the commit server is “Not running”. The commit server starts running only when a commit job is added to the batch.</div>	
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear system commit on page 138• show system commit revision
List of Sample Output	show system commit on page 210 show system commit (At a Particular Time) on page 210 show system commit (At the Next Reboot) on page 210 show system commit (Rollback Pending) on page 210 show system commit (QFX Series) on page 210
Output Fields	Table 6 on page 209 describes the output fields for the show system commit command. Output fields are listed in the approximate order in which they appear.

Table 6: *show system commit* Output Fields

Field Name	Field Description	Level of Output
<number>	Displays the last 50 commit operations listed, most recent to first. The identifier <number> designates a configuration created for recovery using the request system configuration rescue save command.	none
<time-stamp>	Date and time of the commit operation.	none
<root>/<username>	User who executed the commit operation.	none
<method>	Method used to execute the commit operation: <ul style="list-style-type: none"> • CLI—CLI interactive user performed the commit operation. • Junos XML protocol—Junos XML protocol client performed the commit operation. • synchronize—The commit synchronize command was performed on the other Routing Engine. • snmp—An SNMP set request caused the commit operation. • button—A button on the router or switch was pressed to commit a rescue configuration for recovery. • autoinstall—A configuration obtained through autoinstallation was committed. • other—When there is no login name associated with the session, the values for user and client default to root and other. For example, during a reboot after package installation, mgd commits the configuration as a system commit, and there is no login associated with the commit. 	none

Sample Output

show system commit

```
user@host> show system commit
0   2003-07-28 19:14:04 PDT by root via other
1   2003-07-25 22:01:36 PDT by user via cli
2   2003-07-25 22:01:32 PDT by user via cli
3   2003-07-25 21:30:13 PDT by root via button
4   2003-07-25 13:46:48 PDT by user via cli
5   2003-07-25 05:33:21 PDT by root via autoinstall
...
rescue 2002-05-10 15:32:03 PDT by root via other
```

show system commit (At a Particular Time)

```
user@host> show system commit
commit requested by root via cli at Tue May  7 15:59:00 2002
```

show system commit (At the Next Reboot)

```
user@host> show system commit
commit requested by root via cli at reboot
```

show system commit (Rollback Pending)

```
user@host> show system commit
0 2005-01-05 15:00:37 PST by root via cli commit confirmed, rollback in 3mins
```

show system commit (QFX Series)

```
user@switch> show system commit
0 2011-11-25 19:17:49 PST by root via cli
```

show system configuration archival

Syntax show system configuration archival

Release Information Introduced in Junos OS Release 7.6.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display directory and number of files queued for archival transfer.



NOTE: The [edit system configuration] hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

List of Sample Output [show system configuration archival on page 211](#)

Sample Output

show system configuration archival

```
user@host> show system configuration archival
```

```
/var/transfer/config/:
total 8
```

show system configuration rescue

Syntax show system configuration rescue

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
 Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Display a rescue configuration, if one exists.



NOTE: The [edit system configuration] hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation • [show system configuration archival on page 211](#)

List of Sample Output [show system configuration rescue on page 212](#)

Sample Output

show system configuration rescue

```
user@switch> show system configuration rescue
version "7.3"; groups {
  global {
    system {
      host-name router1;
      domain-name customer.net;
      domain-search [ customer.net ];
      backup-router 192.0.2.0;
      name-server {
        192.0.2.11;
        192.0.2.101;
        192.0.2.100;
        192.0.2.10;
      }
    }
  }
  login {
    user user1 {
      uid 928;
      class ;
      shell csh;
      authentication {
        encrypted-password "$ABC123"; ## SECRET-DATA
      }
    }
  }
}
```

```
        }  
    }  
    services {  
        ftp;  
        rlogin;  
        rsh;  
        telnet;  
    }  
}  
}  
....
```

show system information

Syntax `show system information`

Release Information Command introduced in Junos OS Release 17.2.

Description Display high-level system information for the device including the model number, device family, Junos OS release, and hostname.

Options **none**—Display system information for the device.

Required Privilege Level view

Sample Output

show system information

```
user@host> show system information
Model: mx960
Family: junos
Junos: 17.2R1
Hostname: host
```

show system processes

List of Syntax [Syntax on page 215](#)
 [Syntax \(EX Series Switches\) on page 215](#)
 [Syntax \(QFX Series Switches\) on page 215](#)
 [Syntax \(MX Series Routers\) on page 215](#)
 [Syntax \(OCX Series\) on page 215](#)
 [Syntax \(TX Matrix Routers\) on page 216](#)
 [Syntax \(TX Matrix Plus Router\) on page 216](#)

Syntax show system processes
 <brief | detail | extensive | summary>
 <health (pid *process-identifier* | process-name *process-name*)>
 <providers>
 <resource-limits (brief | detail) *process-name*>
 <wide>

Syntax (EX Series Switches) show system processes
 <all-members>
 <brief | detail | extensive | summary>
 <health (pid *process-identifier* | process-name *process-name*)>
 <local>
 <member *member-id*>
 <providers>
 <resource-limits (brief | detail) *process-name*>
 <wide>

Syntax (QFX Series Switches) show system processes
 <all-members>
 <brief | detail | extensive | summary>
 <health (pid *process-identifier* | process-name *process-name*)>
 host-processes (brief|detail)
 <local>
 <member *member-id*>
 <providers>
 <resource-limits (brief | detail) *process-name*>
 <wide>

Syntax (MX Series Routers) show system processes
 <all-members>
 <brief | detail | extensive | summary>
 <health (pid *process-identifier* | process-name *process-name*)>
 <local>
 <member *member-id*>
 <providers>
 <resource-limits (brief | detail) *process-name*>
 <wide>

Syntax (OCX Series) show system processes
 <brief | detail | extensive | summary >
 <health (pid *process-identifier* | process-name *process-name*)>

	<code>host-processes (brief detail)</code> <code><providers></code> <code><resource-limits></code> <code><wide></code>
Syntax (TX Matrix Routers)	<code>show system processes</code> <code><brief detail extensive summary></code> <code><all-chassis all-lcc lcc <i>number</i> scc></code> <code><wide></code>
Syntax (TX Matrix Plus Router)	<code>show system processes</code> <code><brief detail extensive summary></code> <code><all-chassis all-lcc lcc <i>number</i> sfc <i>number</i>></code> <code><wide></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Option sfc introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. Enhanced output regarding per CPU usage introduced in Junos OS Release 16.1R3 for Junos OS with upgraded FreeBSD.
Description	Display information about software processes that are running on the router or switch and that have controlling terminals.
Options	none —Display standard information about system processes. brief detail extensive summary —(Optional) Display the specified level of detail. adaptive-services —(Optional) Display the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC. alarm-control —(Optional) Display the process to configure the system alarm. all-chassis —(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display standard system process information about all the T640 routers (in a routing matrix based on the TX Matrix router) or all the T1600 or T4000 routers (in a routing matrix based on the TX Matrix Plus router) in the chassis. all-lcc —(TX Matrix routers and TX Matrix Plus router only) (Optional) Display standard system process information for all T640 routers (or line-card chassis) connected to the TX Matrix router. Display standard system process information for all connected T1600 or T4000 LCCs. all-members —(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for all members of the Virtual Chassis configuration.

ancpd-service—Display the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

application-identification —Display the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

audit-process—(Optional) Display the RADIUS accounting process.

auto-configuration—Display the Interface Auto-Configuration process.

bootp—Display the process that enables a router, switch, or interface to act as a Dynamic Host Configuration Protocol (DHCP) or bootstrap protocol (BOOTP) relay agent. DHCP relaying is disabled.

captive-portal-content-delivery—Display the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

ce-l2tp-service—(Optional) (M10, M10i, M7i, and MX Series routers only) Display the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

cfm—Display Ethernet Operations, Administration, and Maintenance (OAM) connectivity fault management (CFM) process, which can be used to monitor the physical link between two switches.

chassis-control—(Optional) Display the chassis management process.

class-of-service—(Optional) Display the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.

clksyncd-service—Display the external clock synchronization process, which uses synchronous Ethernet (SyncE).

craft-control—Display the process for the I/O of the craft interface.

database-replication—(EX Series switches and MX Series routers only) (Optional) Display the database replication process.

datapath-trace-service—Display the packet path tracing process.

dhcp-service—(EX Series switches and MX Series routers only) (Optional) Display the Dynamic Host Configuration Protocol process, which enables a DHCP server to allocate network IP addresses and deliver configuration settings to client hosts without user intervention.

diameter-service—(Optional) Display the diameter process.

disk-monitoring—(Optional) Display the disk monitoring process, which checks the health of the hard disk drive on the Routing Engine.

dynamic-flow-capture—(Optional) Display the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

ecc-error-logging—(Optional) Display the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

ethernet-connectivity-fault-management— Display the process that provides IEEE 802.1ag OAM connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

ethernet-link-fault-management—(EX Series switches and MX Series routers only) (Optional) Display the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

event-processing—(Optional) Display the event process (eventd).

firewall—(Optional) Display the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

general-authentication-service—(EX Series switches and MX Series routers only) (Optional) Display the general authentication process.

health (pid *process-identifier* | process-name *process-name*)—(Optional) Display process health information, either by process id (PID) or by process name.

host-processes—Display process information of processes running on the host system.

(On OCX Series only) The following options are available:

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

iccp-service—Display the Inter-Chassis Communication Protocol (ICCP) process.

idp-policy—Display the intrusion detection and prevention (IDP) protocol process.

ilmi—Display the Integrated Local Management Interface (ILMI) protocol process, which provides bidirectional exchange of management information between two ATM interfaces across a physical connection.

inet-process—Display the IP multicast family process.

init—Display the process that initializes the USB modem.

interface-control—(Optional) Display the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

kernel-replication—(Optional) Display the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

l2-learning—(Optional) Display the Layer 2 address flooding and learning process.

l2cpd-service—Display the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

lACP—(Optional) Display the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display standard system process information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display standard system process information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for the local Virtual Chassis member.

local-policy-decision-function—Display the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

logical-system-mux—Display the logical router multiplexer process (lrmuxd), which manages the multiple instances of the routing protocols process (rpd) on a machine running logical routers.

mac-validation—Display the MAC validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

member *member-id*—(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

mib-process—(Optional) Display the MIB II process, which provides the router's MIB II agent.

mobile-ip—(Optional) Display the Mobile IP process, which configures Junos OS Mobile IP features.

moundd-service—(EX Series switches and MX Series routers only) (Optional) Display the service for NFS mounts requests.

mpls-traceroute—(Optional) Display the MPLS Periodic Traceroute process.

mspd—(Optional) Display the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Display the multicast snooping process, which makes Layer 2 devices such as VLAN switches aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Display the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

neighbor-liveness—Display the process, which specifies the maximum length of time that the router waits for its neighbor to re-establish an LDP session.

nfsd-service—(Optional) Display the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

ntp—Display the Network Time Protocol (NTP) process, which provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network.

packet-triggered-subscribers—Display the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

peer-selection-service—(Optional) Display the Peer Selection Service process.

periodic-packet-services—Display the Periodic packet management process, which is responsible for processing a variety of time-sensitive periodic tasks so that other processes can more optimally direct their resources.

pfe—Display the Packet Forwarding Engine management process.

pgcp-service—(Optional) Display the pgcpd service process running on the Routing Engine.

pgm—Display the Pragmatic General Multicast (PGM) protocol process, which enables a reliable transport layer for multicast applications.

pic-services-logging—(Optional) Display the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

ppp—(Optional) Display the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

ppp-service—Display the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

pppoe—(Optional) Display the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

process-monitor—Display the process health monitor process (pmond).

providers—(Optional) Display provider processes.

redundancy-interface-process—(Optional) Display the ASP redundancy process.

remote-operations—(Optional) Display the remote operations process, which provides the ping and traceroute MIBs.

resource-cleanup—Display the resource cleanup process.

resource-limits (brief | detail) process-name—(Optional) Display process resource limits.

routing—(Optional) Display the routing protocol process.

sampling—(Optional) Display the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

sbc-configuration-process—Display the session border controller (SBC) process of the border signaling gateway (BSG).

scc—(TX Matrix routers only) (Optional) Display standard system process information for the TX Matrix router (or switch-card chassis).

sdk-service—Display the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

secure-neighbor-discovery—(EX Series switches and MX Series routers only) (Optional) Display the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

send—(Optional) Display the Secure Neighbor Discovery Protocol (SEND) process, which provides support for protecting Neighbor Discovery Protocol (NDP) messages.

service-deployment—(Optional) Display the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

sfc number—(TX Matrix Plus routers only) (Optional) Display system process information for the TX Matrix Plus router. Replace *number* with 0.

snmp—Display the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

sonet-aps—Display the SONET Automatic Protection Switching (APS) process, which monitors any SONET interface that participates in APS.

static-subscribers—(Optional) Display the Static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

tunnel-oamd—(Optional) Display the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

vrrp—(EX Series switches and MX Series routers only) (Optional) Display the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

watchdog—Display the watchdog timer process, which enables the watchdog timer when Junos OS encounters a problem.

wide—(Optional) Display process information that might be wider than 80 columns.

Additional Information By default, when you issue the **show system processes** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- [List of Junos OS Processes](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show system processes on page 226](#)
[show system processes brief on page 226](#)
[show system processes detail on page 226](#)
[show system processes extensive on page 227](#)
[show system processes extensive \(EX9200 Switch\) on page 227](#)
[show system processes host processes \(OCX1100 Switch\) on page 228](#)
[show system processes lcc wide \(TX Matrix Routing Matrix\) on page 228](#)
[show system processes summary on page 229](#)
[show system processes \(TX Matrix Plus Router\) on page 229](#)
[show system processes sfc \(TX Matrix Plus Router\) on page 237](#)
[show system processes lcc wide \(TX Matrix Plus Routing Matrix\) on page 239](#)
[show system processes \(QFX Series and OCX Series\) on page 241](#)

Output Fields Table 7 on page 223 describes the output fields for the **show system processes** command. Output fields are listed in the approximate order in which they appear.

Table 7: 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
CPU	<p>(For systems running Junos OS with upgraded FreeBSD only) Breakdown of the percent usage on a per-CPU basis into the following categories: % user, % nice, % system, % interrupt, % idle.</p> <p>NOTE: This field shows up in the second frame of output.</p> <p>To see which platforms run Junos OS with upgraded FreeBSD, see <i>Release Information for Junos OS with Upgraded FreeBSD</i>.</p>	extensive
Mem	Information about physical and virtual memory allocation.	brief extensive summary
Active	<p>Memory allocated and actively used by the program.</p> <p>When the system is under memory pressure, the pageout process reuses memory from the free, cache, inact and, if necessary, active pages. When the pageout process runs, it scans memory to see which pages are good candidates to be unmapped and freed up. Thus, the distinction between Active and Inact memory is only used by the pageout process to determine which pool of pages to free first at the time of a memory shortage.</p> <p>The pageout process first scans the Inact list, and checks whether the pages on this list have been accessed since the time they have been listed here. The pages that have been accessed are moved from the Inact list to the Active list. On the other hand, pages that have not been accessed become prime candidates to be freed by the pageout process. If the pageout process cannot produce enough free pages from the Inact list, pages from the Active list get freed up.</p> <p>Because the pageout process runs only when the system is under memory pressure, the pages on the Inact list remain untouched – even if they have not been accessed recently – when the amount of Free memory is adequate.</p>	brief extensive summary
Inact	<p>Memory allocated but not recently used or memory freed by the programs. Inactive memory remains mapped in the address space of one or more processes and, therefore, counts toward the RSS value of those processes.</p> <p>Any amount of memory freed by the routing protocol process might still be considered part of the RES value. Generally, the kernel delays the migrating of memory out of the Inact queue into the Cache or Free list unless there is a memory shortage.</p>	brief extensive summary

Table 7: *show system processes Output Fields (continued)*

Field Name	Field Description	Level of Output
Wired	Memory that is not eligible to be swapped, usually used for in-kernel memory structures and/or memory physically locked by a process.	brief extensive summary
Cache	Memory that is not associated with any program and does not need to be swapped before being reused.	brief extensive summary
Buf	Size of memory buffer used to hold data recently called from the disk.	brief extensive summary
Free	Memory that is not associated with any programs. Memory freed by a process can become Inactive , Cache , or Free , depending on the method used by the process to free the memory.	brief extensive summary
Swap	Information about physical and virtual memory allocation. NOTE: Memory can remain swapped out indefinitely if it is not accessed again. Therefore, the show system process extensive command shows that memory is swapped to disk even though there is plenty of free memory, and such a situation is not unusual.	brief extensive summary
PID	Process identifier.	detail extensive summary
TT	Control terminal name.	none detail
STAT	Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process: <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

Table 7: *show system processes Output Fields (continued)*

Field Name	Field Description	Level of Output
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
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	<p>Current amount of program resident memory, in kilobytes.</p> <p>This is also known as RSS or Resident Set Size. The RES value includes shared library pages used by the process. Any amount of memory freed by the process might still be considered part of the RES value. Generally, the kernel delays the migrating of memory out of the Inact queue into the Cache or Free list unless there is a memory shortage. This can lead to large discrepancies between the values reported by the routing protocol process and the kernel, even after the routing protocol process has freed a large amount of memory.</p>	extensive summary
STATE	Current state of the process (for example, sleep , wait , run , idle , zombie , or stop).	extensive summary
TIME	<p>(S)—Number of system and user CPU seconds that the process has used.</p> <p>(None, D, and E)—Total amount of time that the command has been running.</p>	detail extensive summary
WCPU	Weighted CPU usage.	extensive summary
COMMAND	<p>Command that is currently running.</p> <p>(MX Series routers only) When you display the software processes for an MX Series Virtual Chassis, the show system processes command does not display information about the relayd process.</p>	detail extensive summary
THR	Number of threads in the process	extensive

Sample Output

show system processes

```

user@host> show system processes
PID  TT  STAT      TIME COMMAND
   0  ??  DLs       0:00.70 (swapper)
   1  ??  Is        0:00.35 /sbin/init --
   2  ??  DL        0:00.00 (pagedaemon)
   3  ??  DL        0:00.00 (vmdaemon)
   4  ??  DL        0:42.37 (update)
   5  ??  DL        0:00.00 (if_jnx)
  80  ??  Ss        0:14.66 syslogd -s
  96  ??  Is        0:00.01 portmap
 128  ??  Is        0:02.70 cron
 173  ??  Is        0:02.24 /usr/local/sbin/sshd (sshd1)
 189  ??  S         0:03.80 /sbin/watchdog -t180
 190  ??  I         0:00.03 /usr/sbin/tnetd -N
 191  ??  S         2:24.76 /sbin/ifd -N
 192  ??  S<        0:55.44 /usr/sbin/xntpd -N
 195  ??  S         0:53.11 /usr/sbin/snmpd -N
 196  ??  S         1:15.73 /usr/sbin/mib2d -N
 198  ??  I         0:00.75 /usr/sbin/inetd -N
2677  ??  I         0:00.01 /usr/sbin/mgd -N
2712  ??  Ss        0:00.24 rlogind
2735  ??  R         0:00.00 /bin/ps -ax
1985  p0- S       0:07.41 ./rpd -N
2713  p0  Is        0:00.24 -tcsh (tcsh)
2726  p0  S+        0:00.07 cli

```

show system processes brief

```

user@host> show system processes brief
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

```

show system processes detail

```

user@host> show system processes detail
PID  UID  PPID CPU PRI NI  RSS WCHAN  STARTED  TT  STAT      TIME COMMAND
3151 1049 3129  2  28  0  672 -        1:13PM  p0  R+       0:00.00 ps -ax -r
   1   0   0   0  10  0  376 wait   1:51PM  ??  Is       0:00.29 /sbin/init
   2   0   0   0 -18  0   12 psleep  1:51PM  ??  DL       0:00.00 (pagedae
   3   0   0   0  28  0   12 psleep  1:51PM  ??  DL       0:00.00 (vmdaemo
   4   0   0   0  28  0   12 update  1:51PM  ??  DL       0:07.15 (update)
   5   0   0   0   2  0   12 pfesel  1:51PM  ??  IL       0:02.90 (if_pfe)
  27   0   1   0  10  0 17936 mfsidl  1:51PM  ??  Is       0:00.46 mfs /dev/
  81   0   1   0   2  0   496 select  1:52PM  ??  Ss       0:31.21 syslogd -
 119   1   1   0   2  0   492 select  1:52PM  ??  Is       0:00.00 portmap
 134   0   1   0   2  0   580 select  1:52PM  ??  S        0:02.95 amd -p -a
 151   0   1   0  18  0   532 pause   1:52PM  ??  Is       0:00.34 cron
 183   0   1   0   2  0   420 select  1:52PM  ??  Ss       0:00.07 /usr/loca
 206   0   1   0  18  0   72 pause   1:52PM  ??  S        0:00.51 /sbin/wat
 207   0   1   0   2  0   520 select  1:52PM  ??  I        0:00.16 /usr/sbin
 208   0   1   0   2  0   536 select  1:52PM  ??  S        0:08.21 /sbin/dcd
 210   0   1  255   2 -12   740 select  1:52PM  ??  S<       0:05.83 /usr/sbin

```

```

211  0  1  0  2  0  376 select  1:52PM  ??  S    0:00.03 /usr/sbin
215  0  1  0  2  0  548 select  1:52PM  ??  I    0:00.50 /usr/sbin
219  0  1  0  3  0  540 ttyin   1:52PM  v0  Is+  0:00.02 /usr/libe
220  0  1  0  3  0  540 ttyin   1:52PM  v1  Is+  0:00.01 /usr/libe
221  0  1  0  3  0  540 ttyin   1:52PM  v2  Is+  0:00.01 /usr/libe
222  0  1  0  3  0  540 ttyin   1:52PM  v3  Is+  0:00.01 /usr/libe
735  0  1  0  2  0  468 select  2:47PM  ??  S    0:19.14 /usr/sbin
736  0  1  0  2  0  212 select  2:47PM  ??  S    0:14.13 /usr/sbin
1380 0  1  0  3  0  888 ttyin   7:32PM  d0  Is+  0:00.46 bash
3019 0 207  0  2  0  636 select 10:49AM  ??  Ss   0:02.93 tnp.chass
3122 0 1380 0  2  0 1764 select 12:33PM  d0  S    0:00.77 ./rpd -N
3128 0 215  0  2  0  580 select 12:45PM  ??  Ss   0:00.12 rlogind
3129 1049 3128 0 18 0 944 pause 12:45PM  p0  Ss   0:00.14 -tcsh (tc
      0  0  0  0 -18 0  0 sched  1:51PM  ??  DLs  0:00.10 (swapper

```

show system processes extensive

```
user@host> show system processes extensive
```

```
Mem: 241M Active, 99M Inact, 78M Wired, 325M Cache, 69M Buf, 1251M Free
Swap: 2048M Total, 2048M Free
```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	COMMAND
11	root	1	171	52	OK	12K	RUN	807.5H	98.73%	idle
13	root	1	-20	-139	OK	12K	WAIT	36:17	0.00%	swi7: clock sio
1499	root	1	96	0	7212K	3040K	select	34:01	0.00%	license-check
1621	root	1	96	0	20968K	11216K	select	20:25	0.00%	mib2d
1465	root	2	8	-88	115M	11748K	nanslp	14:32	0.00%	chassisd
1478	root	1	96	0	6336K	3816K	select	11:28	0.00%	ppmd
20	root	1	-68	-187	OK	12K	WAIT	10:28	0.00%	irq10: em0 em1+++*
1490	root	1	96	0	11792K	4336K	select	9:44	0.00%	shm-rtssdbd
1618	root	1	96	0	39584K	7464K	select	8:47	0.00%	pfed
1622	root	1	96	0	15268K	10988K	select	6:16	0.00%	snmpd
1466	root	1	96	0	7408K	2896K	select	5:44	0.00%	alarmd
7	root	1	-16	0	OK	12K	client	5:09	0.00%	ifstate notify
1480	root	1	96	0	5388K	2660K	select	4:29	0.00%	ksyncd
12	root	1	-40	-159	OK	12K	WAIT	4:15	0.00%	swi2: netisr 0
1462	root	1	96	0	1836K	1240K	select	3:57	0.00%	bslockd
55	root	1	-16	0	OK	12K	-	3:44	0.00%	schedcpu
1392	root	1	16	0	OK	12K	bcmsem	3:37	0.00%	bcmLINK.0
47	root	1	-16	0	OK	12K	psleep	3:25	0.00%	vmkmemdaemon
36	root	1	20	0	OK	12K	syncer	2:46	0.00%	syncer
1484	root	1	96	0	7484K	3428K	select	2:38	0.00%	clksyncd
1616	root	1	96	0	4848K	2848K	select	2:18	0.00%	irsd
1487	root	1	96	0	32800K	6992K	select	2:10	0.00%	smid
1623	root	1	96	0	34616K	5464K	select	2:01	0.00%	dcd
15	root	1	-16	0	OK	12K	-	1:59	0.00%	yarrow
49	root	1	-16	0	OK	12K	.	1:51	0.00%	ddostasks

show system processes extensive (EX9200 Switch)

```
user@switch> show system processes extensive
```

```
last pid: 3372; load averages: 0.02, 0.02, 0.00 up 0+01:42:22 16:39:57
151 processes: 4 running, 131 sleeping, 1 zombie, 15 waiting
```

```
Mem: 935M Active, 122M Inact, 108M Wired, 838M Cache, 214M Buf, 5872M Free
Swap: 8192M Total, 8192M Free
```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	COMMAND
-----	----------	-----	-----	------	------	-----	-------	------	------	---------

```

10 root      1 171  52    OK    16K RUN    96:34 92.19% idle
3317 root    1  97   0 40412K 30944K select 0:00  5.13% mgd
3316 root    1  96   0 26672K 20516K select 0:00  3.08% cli
1626 root    2   8  -88   124M 20332K nanslp  3:19  2.39% chassisd
260 root     1  -8   0    OK    16K mdwait 0:16  0.00% md16
19 root     1 -68 -187   OK    16K WAIT   0:12  0.00% irq11: em0 em1
em2*
1642 root    1  96   0  8052K 3936K RUN    0:10  0.00% clksyncd
11 root     1 -20 -139   OK    16K WAIT   0:07  0.00% swi7: clock sio
154 root     1  -8   0    OK    16K mdwait 0:06  0.00% md8
1784 root    1  96   0   98M 33720K select 0:05  0.00% authd
1646 root    1  96   0  7776K 2944K select 0:03  0.00% license-check
1807 root    1  96   0 41340K 9944K select 0:02  0.00% mib2d

```

[...Output truncated...]

show system processes host processes (OCX1100 Switch)

```

user@switch> show system processes host processes
fpc0:
-----
top - 14:14:32 up  2:05,  0 users,  load average: 0.11, 0.39, 0.39
Tasks: 101 total,  1 running, 98 sleeping,  0 stopped,  2 zombie
Cpu(s):  3.1%us,  2.2%sy,  0.0%ni, 94.2%id,  0.4%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:   3881300k total, 2667040k used, 1214260k free,  53232k buffers
Swap:   15620k total,    0k used,  15620k free,  808492k cached

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
 2780 root       20   0 1860m 1.5g 3780  S   14  41.7   20:56.05  kvm
 1482 bind       20   0 24676 5912 1944  S    2   0.2    0:00.07  named
 4631 root       20   0  648m  94m  13m  S    2   2.5    4:19.59  dcpfe
 9230 root       20   0 15208 1092  832  R    2   0.0    0:00.01  top
   1 root       20   0  4216  660  576  S    0   0.0    2:09.61  init
   2 root       20   0     0     0     0  S    0   0.0    0:00.00  kthreadd
   3 root       20   0     0     0     0  S    0   0.0    0:00.21  ksoftirqd/0
   4 root       20   0     0     0     0  S    0   0.0    0:00.00  kworker/0:0
   5 root        0 -20     0     0     0  S    0   0.0    0:00.00  kworker/0:0H
   7 root       RT   0     0     0     0  S    0   0.0    0:00.52  migration/0
   8 root       20   0     0     0     0  S    0   0.0    0:04.36  rcu_preempt
   9 root       20   0     0     0     0  S    0   0.0    0:00.00  rcu_bh
  10 root       20   0     0     0     0  S    0   0.0    0:00.00  rcu_sched
  11 root       RT   0     0     0     0  S    0   0.0    0:00.53  migration/1

```

[...Output truncated...]

show system processes lcc wide (TX Matrix Routing Matrix)

```

user@host> show system processes lcc 2 wide
lcc2-re0:
-----
  PID  TT  STAT      TIME  COMMAND
    0  ??  DLs      0:00.00  (swapper)
    1  ??  ILs      0:00.10  /sbin/preinit -- (init)
    2  ??  DL       0:00.00  (pagedaemon)
    3  ??  DL       0:00.00  (vmdaemon)
    4  ??  DL       0:00.00  (bufdaemon)
    5  ??  DL       0:00.04  (syncer)
    6  ??  DL       0:00.00  (netdaemon)
    7  ??  IL       0:00.00  (if_pic_listen)
    8  ??  IL       0:00.00  (scs_housekeeping)

```

```

    9  ??  IL    0:00.00  (if_pfe_listen)
   10  ??  DL    0:00.00  (vmuncachedaemon)
   11  ??  SL    0:00.02  (cb_poll)
  172  ??  ILs   0:00.21  mfs -o noauto /dev/ad1s1b /tmp (newfs)
2909  ??  Is    0:00.00  pccardd
2932  ??  Ss    0:00.07  syslogd -r -s
3039  ??  Is    0:00.00  cron
3217  ??  I     0:00.00  /sbin/watchdog -d
3218  ??  I     0:00.02  /usr/sbin/tnetd -N
3221  ??  S     0:00.11  /usr/sbin/alarmd -N
3222  ??  S     0:00.85  /usr/sbin/craftd -N
3223  ??  S     0:00.05  /usr/sbin/mgd -N
3224  ??  I     0:00.02  /usr/sbin/inetd -N
3225  ??  I     0:00.00  /usr/sbin/tnp.snptd -N
3226  ??  I     0:00.01  /usr/sbin/tnp.snptc -N
3228  ??  I     0:00.01  /usr/sbin/smartd -N
3231  ??  I     0:00.01  /usr/sbin/eccd -N
3425  ??  S     0:00.09  /usr/sbin/dfwd -N
3426  ??  S     0:00.19  /sbin/dcd -N
3427  ??  I     0:00.04  /usr/sbin/pfed -N
3430  ??  S     0:00.10  /usr/sbin/ksyncd -N
3482  ??  S     1:53.63  /usr/sbin/chassisd -N
4285  ??  SL    0:00.01  (peer proxy)
4286  ??  SL    0:00.00  (peer proxy)
4303  ??  Ss    0:00.00  mgd: (mgd) (root) (mgd)
4304  ??  R     0:00.00  /bin/ps -ax -ww
3270  d0  Is+   0:00.00  /usr/libexec/getty std.9600 ttyd0

```

show system processes summary

```

user@host> show system processes summary
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

```

```

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

```

PID	USERNAME	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	CPU	COMMAND
527	root	2	0	176K	580K	select	0:00	0.04%	0.04%	rlogind
543	root	30	0	604K	768K	RUN	0:00	0.00%	0.00%	top

show system processes (TX Matrix Plus Router)

```

user@host> show system processes
sfc0-re0:

```

```

-----
PID  TT  STAT      TIME COMMAND
  0  ??  WLS    0:00.00 [swapper]
  1  ??  ILs    0:00.18 /packages/mnt/jbase/sbin/init --
  2  ??  DL     0:00.20 [g_event]
  3  ??  DL     0:00.39 [g_up]
  4  ??  DL     0:00.32 [g_down]
  5  ??  DL     0:00.00 [thread taskq]
  6  ??  DL     0:00.09 [kqueue taskq]
  7  ??  DL     0:00.01 [pagedaemon]
  8  ??  DL     0:00.00 [vmdaemon]
  9  ??  DL     0:06.63 [pagezero]
 10  ??  DL     0:00.00 [ktrace]
 11  ??  RL    310:52.98 [idle]
 12  ??  WL     0:11.03 [swi2: net]

```

```

13 ?? WL 0:27.58 [swi7: clock sio]
14 ?? WL 0:00.00 [swi6: vm]
15 ?? DL 0:03.02 [yarrow]
16 ?? WL 0:00.00 [swi9: +]
17 ?? WL 0:00.00 [swi8: +]
18 ?? WL 0:00.00 [swi5: cambio]
19 ?? WL 0:00.00 [swi9: task queue]
20 ?? WL 0:11.41 [irq16: uhci0 uhci*]
21 ?? DL 0:00.00 [usb0]
22 ?? DL 0:00.00 [usbtask]
23 ?? WL 0:39.51 [irq17: uhci1 uhci*]
24 ?? DL 0:00.00 [usb1]
25 ?? WL 0:00.00 [irq18: uhci2 uhci*]
26 ?? DL 0:00.83 [usb2]
27 ?? DL 0:00.00 [usb3]
28 ?? DL 0:00.00 [usb4]
29 ?? DL 0:00.00 [usb5]
30 ?? DL 0:00.73 [usb6]
31 ?? DL 0:00.00 [usb7]
32 ?? WL 0:00.00 [irq14: ata0]
33 ?? WL 0:00.00 [irq15: ata1]
34 ?? WL 0:00.00 [irq1: atkbd0]
35 ?? WL 0:00.00 [swi0: sio]
36 ?? WL 0:00.00 [irq11: isab0]
37 ?? WL 0:00.00 [swi3: ip6opt ipopt]
38 ?? WL 0:00.00 [swi4: ip6mismatch+]
39 ?? WL 0:00.00 [swi1: ipfwd]
40 ?? DL 0:00.02 [bufdaemon]
41 ?? DL 0:00.02 [vn1ru]
42 ?? DL 0:00.39 [syncer]
43 ?? DL 0:00.05 [softdepflush]
44 ?? DL 0:00.00 [netdaemon]
45 ?? DL 0:00.02 [vmuncachedaemon]
46 ?? DL 0:00.00 [if_pic_listen]
47 ?? DL 0:00.35 [vmkmemdaemon]
48 ?? DL 0:00.00 [cb_poll]
49 ?? DL 0:00.06 [if_pfe_listen]
50 ?? DL 0:00.00 [scs_housekeeping]
51 ?? IL 0:00.00 [kern_dump_proc]
52 ?? IL 0:00.00 [nfsiod 0]
53 ?? IL 0:00.00 [nfsiod 1]
54 ?? IL 0:00.00 [nfsiod 2]
55 ?? IL 0:00.00 [nfsiod 3]
56 ?? DL 0:00.37 [schedcpu]
57 ?? DL 0:00.56 [md0]
79 ?? DL 0:02.58 [md1]
100 ?? DL 0:00.03 [md2]
118 ?? DL 0:00.01 [md3]
139 ?? DL 0:00.95 [md4]
160 ?? DL 0:00.12 [md5]
181 ?? DL 0:00.00 [md6]
217 ?? DL 0:00.02 [md7]
227 ?? DL 0:00.05 [md8]
1341 ?? SL 0:01.34 [bcmTX]
1342 ?? SL 0:01.68 [bcmXGS3AsyncTX]
1343 ?? SL 0:41.40 [bcmLINK.0]
1345 ?? SL 0:33.83 [bcmLINK.1]
1350 ?? Is 0:00.01 /usr/sbin/cron
1502 ?? S 0:00.01 /sbin/watchdog -t-1
1503 ?? S 0:00.86 /usr/libexec/bslockd -mp -N
1504 ?? S 0:00.01 /usr/sbin/tnetd -N

```

```

1507 ?? S      0:01.32 /usr/sbin/alarmd -N
1508 ?? S      0:14.54 /usr/sbin/craftd -N
1509 ?? S      0:01.19 /usr/sbin/mgd -N
1512 ?? I      0:00.05 /usr/sbin/inetd -N
1513 ?? S      0:00.10 /usr/sbin/tnp.snptd -N
1517 ?? S      0:00.11 /usr/sbin/smartd -N
1525 ?? S      0:01.10 /usr/sbin/idpd -N
1526 ?? S      0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
1527 ?? I      0:00.01 /usr/libexec/getty Pc ttyv0
1616 ?? DL     0:00.30 [peer proxy]
1617 ?? DL     0:00.32 [peer proxy]
1618 ?? DL     0:00.34 [peer proxy]
1619 ?? DL     0:00.30 [peer proxy]
2391 ?? Is     0:00.01 telnetd
7331 ?? Ss     0:00.03 telnetd
9538 ?? DL     0:01.16 [jsr_kkcm]
9613 ?? DL     0:00.18 [peer proxy]
23781 ?? Ss    0:00.01 telnetd
23926 ?? Ss    0:00.01 mgd: (mgd) (user)/dev/tty2 (mgd)
36867 ?? S      0:03.14 /usr/sbin/rpd -N
36874 ?? S      0:00.08 /usr/sbin/lmpd
36876 ?? S      0:00.17 /usr/sbin/lacpd -N
36877 ?? S      0:00.15 /usr/sbin/bfdd -N
36878 ?? S      0:05.05 /usr/sbin/ppmd -N
36907 ?? S      0:25.07 /usr/sbin/chassisd -N
37775 ?? S      0:00.01 /usr/sbin/bdbrepd -N
45727 ?? S      0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729 ?? S      0:00.38 /usr/sbin/l2ald -N
45730 ?? S<    0:00.12 /usr/sbin/apspd -N
45731 ?? SN     0:00.10 /usr/sbin/sampled -N
45732 ?? S      0:00.03 /usr/sbin/ilmid -N
45733 ?? S      0:00.09 /usr/sbin/rmopd -N
45734 ?? S      0:00.30 /usr/sbin/cosd
45735 ?? I      0:00.00 /usr/sbin/rtspd -N
45736 ?? S      0:00.06 /usr/sbin/fsad -N
45737 ?? S      0:00.05 /usr/sbin/rdd -N
45738 ?? S      0:00.10 /usr/sbin/pppd -N
45739 ?? S      0:00.05 /usr/sbin/dfcd -N
45740 ?? S      0:00.07 /usr/sbin/lfmd -N
45741 ?? S      0:00.01 /usr/sbin/mpiisoamd -N
45742 ?? I      0:00.01 /usr/sbin/sendd -N
45743 ?? S      0:00.08 /usr/sbin/appidd -N
45744 ?? S      0:00.05 /usr/sbin/mspd -N
45745 ?? S      0:00.25 /usr/sbin/jdiameterd -N
45746 ?? S      0:00.10 /usr/sbin/pfed -N
45747 ?? S      0:00.19 /usr/sbin/lpdfd -N
45748 ?? S      0:00.63 /sbin/dcd -N
45750 ?? S      0:00.45 /usr/sbin/mib2d -N
45751 ?? S      0:00.15 /usr/sbin/dfwd -N
45752 ?? S      0:00.15 /usr/sbin/irsd -N
45764 ?? S      0:20.59 /usr/sbin/snmpd -N
56479 ?? Ss    0:00.00 mgd: (mgd) (root) (mgd)
56480 ?? R      0:00.00 /bin/ps -ax
1142 d0- I      0:00.01 /usr/sbin/usbd -N
1160 d0- S      0:29.17 /usr/sbin/eventd -N -r -s -A
6527 d0 Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
2392 p1 Is     0:00.00 login [pam] (login)
2393 p1 I       0:00.00 -csh (csh)
2394 p1 I       0:00.00 su -
2395 p1 I+      0:00.01 -su (csh)
23782 p2 Is     0:00.00 login [pam] (login)

```

```

23881 p2 I      0:00.00 -csh (csh)
23925 p2 S+    0:00.03 cli
7332  p3 Is    0:00.00 login [pam] (login)
7333  p3 I      0:00.00 -csh (csh)
23780 p3 S+    0:00.02 telnet aj

```

```
lcc0-re0:
```

```

-----
PID  TT  STAT      TIME COMMAND
 0  ??  Wls    0:00.00 [swapper]
 1  ??  ILs    0:00.16 /packages/mnt/jbase/sbin/init --
 2  ??  DL     0:00.01 [g_event]
 3  ??  DL     0:00.16 [g_up]
 4  ??  DL     0:00.11 [g_down]
 5  ??  DL     0:00.00 [thread taskq]
 6  ??  DL     0:00.00 [kqueue taskq]
 7  ??  DL     0:00.00 [pagedaemon]
 8  ??  DL     0:00.00 [vmdaemon]
 9  ??  DL     0:01.77 [pagezero]
10  ??  DL     0:00.00 [ktrace]
11  ??  RL    17:22.31 [idle]
12  ??  WL     0:00.32 [swi2: net]
13  ??  WL     0:01.21 [swi7: clock sio]
14  ??  WL     0:00.00 [swi6: vm]
15  ??  DL     0:00.10 [yarrow]
16  ??  WL     0:00.00 [swi9: +]
17  ??  WL     0:00.00 [swi8: +]
18  ??  WL     0:00.00 [swi5: cambio]
19  ??  WL     0:00.00 [swi9: task queue]
20  ??  WL     0:02.73 [irq10: bcm0 uhci1*]
21  ??  WL     0:00.02 [irq11: cb0 uhci0+*]
22  ??  DL     0:00.00 [usb0]
23  ??  DL     0:00.00 [usbtask]
24  ??  DL     0:00.00 [usb1]
25  ??  DL     0:00.05 [usb2]
26  ??  DL     0:00.00 [usb3]
27  ??  DL     0:00.00 [usb4]
28  ??  DL     0:00.00 [usb5]
29  ??  DL     0:00.04 [usb6]
30  ??  DL     0:00.00 [usb7]
31  ??  WL     0:00.00 [irq14: ata0]
32  ??  WL     0:00.00 [irq15: ata1]
33  ??  WL     0:00.00 [irq1: atkbd0]
34  ??  WL     0:00.00 [swi0: sio]
35  ??  WL     0:00.00 [swi3: ip6opt ipopt]
36  ??  WL     0:00.00 [swi4: ip6mismatch+]
37  ??  WL     0:00.00 [swi1: ipfwd]
38  ??  DL     0:00.00 [bufdaemon]
39  ??  DL     0:00.00 [vn1ru]
40  ??  DL     0:00.01 [syncer]
41  ??  DL     0:00.00 [softdepflush]
42  ??  DL     0:00.00 [netdaemon]
43  ??  DL     0:00.00 [vmuncachedaemon]
44  ??  DL     0:00.00 [if_pic_listen]
45  ??  DL     0:00.02 [vmkmemdaemon]
46  ??  DL     0:00.01 [cb_poll]
47  ??  DL     0:00.00 [if_pfe_listen]
48  ??  DL     0:00.00 [scs_housekeeping]
49  ??  IL     0:00.00 [kern_dump_proc]
50  ??  IL     0:00.00 [nfsiod 0]
51  ??  IL     0:00.00 [nfsiod 1]

```



```

52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.01 [schedcpu]
55 ?? DL 0:00.73 [md0]
77 ?? DL 0:03.54 [md1]
98 ?? DL 0:00.37 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1078 ?? DL 0:00.00 [jsr_kkcm]
1363 ?? SL 0:00.09 [bcmTX]
1364 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1365 ?? SL 0:03.08 [bcmLINK.0]
1370 ?? Is 0:00.00 /usr/sbin/cron
1522 ?? S 0:00.00 /sbin/watchdog -t-1
1523 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1524 ?? I 0:00.01 /usr/sbin/tnetd -N
1526 ?? S 0:04.98 /usr/sbin/chassisd -N
1527 ?? S 0:00.04 /usr/sbin/alarmd -N
1528 ?? I 0:00.40 /usr/sbin/craftd -N
1529 ?? S 0:00.08 /usr/sbin/mgd -N
1532 ?? I 0:00.04 /usr/sbin/inetd -N
1533 ?? I 0:00.00 /usr/sbin/tnp.snptd -N
1534 ?? I 0:00.00 /usr/sbin/tnp.snptc -N
1536 ?? S 0:00.01 /usr/sbin/smartd -N
1540 ?? I 0:00.07 /usr/sbin/jcsd -N
1541 ?? S 0:00.11 /usr/sbin/idpd -N
1542 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2089 ?? DL 0:00.01 [peer proxy]
2090 ?? DL 0:00.01 [peer proxy]
2091 ?? DL 0:00.01 [peer proxy]
2657 ?? S 0:00.02 /usr/sbin/dfwd -N
2658 ?? S 0:00.02 /sbin/dcd -N
2659 ?? S 0:00.05 /usr/sbin/snmpd -N
2660 ?? S 0:00.01 /usr/sbin/mib2d -N
2661 ?? S 0:00.01 /usr/sbin/pfed -N
2662 ?? S 0:00.01 /usr/sbin/irsd -N
2667 ?? S 0:00.13 /usr/sbin/ksyncd -N
2690 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
2691 ?? R 0:00.00 /bin/ps -ax
1164 d0- S 0:00.00 /usr/sbin/usbd -N
1182 d0- S 0:00.34 /usr/sbin/eventd -N -r -s -A
1543 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0

```

lcc1-re0:

```

-----
PID TT STAT TIME COMMAND
0 ?? Wls 0:00.00 [swapper]
1 ?? ILs 0:00.17 /packages/mnt/jbase/sbin/init --
2 ?? DL 0:00.01 [g_event]
3 ?? DL 0:00.16 [g_up]
4 ?? DL 0:00.11 [g_down]
5 ?? DL 0:00.00 [thread taskq]
6 ?? DL 0:00.00 [kqueue taskq]
7 ?? DL 0:00.00 [pagedaemon]
8 ?? DL 0:00.00 [vmdaemon]
9 ?? DL 0:01.77 [pagezero]
10 ?? DL 0:00.00 [ktrace]

```

```

11 ?? RL 17:22.83 [idle]
12 ?? WL 0:00.35 [swi2: net]
13 ?? WL 0:01.20 [swi7: clock sio]
14 ?? WL 0:00.00 [swi6: vm]
15 ?? DL 0:00.10 [yarrow]
16 ?? WL 0:00.00 [swi9: +]
17 ?? WL 0:00.00 [swi8: +]
18 ?? WL 0:00.00 [swi5: cambio]
19 ?? WL 0:00.00 [swi9: task queue]
20 ?? WL 0:02.87 [irq10: bcm0 uhci1*]
21 ?? WL 0:00.02 [irq11: cb0 uhci0+*]
22 ?? DL 0:00.00 [usb0]
23 ?? DL 0:00.00 [usbtask]
24 ?? DL 0:00.00 [usb1]
25 ?? DL 0:00.05 [usb2]
26 ?? DL 0:00.00 [usb3]
27 ?? DL 0:00.00 [usb4]
28 ?? DL 0:00.00 [usb5]
29 ?? DL 0:00.04 [usb6]
30 ?? DL 0:00.00 [usb7]
31 ?? WL 0:00.00 [irq14: ata0]
32 ?? WL 0:00.00 [irq15: ata1]
33 ?? WL 0:00.00 [irq1: atkbd0]
34 ?? WL 0:00.00 [swi0: sio]
35 ?? WL 0:00.00 [swi3: ip6opt ipopt]
36 ?? WL 0:00.00 [swi4: ip6mismatch+]
37 ?? WL 0:00.00 [swi1: ipfwd]
38 ?? DL 0:00.00 [bufdaemon]
39 ?? DL 0:00.00 [vn1ru]
40 ?? DL 0:00.01 [syncer]
41 ?? DL 0:00.00 [softdepflush]
42 ?? DL 0:00.00 [netdaemon]
43 ?? DL 0:00.00 [vmuncachedaemon]
44 ?? DL 0:00.00 [if_pic_listen]
45 ?? DL 0:00.02 [vmkmemdaemon]
46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]
51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.02 [schedcpu]
55 ?? DL 0:00.75 [md0]
77 ?? DL 0:03.40 [md1]
98 ?? DL 0:00.37 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1052 ?? DL 0:00.00 [jsr_kkcm]
1337 ?? SL 0:00.09 [bcmTX]
1338 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1339 ?? SL 0:03.10 [bcmLINK.0]
1344 ?? Is 0:00.00 /usr/sbin/cron
1496 ?? S 0:00.00 /sbin/watchdog -t-1
1497 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1498 ?? I 0:00.01 /usr/sbin/tnetd -N

```

```

1500 ?? S      0:04.97 /usr/sbin/chassisd -N
1501 ?? S      0:00.04 /usr/sbin/alarmd -N
1502 ?? I      0:00.40 /usr/sbin/craftd -N
1503 ?? S      0:00.08 /usr/sbin/mgd -N
1506 ?? I      0:00.04 /usr/sbin/inetd -N
1507 ?? I      0:00.00 /usr/sbin/tnp.snmpd -N
1508 ?? I      0:00.00 /usr/sbin/tnp.sntpd -N
1510 ?? S      0:00.01 /usr/sbin/smartd -N
1514 ?? I      0:00.07 /usr/sbin/jcsd -N
1515 ?? S      0:00.18 /usr/sbin/idpd -N
1516 ?? I      0:00.00 /usr/libexec/getty Pc ttyv0
2068 ?? DL     0:00.01 [peer proxy]
2069 ?? DL     0:00.01 [peer proxy]
2070 ?? DL     0:00.01 [peer proxy]
2666 ?? S      0:00.02 /sbin/dcd -N
2667 ?? S      0:00.01 /usr/sbin/irsd -N
2668 ?? S      0:00.01 /usr/sbin/pfed -N
2669 ?? S      0:00.05 /usr/sbin/snmpd -N
2670 ?? S      0:00.01 /usr/sbin/mib2d -N
2671 ?? S      0:00.02 /usr/sbin/dfwd -N
2675 ?? S      0:00.13 /usr/sbin/ksyncd -N
2699 ?? Ss     0:00.00 mgd: (mgd) (root) (mgd)
2700 ?? R      0:00.00 /bin/ps -ax
1138 d0- S     0:00.00 /usr/sbin/usbd -N
1156 d0- S     0:00.37 /usr/sbin/eventd -N -r -s -A
1517 d0 Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0

```

lcc2-re0:

```

-----
PID TT  STAT      TIME COMMAND
  0 ??  Wls      0:00.00 [swapper]
  1 ??  ILs      0:00.18 /packages/mnt/jbase/sbin/init --
  2 ??  DL        0:00.01 [g_event]
  3 ??  DL        0:00.17 [g_up]
  4 ??  DL        0:00.12 [g_down]
  5 ??  DL        0:00.00 [thread taskq]
  6 ??  DL        0:00.00 [kqueue taskq]
  7 ??  DL        0:00.00 [pagedaemon]
  8 ??  DL        0:00.00 [vmdaemon]
  9 ??  DL        0:01.77 [pagezero]
 10 ??  DL        0:00.00 [ktrace]
 11 ??  RL      17:19.13 [idle]
 12 ??  WL        0:00.36 [swi2: net]
 13 ??  WL        0:01.20 [swi7: clock sio]
 14 ??  WL        0:00.00 [swi6: vm]
 15 ??  DL        0:00.13 [yarrow]
 16 ??  WL        0:00.00 [swi9: +]
 17 ??  WL        0:00.00 [swi8: +]
 18 ??  WL        0:00.00 [swi5: cambio]
 19 ??  WL        0:00.00 [swi9: task queue]
 20 ??  WL        0:03.03 [irq10: bcm0 uhci1*]
 21 ??  WL        0:00.02 [irq11: cb0 uhci0+*]
 22 ??  DL        0:00.00 [usb0]
 23 ??  DL        0:00.00 [usbtask]
 24 ??  DL        0:00.00 [usb1]
 25 ??  DL        0:00.05 [usb2]
 26 ??  DL        0:00.00 [usb3]
 27 ??  DL        0:00.00 [usb4]
 28 ??  DL        0:00.00 [usb5]
 29 ??  DL        0:00.04 [usb6]
 30 ??  DL        0:00.00 [usb7]

```

```

31 ?? WL 0:00.00 [irq14: ata0]
32 ?? WL 0:00.00 [irq15: ata1]
33 ?? WL 0:00.00 [irq1: atkbd0]
34 ?? WL 0:00.00 [swi0: sio]
35 ?? WL 0:00.00 [swi3: ip6opt ipopt]
36 ?? WL 0:00.00 [swi4: ip6mismatch+]
37 ?? WL 0:00.00 [swi1: ipfwd]
38 ?? DL 0:00.00 [bufdaemon]
39 ?? DL 0:00.00 [vn1ru]
40 ?? DL 0:00.01 [syncer]
41 ?? DL 0:00.00 [softdepflush]
42 ?? DL 0:00.00 [netdaemon]
43 ?? DL 0:00.00 [vmuncachedaemon]
44 ?? DL 0:00.00 [if_pic_listen]
45 ?? DL 0:00.02 [vmkmemdaemon]
46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]
51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.02 [schedcpu]
55 ?? DL 0:00.75 [md0]
77 ?? DL 0:03.48 [md1]
98 ?? DL 0:00.59 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1052 ?? DL 0:00.00 [jsr_kkcm]
1337 ?? SL 0:00.09 [bcmTX]
1338 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1339 ?? SL 0:03.22 [bcmLINK.0]
1344 ?? Is 0:00.00 /usr/sbin/cron
1496 ?? S 0:00.00 /sbin/watchdog -t-1
1497 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1498 ?? S 0:00.01 /usr/sbin/tnetd -N
1500 ?? R 0:05.17 /usr/sbin/chassisd -N
1501 ?? S 0:00.04 /usr/sbin/alarmd -N
1502 ?? I 0:00.39 /usr/sbin/craftd -N
1503 ?? S 0:00.08 /usr/sbin/mgd -N
1506 ?? I 0:00.05 /usr/sbin/inetd -N
1507 ?? I 0:00.00 /usr/sbin/tnp.snptd -N
1508 ?? I 0:00.00 /usr/sbin/tnp.snptc -N
1510 ?? S 0:00.01 /usr/sbin/smartd -N
1514 ?? I 0:00.07 /usr/sbin/jcsd -N
1515 ?? S 0:00.17 /usr/sbin/idpd -N
1516 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2591 ?? DL 0:00.01 [peer proxy]
2592 ?? DL 0:00.01 [peer proxy]
2593 ?? DL 0:00.01 [peer proxy]
2597 ?? DL 0:00.00 [peer proxy]
3192 ?? S 0:00.01 /usr/sbin/irsd -N
3193 ?? S 0:00.05 /usr/sbin/snmpd -N
3194 ?? S 0:00.02 /sbin/dcd -N
3195 ?? S 0:00.01 /usr/sbin/pfed -N
3196 ?? S 0:00.01 /usr/sbin/mib2d -N

```

```

3197 ?? S      0:00.02 /usr/sbin/dfwd -N
3198 ?? S      0:00.13 /usr/sbin/ksyncd -N
3228 ?? Ss     0:00.00 mgd: (mgd) (root) (mgd)
3229 ?? R      0:00.00 /bin/ps -ax
1138 d0- S     0:00.00 /usr/sbin/usbd -N
1156 d0- S     0:00.42 /usr/sbin/eventd -N -r -s -A
1517 d0 Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
...

```

show system processes sfc (TX Matrix Plus Router)

```

user@host> show system processes sfc 0
sfc0-re0:

```

PID	TT	STAT	TIME	COMMAND
0	??	Wls	0:00.00	[swapper]
1	??	SLs	0:00.18	/packages/mnt/jbase/sbin/init --
2	??	DL	0:00.20	[g_event]
3	??	DL	0:00.39	[g_up]
4	??	DL	0:00.32	[g_down]
5	??	DL	0:00.00	[thread taskq]
6	??	DL	0:00.09	[kqueue taskq]
7	??	DL	0:00.01	[pagedaemon]
8	??	DL	0:00.00	[vmdaemon]
9	??	DL	0:06.63	[pagezero]
10	??	DL	0:00.00	[ktrace]
11	??	RL	312:09.00	[idle]
12	??	WL	0:11.07	[swi2: net]
13	??	WL	0:27.70	[swi7: clock sio]
14	??	WL	0:00.00	[swi6: vm]
15	??	DL	0:03.03	[yarrow]
16	??	WL	0:00.00	[swi9: +]
17	??	WL	0:00.00	[swi8: +]
18	??	WL	0:00.00	[swi5: cambio]
19	??	WL	0:00.00	[swi9: task queue]
20	??	WL	0:11.46	[irq16: uhci0 uhci*]
21	??	DL	0:00.00	[usb0]
22	??	DL	0:00.00	[usbtask]
23	??	WL	0:39.63	[irq17: uhci1 uhci*]
24	??	DL	0:00.00	[usb1]
25	??	WL	0:00.00	[irq18: uhci2 uhci*]
26	??	DL	0:00.84	[usb2]
27	??	DL	0:00.00	[usb3]
28	??	DL	0:00.00	[usb4]
29	??	DL	0:00.00	[usb5]
30	??	DL	0:00.73	[usb6]
31	??	DL	0:00.00	[usb7]
32	??	WL	0:00.00	[irq14: ata0]
33	??	WL	0:00.00	[irq15: ata1]
34	??	WL	0:00.00	[irq1: atkbd0]
35	??	WL	0:00.00	[swi0: sio]
36	??	WL	0:00.00	[irq11: isab0]
37	??	WL	0:00.00	[swi3: ip6opt ipopt]
38	??	WL	0:00.00	[swi4: ip6mismatch+]
39	??	WL	0:00.00	[swi1: ipfwd]
40	??	DL	0:00.02	[bufdaemon]
41	??	DL	0:00.02	[vn1ru]
42	??	DL	0:00.39	[syncer]
43	??	DL	0:00.05	[softdepflush]
44	??	DL	0:00.00	[netdaemon]
45	??	DL	0:00.02	[vmuncachedaemon]

```

46 ?? DL 0:00.00 [if_pic_listen]
47 ?? DL 0:00.35 [vmkmemdaemon]
48 ?? DL 0:00.00 [cb_poll]
49 ?? DL 0:00.06 [if_pfe_listen]
50 ?? DL 0:00.00 [scs_housekeeping]
51 ?? IL 0:00.00 [kern_dump_proc]
52 ?? IL 0:00.00 [nfsiod 0]
53 ?? IL 0:00.00 [nfsiod 1]
54 ?? IL 0:00.00 [nfsiod 2]
55 ?? IL 0:00.00 [nfsiod 3]
56 ?? DL 0:00.37 [schedcpu]
57 ?? DL 0:00.56 [md0]
79 ?? DL 0:02.58 [md1]
100 ?? DL 0:00.03 [md2]
118 ?? DL 0:00.01 [md3]
139 ?? DL 0:00.95 [md4]
160 ?? DL 0:00.12 [md5]
181 ?? DL 0:00.00 [md6]
217 ?? DL 0:00.02 [md7]
227 ?? DL 0:00.05 [md8]
1341 ?? SL 0:01.35 [bcmTX]
1342 ?? SL 0:01.69 [bcmXGS3AsyncTX]
1343 ?? SL 0:41.57 [bcmLINK.0]
1345 ?? SL 0:33.97 [bcmLINK.1]
1350 ?? Is 0:00.01 /usr/sbin/cron
1502 ?? S 0:00.01 /sbin/watchdog -t-1
1503 ?? S 0:00.86 /usr/libexec/bslockd -mp -N
1504 ?? I 0:00.01 /usr/sbin/tnetd -N
1507 ?? S 0:01.32 /usr/sbin/alarmd -N
1508 ?? S 0:14.54 /usr/sbin/craftd -N
1509 ?? S 0:01.20 /usr/sbin/mgd -N
1512 ?? S 0:00.05 /usr/sbin/inetd -N
1513 ?? S 0:00.10 /usr/sbin/tnp.sntpd -N
1517 ?? S 0:00.11 /usr/sbin/smartd -N
1525 ?? S 0:01.11 /usr/sbin/idpd -N
1526 ?? S 0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
1527 ?? I 0:00.01 /usr/libexec/getty Pc ttyv0
1616 ?? DL 0:00.30 [peer proxy]
1617 ?? DL 0:00.32 [peer proxy]
1618 ?? DL 0:00.34 [peer proxy]
1619 ?? DL 0:00.30 [peer proxy]
2391 ?? Is 0:00.01 telnetd
7331 ?? Ss 0:00.03 telnetd
9538 ?? DL 0:01.16 [jsr_kkcm]
9613 ?? DL 0:00.18 [peer proxy]
23781 ?? Ss 0:00.01 telnetd
23926 ?? Ss 0:00.03 mgd: (mgd) (user)/dev/tty2 (mgd)
36867 ?? S 0:03.14 /usr/sbin/rpd -N
36874 ?? S 0:00.08 /usr/sbin/lmpd
36876 ?? S 0:00.17 /usr/sbin/lacpd -N
36877 ?? S 0:00.15 /usr/sbin/bfdd -N
36878 ?? S 0:05.05 /usr/sbin/ppmd -N
36907 ?? S 0:26.63 /usr/sbin/chassisd -N
37775 ?? S 0:00.01 /usr/sbin/bdbrepd -N
45727 ?? S 0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729 ?? S 0:00.40 /usr/sbin/l2ald -N
45730 ?? S< 0:00.13 /usr/sbin/apds -N
45731 ?? SN 0:00.10 /usr/sbin/sampled -N
45732 ?? S 0:00.03 /usr/sbin/ilmid -N
45733 ?? S 0:00.09 /usr/sbin/rmopd -N
45734 ?? S 0:00.31 /usr/sbin/cosd

```

```

45735 ?? I      0:00.00 /usr/sbin/rtspd -N
45736 ?? S      0:00.06 /usr/sbin/fsad -N
45737 ?? S      0:00.05 /usr/sbin/rdd -N
45738 ?? S      0:00.10 /usr/sbin/pppd -N
45739 ?? S      0:00.05 /usr/sbin/dfcd -N
45740 ?? S      0:00.08 /usr/sbin/lfmd -N
45741 ?? S      0:00.01 /usr/sbin/mpiisoamd -N
45742 ?? I      0:00.01 /usr/sbin/sendd -N
45743 ?? S      0:00.08 /usr/sbin/appidd -N
45744 ?? S      0:00.05 /usr/sbin/mspd -N
45745 ?? S      0:00.27 /usr/sbin/jdiameterd -N
45746 ?? S      0:00.10 /usr/sbin/pfed -N
45747 ?? S      0:00.19 /usr/sbin/lpdfd -N
45748 ?? S      0:00.64 /sbin/dcd -N
45750 ?? S      0:00.46 /usr/sbin/mib2d -N
45751 ?? S      0:00.16 /usr/sbin/dfwd -N
45752 ?? S      0:00.15 /usr/sbin/irsd -N
45764 ?? S      0:20.60 /usr/sbin/snmpd -N
56481 ?? Ss     0:00.02 telnetd
56548 ?? Rs     0:00.19 mgd: (mgd) (user)/dev/tty0 (mgd)
56577 ?? Ss     0:00.00 mgd: (mgd) (root) (mgd)
56578 ?? R      0:00.00 /bin/ps -ax
1142 d0- S      0:00.01 /usr/sbin/usbd -N
1160 d0- S      0:29.71 /usr/sbin/eventd -N -r -s -A
6527 d0 Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
56482 p0 Is     0:00.00 login [pam] (login)
56483 p0 S       0:00.01 -csh (csh)
56547 p0 S+     0:00.02 cli
2392 p1 Is     0:00.00 login [pam] (login)
2393 p1 I       0:00.00 -csh (csh)
2394 p1 I       0:00.00 su -
2395 p1 I+     0:00.01 -su (csh)
23782 p2 Is     0:00.00 login [pam] (login)
23881 p2 I       0:00.00 -csh (csh)
23925 p2 S+     0:00.03 cli
7332 p3 Is     0:00.00 login [pam] (login)
7333 p3 I       0:00.00 -csh (csh)
23780 p3 S+     0:00.02 telnet aj

```

show system processes lcc wide (TX Matrix Plus Routing Matrix)

```

user@host> show system processes lcc 2 wide
lcc2-re0:

```

```

-----
PID  TT  STAT  TIME PROVIDER COMMAND
0   ??  WLS   0:00.00 (null)  [swapper]
1   ??  ILs   0:00.19          /packages/mnt/jbase/sbin/init --
2   ??  DL    0:00.02          [g_event]
3   ??  DL    0:00.19          [g_up]
4   ??  DL    0:00.13          [g_down]
5   ??  DL    0:00.00          [thread taskq]
6   ??  DL    0:00.00          [kqueue taskq]
7   ??  DL    0:00.00          [pagedaemon]
8   ??  DL    0:00.00          [vmdaemon]
9   ??  DL    0:01.77          [pagezero]
10  ??  DL    0:00.00          [ktrace]
11  ??  RL    20:33.81         [idle]
12  ??  WL    0:00.38          [swi2: net]
13  ??  WL    0:01.43          [swi7: clock sio]
14  ??  WL    0:00.00          [swi6: vm]
15  ??  DL    0:00.14          [yarrow]

```

16	??	WL	0:00.00	[swi9: +]
17	??	WL	0:00.00	[swi8: +]
18	??	WL	0:00.00	[swi5: cambio]
19	??	WL	0:00.00	[swi9: task queue]
20	??	WL	0:03.18	[irq10: bcm0 uhci1*]
21	??	WL	0:00.03	[irq11: cb0 uhci0+*]
22	??	DL	0:00.00	[usb0]
23	??	DL	0:00.00	[usbtask]
24	??	DL	0:00.00	[usb1]
25	??	DL	0:00.06	[usb2]
26	??	DL	0:00.00	[usb3]
27	??	DL	0:00.00	[usb4]
28	??	DL	0:00.00	[usb5]
29	??	DL	0:00.05	[usb6]
30	??	DL	0:00.00	[usb7]
31	??	WL	0:00.00	[irq14: ata0]
32	??	WL	0:00.00	[irq15: ata1]
33	??	WL	0:00.00	[irq1: atkbd0]
34	??	WL	0:00.00	[swi0: sio]
35	??	WL	0:00.00	[swi3: ip6opt ipopt]
36	??	WL	0:00.00	[swi4: ip6mismatch+]
37	??	WL	0:00.00	[swi1: ipfwd]
38	??	DL	0:00.00	[bufdaemon]
39	??	DL	0:00.00	[vnlru]
40	??	DL	0:00.02	[syncer]
41	??	DL	0:00.01	[softdepflush]
42	??	DL	0:00.00	[netdaemon]
43	??	DL	0:00.00	[vmuncachedaemon]
44	??	DL	0:00.00	[if_pic_listen]
45	??	DL	0:00.03	[vmkmemdaemon]
46	??	DL	0:00.01	[cb_poll]
47	??	DL	0:00.00	[if_pfe_listen]
48	??	DL	0:00.00	[scs_housekeeping]
49	??	IL	0:00.00	[kern_dump_proc]
50	??	IL	0:00.00	[nfsiod 0]
51	??	IL	0:00.00	[nfsiod 1]
52	??	IL	0:00.00	[nfsiod 2]
53	??	IL	0:00.00	[nfsiod 3]
54	??	DL	0:00.02	[schedcpu]
55	??	DL	0:00.75	[md0]
77	??	DL	0:03.84	[md1]
98	??	DL	0:00.59	[md2]
116	??	DL	0:00.02	[md3]
137	??	DL	0:00.72	[md4]
158	??	DL	0:00.15	[md5]
179	??	DL	0:00.00	[md6]
215	??	DL	0:00.03	[md7]
225	??	DL	0:00.03	[md8]
1052	??	DL	0:00.00	[jsr_kkcm]
1337	??	SL	0:00.11	[bcmTX]
1338	??	SL	0:00.12	[bcmXGS3AsyncTX]
1339	??	SL	0:03.82	[bcmLINK.0]
1344	??	Is	0:00.00	/usr/sbin/cron
1496	??	I	0:00.00	/sbin/watchdog -t-1
1497	??	S	0:00.06	/usr/libexec/bslockd -mp -N
1498	??	I	0:00.01	/usr/sbin/tnetd -N
1500	??	S	0:09.93	/usr/sbin/chassisd -N
1501	??	S	0:00.05	/usr/sbin/alarmd -N
1502	??	I	0:00.39	/usr/sbin/craftd -N
1503	??	S	0:00.09	/usr/sbin/mgd -N
1506	??	I	0:00.05	/usr/sbin/inetd -N


```

1507 ?? I      0:00.00      /usr/sbin/tnp.sntpd -N
1508 ?? I      0:00.00      /usr/sbin/tnp.sntpc -N
1510 ?? S      0:00.01      /usr/sbin/smartd -N
1514 ?? I      0:00.07      /usr/sbin/jcsd -N
1515 ?? S      0:00.17      /usr/sbin/idpd -N
1516 ?? I      0:00.00      /usr/libexec/getty Pc ttyv0
2591 ?? DL     0:00.01      [peer proxy]
2592 ?? DL     0:00.01      [peer proxy]
2593 ?? DL     0:00.01      [peer proxy]
2597 ?? DL     0:00.01      [peer proxy]
3192 ?? S      0:00.02      /usr/sbin/irsd -N
3193 ?? S      0:00.05      /usr/sbin/snmpd -N
3194 ?? S      0:00.04      /sbin/dcd -N
3195 ?? I      0:00.01      /usr/sbin/pfed -N
3196 ?? S      0:00.02      /usr/sbin/mib2d -N
3197 ?? I      0:00.03      /usr/sbin/dfwd -N
3198 ?? S      0:00.15      /usr/sbin/ksyncd -N
3559 ?? Ss     0:00.00      mgd: (mgd) (root) (mgd)
3560 ?? R      0:00.00      /bin/ps -ax -Jpww
1138 d0- S      0:00.00      /usr/sbin/usbd -N
1156 d0- S      0:00.50      /usr/sbin/eventd -N -r -s -A
1517 d0 Is+    0:00.00      /usr/libexec/getty std.9600 ttyd0

```

show system processes (QFX Series and OCX Series)

```

user@switch> show system processes
PID TT STAT      TIME COMMAND
  0 ?? Wls    -2341043:-31.01 [swapper]
  1 ?? SLs     0:01.34 /packages/mnt/jbase/sbin/init --
  2 ?? DL      2:48.31 [g_event]
  3 ?? DL      1:47.44 [g_up]
  4 ?? DL      1:37.82 [g_down]
  5 ?? DL      0:00.00 [kdm_tcp_poller]
  6 ?? DL      0:00.00 [thread taskq]
  7 ?? DL      0:04.86 [kqueue taskq]
  9 ?? DL      0:03.94 [pagedaemon]
 10 ?? DL      0:00.00 [ktrace]
 11 ?? RL      0:00.00 [idle: cpu31]
 12 ?? RL      0:00.00 [idle: cpu30]
 13 ?? RL      0:00.00 [idle: cpu29]
 14 ?? RL      0:00.00 [idle: cpu28]
 15 ?? RL      0:00.00 [idle: cpu27]
 16 ?? RL      0:00.00 [idle: cpu26]
 17 ?? RL      0:00.00 [idle: cpu25]
 18 ?? RL      0:00.00 [idle: cpu24]
 19 ?? RL      0:00.00 [idle: cpu23]
 20 ?? RL      0:00.00 [idle: cpu22]
 21 ?? RL      0:00.00 [idle: cpu21]
 22 ?? RL      0:00.00 [idle: cpu20]
 23 ?? RL      0:00.00 [idle: cpu19]
 24 ?? RL      0:00.00 [idle: cpu18]
 25 ?? RL      0:00.00 [idle: cpu17]
 26 ?? RL      0:00.00 [idle: cpu16]
 27 ?? RL      0:00.00 [idle: cpu15]
 28 ?? RL      0:00.00 [idle: cpu14]
 29 ?? RL      0:00.00 [idle: cpu13]
 30 ?? RL      0:00.00 [idle: cpu12]
 31 ?? RL      0:00.00 [idle: cpu11]
 32 ?? RL      0:00.00 [idle: cpu10]
 33 ?? RL      0:00.00 [idle: cpu9]
 34 ?? RL     18184:07.25 [idle: cpu8]

```

```

35 ?? RL      0:00.00 [idle: cpu7]
36 ?? RL    17862:11.31 [idle: cpu6]
37 ?? RL    19343:45.16 [idle: cpu5]
38 ?? RL    5192:38.30 [idle: cpu4]
39 ?? RL      0:00.00 [idle: cpu3]
40 ?? RL    19278:02.24 [idle: cpu2]
41 ?? RL    19291:00.72 [idle: cpu1]
42 ?? RL    18910:31.21 [idle: cpu0]
43 ?? WL     19:03.74 [swi2: net]
44 ?? WL    261:43.82 [swi7: clock sio]
45 ?? WL      0:00.00 [swi6: vm]
46 ?? DL     2:18.57 [yarrow]
47 ?? WL      0:00.00 [swi9: +]
48 ?? WL      0:00.00 [swi8: +]
49 ?? WL     0:12.36 [swi5: cambio]
50 ?? WL      0:00.00 [swi9: task queue]
51 ?? WL      0:00.00 [swi0: sio]
52 ?? WL     0:32.40 [irq39: ehci0]
53 ?? DL      0:00.21 [usb0]
54 ?? DL      0:00.00 [usbtask]
55 ?? WL      0:00.00 [irq22: xlr_lbus0]
56 ?? WL      0:00.00 [irq38: xlr_lbus0]
57 ?? WL      0:00.00 [swi3: ip6opt ipopt]
58 ?? WL      0:00.00 [swi4: ip6mismatch+]
59 ?? WL      0:00.00 [swi1: ipfwd]
60 ?? DL     0:18.65 [pagezero]
61 ?? DL     0:18.59 [bufdaemon]
62 ?? DL     1:10.44 [vnlr_u_mem]
63 ?? DL     1:51.66 [syncer]
64 ?? DL     0:20.22 [vnlr_u]
65 ?? DL     0:40.48 [softdepflush]
66 ?? DL      0:00.00 [netdaemon]
67 ?? DL    20:47.67 [vmkmemdaemon]
68 ?? DL      0:00.00 [if_pfe_listen]
69 ?? SL     0:02.80 [kdm_checkkcore]
70 ?? SL     0:03.34 [kdm_savekcore]
71 ?? SL     0:04.31 [kdm_livekcore]
72 ?? SL     0:06.14 [kdm_logger]
73 ?? SL     0:04.31 [kdm_kdb]
74 ?? SL      0:00.02 [devrt_kernel_thread]
75 ?? DL     0:21.54 [vmuncachedaemon]
76 ?? DL      0:00.00 [if_pic_listen0]
77 ?? SL      0:00.00 [nfsiod 0]
78 ?? SL      0:00.00 [nfsiod 1]
79 ?? SL      0:00.00 [nfsiod 2]
80 ?? SL      0:00.00 [nfsiod 3]
81 ?? WL     5:59.98 [irq13: +]
82 ?? RL    105:06.81 [pkt_sender: cpu0]
83 ?? DL      0:03.62 [md0]
95 ?? DL      0:37.04 [md1]
115 ?? DL     0:06.01 [md2]
135 ?? DL     0:00.75 [md3]
155 ?? DL     0:21.17 [md4]
175 ?? DL     0:01.90 [md5]
195 ?? DL     0:06.26 [md6]
231 ?? DL     0:00.01 [md7]
755 ?? Ss     0:04.17 /usr/sbin/cron
847 ?? S      0:00.10 /usr/sbin/tnetd -N
849 ?? S      0:06.82 /usr/sbin/mgd -N
850 ?? S      0:00.32 /usr/sbin/inetd -N
852 ?? S      1:05.34 /usr/sbin/dhcpd -N

```

```

853 ?? S      0:00.18 /usr/sbin/inetd -p /var/run/inetd_4.pid -N -JU __juni
855 ?? L 1181:02.21 /usr/sbin/dc-pfe -N (pafxpc)
857 ?? S      17:55.86 /usr/sbin/vccpd -N
896 ?? S      93:43.45 /usr/sbin/chassism -N
953 ?? S      0:02.89 /sbin/watchdog -t-1
954 ?? S      3:34.00 /sbin/dcd -N
955 ?? S     10:30.13 /usr/sbin/chassisd -N
956 ?? DL     0:00.21 [peer proxy]
957 ?? S      4:07.43 /usr/sbin/alarmd -N
958 ?? S      0:31.69 /usr/sbin/craftd -N
959 ?? S      0:55.16 /usr/sbin/mib2d -N
960 ?? S      3:40.64 /usr/sbin/rpd -N
961 ?? S      0:00.03 /usr/sbin/tnp.snmpd -N
962 ?? S      0:51.94 /usr/sbin/pfed -N
963 ?? S      0:47.31 /usr/sbin/rmopd -N
964 ?? S      0:33.65 /usr/sbin/cosd
965 ?? S      1:48.41 /usr/sbin/ppmd -N
966 ?? S      0:07.18 /usr/sbin/dfwd -N
967 ?? S      1:02.56 /usr/sbin/bfdd -N
968 ?? S      0:00.63 /usr/sbin/rdd -N
969 ?? S      0:40.61 /usr/sbin/dfcd -N
971 ?? S      0:07.81 /usr/sbin/bdbrepd -N
972 ?? S      0:00.28 /usr/sbin/sendd -N
973 ?? S      1:37.69 /usr/sbin/xntpd -j -N -g -JU __example_process4__ (nt
974 ?? S      5:56.28 /usr/sbin/snmpd -N -JU __example_process4__
975 ?? S     16:46.82 /usr/sbin/jdiameterd -N
976 ?? S      2:34.13 /usr/sbin/eswd -N
977 ?? S      1:03.05 /usr/sbin/sflowd -N
978 ?? S      0:22.30 /usr/sbin/fcd -N
979 ?? S      1:07.01 /usr/sbin/vccpdf -N
982 ?? S      0:25.25 /usr/sbin/mcsnoopd -N
983 ?? S      3:45.68 /usr/sbin/rpdf -N
1043 ?? S      0:37.87 /usr/sbin/lacpd -N
1048 ?? DL     0:01.29 [peer proxy]
1111 ?? WL     0:00.00 [swi2: FMNITHRD+]
1112 ?? DL     0:00.03 [peer proxy]
12816 ?? S     15:35.32 /usr/sbin/sfid -N
30893 ?? Ss     0:00.65 sshd: tlewis@tty0 (sshd)
30897 ?? Ss     0:00.15 mgd: (mgd) (tlewis)/dev/tty0 (mgd)
30905 ?? Ss     0:00.64 sshd: tlewis@tty1 (sshd)
30909 ?? Ss     0:00.15 mgd: (mgd) (tlewis)/dev/tty1 (mgd)
30910 ?? Ss     0:01.26 sshd: tcheng@tty2 (sshd)
30914 ?? Ss     0:00.80 mgd: (mgd) (tcheng)/dev/tty2 (mgd)
30937 ?? R      0:00.03 /bin/ps -ax
    661 d0- S      0:21.24 /usr/sbin/eventd -N -r -s -A
    860 d0 Ss+     0:00.07 /usr/libexec/getty std.9600 ttyd0
30896 p0 Ss+     0:00.55 -cli (cli)
30908 p1 Ss+     0:00.50 -cli (cli)
30913 p2 Ss+     0:00.85 -cli (cli)

```

show system queues

List of Syntax	Syntax on page 244 Syntax (TX Matrix Router) on page 244 Syntax (TX Matrix Plus Router) on page 244 Syntax (MX Series Router) on page 244
Syntax	show system queues
Syntax (TX Matrix Router)	show system queues <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	show system queues <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	show system queues <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Description	Display queue statistics.
Options	<p>all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system queue statistics for all the T640 routers in the chassis that are connected to the TX Matrix router. On a TX Matrix Plus router, display system queue statistics for all the T1600 or T4000 routers in the chassis that are connected to the TX Matrix Plus router.</p> <p>all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system queue statistics for all LCC chassis attached to the TX Matrix or TX Matrix Plus router.</p> <p>all-members—(MX Series routers only) (Optional) Display system queue statistics for all members of the Virtual Chassis configuration.</p> <p>lcc <i>number</i>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system queue statistics for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system queue statistics for a specific connected router that is connected to the TX Matrix Plus router.</p>

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display system queue statistics for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display system queue statistics for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Display queue statistics for the TX Matrix router.

sfc *number*—(TX Matrix Plus routers only) (Optional) Display system queue statistics for the TX Matrix Plus router. Replace *number* with 0.

Additional Information	By default, when you issue the show system queues command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • Routing Matrix with a TX Matrix Plus Router Solutions Page
List of Sample Output	show system queues on page 246 show system queues (SRX Series) on page 246 show system queues scc (TX Matrix Router) on page 247 show system queues sfc (TX Matrix Router) on page 248
Output Fields	Table 8 on page 246 lists the output fields for the show system queues command. Output fields are listed in the approximate order in which they appear.

Table 8: show system queues Output Fields

Field Name	Field Description
Output interface	Interface on the device on which the queue exists: <ul style="list-style-type: none"> fxp0—Management Ethernet interface. fxp1—Internal Ethernet interface. ipip, lsi, tap, mt, mtun, pimd, and pime—Internally generated interface and not configurable. dsc—Discard interface. em—Management and internal Ethernet interfaces. gre—Internally generated interface that is configurable only as the control channel for Generalized MPLS (GMPLS). ge—Gigabit Ethernet interface. xe—10-Gigabit Ethernet interface. lo—Loopback interface; the Junos OS automatically configures one loopback interface (lo0). lsq—Link services IQ interface. lt—Logical tunnel interface. gr, ip, sp—Services interfaces. irb—Integrated routing and bridging interface. vtep—Virtual Tunnel End Point (VTEP). ppd and ppe—Interfaces used to enable a cluster to act as a rendezvous point (RP) or first hop router in the multicast domain.
bytes	Number of bytes in the queue.
max	Maximum number of bytes allowed in the queue.
packets	Number of packets in the queue.
max	Maximum number of packets allowed in the queue.
drops	Number of packets dropped from the queue.

Sample Output

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 (SRX Series)

```

user@host> show system queues
output interface      bytes      max  packets      max  drops
lsi                   0       12500      0        41      0

```

dsc	0	0	0	0	0
lo0	0	0	0	0	0
fxp0	0	12500000	0	41666	4
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
em0	0	12500000	0	41666	0
em1	0	12500000	0	41666	0
em2	0	12500000	0	41666	0
mtun	0	12500	0	41	0
pp0	0	125000	0	416	0
irb	0	12500000	0	41666	0
vtep	0	12500000	0	41666	0
st0	0	125000	0	416	0
ppd0	0	12500	0	41	0
ppe0	0	12500	0	41	0
vlan	0	0	0	0	0
ge-0/0/0	0	1250000	0	4166	0
ge-0/0/1	0	1250000	0	4166	0
ge-0/0/2	0	1250000	0	4166	1
ge-0/0/3	0	1250000	0	4166	0
ge-0/0/4	0	1250000	0	4166	1
ge-0/0/5	0	1250000	0	4166	1
ge-0/0/6	0	1250000	0	4166	0
ge-0/0/7	0	1250000	0	4166	0
ge-0/0/8	0	1250000	0	4166	0
ge-0/0/9	0	1250000	0	4166	0
ge-0/0/10	0	1250000	0	4166	0
ge-0/0/11	0	1250000	0	4166	0
ge-0/0/12	0	1250000	0	4166	0
ge-0/0/13	0	1250000	0	4166	0
ge-0/0/14	0	1250000	0	4166	0
ge-0/0/15	0	1250000	0	4166	0
xe-0/0/16	0	1250000	0	4166	0
xe-0/0/17	0	1250000	0	4166	0
xe-0/0/18	0	1250000	0	4166	0
xe-0/0/19	0	1250000	0	4166	0
sp-0/0/0	0	1250000	0	4166	0
gr-0/0/0	0	12500	0	41	0
ip-0/0/0	0	12500	0	41	0
lsq-0/0/0	0	125000	0	416	0
mt-0/0/0	0	12500	0	41	0
lt-0/0/0	0	12500	0	41	0
input protocol	bytes	max	packets	max	drops
sp1fwdq	0	1000000	0	1000	0
sp1netq	0	1000000	0	1000	0
optionq	0	200000	0	200	0
icmpq	0	50000	0	50	0
frlmiq	0	0	0	0	0
spppintrq	0	25000	0	1000	0
atmctlpktq	0	0	0	0	0
atmoamq	0	0	0	0	0
tnpintrq	0	1250000	0	4166	0
tagintrq	0	200000	0	200	0
tagfragq	0	200000	0	200	0

show system queues scc (TX Matrix Router)

user@host> show system queues scc

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
sp1fwdq	0	1000000	0	1000	0
sp1netq	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 queues sfc (TX Matrix Router)

```
user@host> show system queues sfc 0
sfc0-re0:
```

output interface	bytes	max	packets	max	drops
ixgbe1	0	125000000	0	45000	4384
ixgbe0	0	125000000	0	45000	0
lsi	0	12500	0	41	0
dsc	0	0	0	0	0
lo0	0	0	0	0	0
em0	0	12500000	0	41666	1
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
xe-12/0/0	0	1250000	0	4166	0
xe-12/0/1	0	1250000	0	4166	0
xe-12/0/2	0	1250000	0	4166	0
xe-12/0/3	0	1250000	0	4166	0
xe-12/1/0	0	1250000	0	4166	0
xe-12/1/1	0	1250000	0	4166	0
xe-12/1/2	0	1250000	0	4166	0
xe-12/1/3	0	1250000	0	4166	0
xe-20/0/0	0	1250000	0	4166	0
xe-20/0/1	0	1250000	0	4166	0
xe-20/0/2	0	1250000	0	4166	0
xe-20/0/3	0	1250000	0	4166	0
xe-20/1/0	0	1250000	0	4166	0
xe-20/1/1	0	1250000	0	4166	0
xe-20/1/2	0	1250000	0	4166	0
xe-20/1/3	0	1250000	0	4166	0
ge-15/0/0	0	1250000	0	4166	75
ge-15/0/1	0	1250000	0	4166	0
ge-15/0/2	0	1250000	0	4166	75
ge-15/0/3	0	1250000	0	4166	75
ge-15/0/4	0	1250000	0	4166	0
ge-15/0/5	0	1250000	0	4166	0
ge-15/0/6	0	1250000	0	4166	0
ge-15/0/7	0	1250000	0	4166	0
ge-15/0/8	0	1250000	0	4166	0
ge-15/0/9	0	1250000	0	4166	0
xe-4/0/0	0	1250000	0	4166	0
xe-4/0/1	0	1250000	0	4166	0
xe-4/0/2	0	1250000	0	4166	0
xe-4/0/3	0	1250000	0	4166	0
xe-4/1/0	0	1250000	0	4166	0
xe-4/1/1	0	1250000	0	4166	0
xe-4/1/2	0	1250000	0	4166	0
xe-4/1/3	0	1250000	0	4166	0
xe-24/0/0	0	1250000	0	4166	0
xe-24/0/1	0	1250000	0	4166	0
xe-24/0/2	0	1250000	0	4166	0
xe-24/0/3	0	1250000	0	4166	0
xe-24/1/0	0	1250000	0	4166	0
xe-24/1/1	0	1250000	0	4166	0
xe-24/1/2	0	1250000	0	4166	0
xe-24/1/3	0	1250000	0	4166	0
ge-7/0/0	0	1250000	0	4166	0
ge-7/0/1	0	1250000	0	4166	0
ge-7/0/2	0	1250000	0	4166	0
ge-7/0/3	0	1250000	0	4166	75
ge-7/0/4	0	1250000	0	4166	0
ge-7/0/5	0	1250000	0	4166	0
ge-7/0/6	0	1250000	0	4166	0
ge-7/0/7	0	1250000	0	4166	0
ge-7/0/8	0	1250000	0	4166	0
ge-7/0/9	0	1250000	0	4166	0
so-7/1/0	0	125000	0	416	0
so-7/2/0	0	125000	0	416	0
xe-21/0/0	0	1250000	0	4166	0
xe-21/0/1	0	1250000	0	4166	0
xe-21/0/2	0	1250000	0	4166	0
xe-21/0/3	0	1250000	0	4166	0
xe-21/1/0	0	1250000	0	4166	0

xe-21/1/1	0	1250000	0	4166	0
xe-21/1/2	0	1250000	0	4166	0
xe-21/1/3	0	1250000	0	4166	0
xe-14/0/0	0	1250000	0	4166	0
xe-14/0/1	0	1250000	0	4166	0
xe-14/0/2	0	1250000	0	4166	0
xe-14/0/3	0	1250000	0	4166	0
xe-14/1/0	0	1250000	0	4166	0
xe-14/1/1	0	1250000	0	4166	0
xe-14/1/2	0	1250000	0	4166	0
xe-14/1/3	0	1250000	0	4166	0
xe-25/0/0	0	1250000	0	4166	0
xe-25/0/1	0	1250000	0	4166	0
xe-25/0/2	0	1250000	0	4166	0
xe-25/0/3	0	1250000	0	4166	0
xe-25/1/0	0	1250000	0	4166	0
xe-25/1/1	0	1250000	0	4166	0
xe-25/1/2	0	1250000	0	4166	0
xe-25/1/3	0	1250000	0	4166	0
so-22/0/0	0	125000	0	416	0
so-22/0/1	0	125000	0	416	0
so-22/0/2	0	125000	0	416	0
so-22/0/3	0	125000	0	416	0
xe-22/1/0	0	1250000	0	4166	0
xe-22/1/1	0	1250000	0	4166	0
xe-22/1/2	0	1250000	0	4166	0
xe-22/1/3	0	1250000	0	4166	0
xe-6/0/0	0	1250000	0	4166	0
xe-6/0/1	0	1250000	0	4166	0
xe-6/0/2	0	1250000	0	4166	0
xe-6/0/3	0	1250000	0	4166	0
xe-6/1/0	0	1250000	0	4166	0
xe-6/1/1	0	1250000	0	4166	0
xe-6/1/2	0	1250000	0	4166	0
xe-6/1/3	0	1250000	0	4166	0
xe-26/0/0	0	1250000	0	4166	0
xe-26/0/1	0	1250000	0	4166	0
xe-26/0/2	0	1250000	0	4166	0
xe-26/0/3	0	1250000	0	4166	0
xe-26/1/0	0	1250000	0	4166	0
xe-26/1/1	0	1250000	0	4166	0
xe-26/1/2	0	1250000	0	4166	0
xe-26/1/3	0	1250000	0	4166	0
ge-31/0/0	0	1250000	0	4166	0
ge-31/0/1	0	1250000	0	4166	0
ge-31/0/2	0	1250000	0	4166	0
ge-31/0/3	0	1250000	0	4166	0
ge-31/0/4	0	1250000	0	4166	75
ge-31/0/5	0	1250000	0	4166	0
ge-31/0/6	0	1250000	0	4166	75
ge-31/0/7	0	1250000	0	4166	0
ge-31/0/8	0	1250000	0	4166	0
ge-31/0/9	0	1250000	0	4166	0
pd-31/1/0	0	12500	0	41	0
pe-31/1/0	0	12500	0	41	0
gr-31/1/0	0	12500	0	41	0
ip-31/1/0	0	12500	0	41	0
vt-31/1/0	0	12500	0	41	0
mt-31/1/0	0	12500	0	41	0
lt-31/1/0	0	12500	0	41	0
so-29/0/0	0	125000	0	416	0

so-29/0/1	0	125000	0	416	0
so-29/0/2	0	125000	0	416	0
so-29/0/3	0	125000	0	416	0
xe-29/1/0	0	1250000	0	4166	0
xe-29/1/1	0	1250000	0	4166	0
xe-29/1/2	0	1250000	0	4166	0
xe-29/1/3	0	1250000	0	4166	0
so-28/0/0	0	125000	0	416	0
so-28/0/1	0	125000	0	416	0
so-28/0/2	0	125000	0	416	0
so-28/0/3	0	125000	0	416	0
ge-23/0/0	0	1250000	0	4166	0
ge-23/0/1	0	1250000	0	4166	0
ge-23/0/2	0	1250000	0	4166	0
ge-23/0/3	0	1250000	0	4166	0
ge-23/0/4	0	1250000	0	4166	0
ge-23/0/5	0	1250000	0	4166	0
ge-23/0/6	0	1250000	0	4166	0
ge-23/0/7	0	1250000	0	4166	0
ge-23/0/8	0	1250000	0	4166	0
ge-23/0/9	0	1250000	0	4166	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
atmctlpktq	0	0	0	0	0
atmoamq	0	0	0	0	0
tnpintrq	0	1250000	0	4166	0
tagintrq	0	200000	0	200	0
tagfragq	0	200000	0	200	0

show system reboot

List of Syntax	Syntax on page 252 Syntax (EX Series Switches) on page 252 Syntax (TX Matrix Router) on page 252 Syntax (TX Matrix Plus Router) on page 252 Syntax (MX Series Router) on page 252 Syntax (QFX Series and OCX Series) on page 252
Syntax	show system reboot <both-routing-engines>
Syntax (EX Series Switches)	show system reboot <all-members> <both-routing-engines> <local> <member <i>member-id</i> >
Syntax (TX Matrix Router)	show system reboot <all-chassis all-lcc lcc <i>number</i> scc> <both-routing-engines>
Syntax (TX Matrix Plus Router)	show system reboot <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> > <both-routing-engines>
Syntax (MX Series Router)	show system reboot <all-members> <both-routing-engines> <local> <member <i>member-id</i> >
Syntax (QFX Series and OCX Series)	show system reboot <both-routing-engines> <infrastructure <i>name</i> > <interconnect-device <i>name</i> > <node-device <i>name</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display pending system reboots or halts.
Options	none —Display pending reboots or halts on the active Routing Engine.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for all the T640 routers in the chassis that are connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for all the T1600 or T4000 routers in the chassis that are connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for all members of the Virtual Chassis configuration.

all-lcc—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display system halt or reboot request information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for all connected T1600 or T4000 LCCs.

both-routing-engines—(Systems with multiple Routing Engines) (Optional) Display halt or reboot request information on both Routing Engines.

infrastructure *name*—(QFabric systems only) (Optional) Display reboot request information on the fabric manager Routing Engines and fabric control Routing Engines.

interconnect-device *name*—(QFabric systems only) (Optional) Display reboot request information on the Interconnect device.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

node-group *name*—(QFabric systems only) (Optional) Display reboot request information on the Node group.

scc—(TX Matrix router only) (Optional) Display halt or reboot request information for the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus router only) (Optional) Display halt or reboot request information for the TX Matrix Plus router.

Additional Information By default, when you issue the **show system reboot** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) backup Routing Engines that are connected to it.

Required Privilege Level maintenance

Related Documentation

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output [show system reboot on page 254](#)
[show system reboot all-lcc \(TX Matrix Router\) on page 254](#)
[show system reboot sfc \(TX Matrix Plus Router\) on page 254](#)
[show system reboot \(QFX3500 Switch\) on page 255](#)

Sample Output

show system reboot

```
user@host> show system reboot
reboot requested by root at Wed Feb 10 17:40:46 1999
[process id 17885]
```

show system reboot all-lcc (TX Matrix Router)

```
user@host> show system reboot all-lcc
lcc0-re0:
-----
No shutdown/reboot scheduled.

lcc2-re0:
-----
No shutdown/reboot scheduled.
```

show system reboot sfc (TX Matrix Plus Router)

```
user@host> show system sfc 0
No shutdown/reboot scheduled.
```

show system reboot (QFX3500 Switch)

```
user@switch> show system reboot
No shutdown/reboot scheduled.
```

show system rollback

Syntax `show system rollback number`
`<compare number>`

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
 Command introduced in Junos OS Release 11.1 for the QFX Series.

Description Display the contents of a previously committed configuration, or the differences between two previously committed configurations.



NOTE: The `show system rollback` command is a purely operational mode command and cannot be issued with `run` from the configuration mode.

Options *number*—Number of a configuration to view. The output displays the configuration. The range of values is 0 through 49.

compare number —(Optional) Number of another previously committed (rollback) configuration to compare to rollback *number*. The output displays the differences between the two configurations. The range of values is 0 through 49.

Required Privilege Level view

List of Sample Output [show system rollback compare on page 256](#)

Sample Output

show system rollback compare

```
user@host> show system rollback 3 compare 1
[edit]
+ interfaces {
+   ge-1/1/1 {
+     unit 0 {
+       family inet {
+         filter {
+           input mf_plp;
+         }
+         address 10.1.1.1/10;
+       }
+     }
+   }
+   ge-1/2/1 {
+     unit 0 {
+       family inet {
+         filter {
```



```
+             input mf_plp;
+         }
+         address 10.1.1.1/10;
+     }
+ }
+ ge-1/3/0 {
+     unit 0 {
+         family inet {
+             filter {
+                 input mf_plp;
+             }
+             address 10.1.1.1/10;
+         }
+     }
+ }
+ }
```

show system snapshot

List of Syntax [Syntax on page 258](#)
 [Syntax \(EX Series Switches\) on page 258](#)

Syntax show system snapshot

Syntax (EX Series Switches) show system snapshot
 <all-members | local | member *member-id*>
 <media (external | internal)>

Release Information Command introduced in Junos OS Release 7.6.
 Command introduced in Junos OS Release 10.0 for EX Series switches.
 Option **slice** deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.



NOTE: To determine which platforms run Junos OS with Upgraded FreeBSD, see the table listing the platforms currently running Junos OS with upgraded FreeBSD in *Release Information for Junos OS with Upgraded FreeBSD*.

Description Display information about the backup software:

- On the routers, display information about the backup software, which is located in the **/altroot**, and **/altconfig** file systems or on the alternate media.
- On the switches, display information about the backup of the root file system (**/**) and directories **/altroot**, **/config**, **/var**, and **/var/tmp**, which are located either on an external USB flash drive or in internal flash memory.



NOTE: To back up software, use the **request system snapshot** command.

Options **none**—Display information about the backup software.

all-members | local | member *member-id*—(EX Series switch Virtual Chassis only)
 (Optional) Display the snapshot in a Virtual Chassis:

- **all-members**—Display the snapshot for all members of the Virtual Chassis.
- **local**—Display the snapshot on the member of the Virtual Chassis that you are currently logged into.
- **member *member-id***—Display the snapshot for the specified member of the Virtual Chassis.

media (external | internal)—(EX Series switch only) (Optional) Display the destination media location for the snapshot. The **external** option specifies the snapshot on an external mass storage device, such as a USB flash drive. The **internal** option specifies the snapshot on an internal memory source, such as internal flash memory. If no additional options are specified, the command displays the snapshot stored in both slices.

Required Privilege Level view

Related Documentation

- [request system snapshot on page 174](#)

List of Sample Output

- [show system snapshot \(Router\) on page 259](#)
- [show system snapshot media external \(Switch\) on page 259](#)
- [show system snapshot media internal \(Switch\) on page 260](#)

Output Fields Table 9 on page 259 lists the output fields for the **show system snapshot** command. Output fields are listed in the approximate order in which they appear.

Table 9: show system snapshot Output Fields

Field Name	Field Description
Creation date	Date and time of the last snapshot.
JUNOS version on snapshot	Junos OS release number of individual software packages.

Sample Output

show system snapshot (Router)

```
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
```

show system snapshot media external (Switch)

```
user@switch> show system snapshot media external
Information for snapshot on          external (/dev/dals1a) (backup)
Creation date: Mar 19 03:37:18 2012
JUNOS version on snapshot:
  jbase   : ex-12.1I20120111_0048_user
  jcrypto-ex: 12.1I20120111_0048_user
  jdocs-ex: 12.1I20120111_0048_user
```

```
jroute-ex: 12.1I20120111_0048_user
jswitch-ex: 12.1I20120111_0048_user
jweb-ex: 12.1I20120111_0048_user
Information for snapshot on      external (/dev/da1s2a) (primary)
Creation date: Mar 19 03:38:25 2012
JUNOS version on snapshot:
  jbase   : ex-12.2I20120305_2240_user
  jcrypto-ex: 12.2I20120305_2240_user
  jdocs-ex: 12.2I20120305_2240_user
  jroute-ex: 12.2I20120305_2240_user
  jswitch-ex: 12.2I20120305_2240_user
  jweb-ex: 12.2I20120305_2240_user
```

show system snapshot media internal (Switch)

```
user@switch> show system snapshot media internal
Information for snapshot on internal (/dev/da0s1a) (backup)
Creation date: Mar 14 05:01:02 2011
JUNOS version on snapshot:
  jbase   : 11.1R1.9
  jcrypto-ex: 11.1R1.9
  jdocs-ex: 11.1R1.9
  jkernel-ex: 11.1R1.9
  jroute-ex: 11.1R1.9
  jswitch-ex: 11.1R1.9
  jweb-ex: 11.1R1.9
  jpfe-ex42x: 11.1R1.9
Information for snapshot on internal (/dev/da0s2a) (primary)
Creation date: Mar 30 08:46:27 2011
JUNOS version on snapshot:
  jbase   : 11.2-20110330.0
  jcrypto-ex: 11.2-20110330.0
  jdocs-ex: 11.2-20110330.0
  jkernel-ex: 11.2-20110330.0
  jroute-ex: 11.2-20110330.0
  jswitch-ex: 11.2-20110330.0
  jweb-ex: 11.2-20110330.0
  jpfe-ex42x: 11.2-20110330.0
```

show system software

List of Syntax	Syntax on page 261 Syntax (EX Series Switches) on page 261 Syntax (TX Matrix Router) on page 261 Syntax (TX Matrix Plus Router) on page 261 Syntax (QFX Series) on page 261
Syntax	show system software <detail>
Syntax (EX Series Switches)	show system software <all-members> <detail> <local> <member <i>member-id</i> >
Syntax (TX Matrix Router)	show system software <all-chassis all-lcc lcc <i>number</i> scc> <detail>
Syntax (TX Matrix Plus Router)	show system software <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> > <detail>
Syntax (QFX Series)	show system software <detail> <infrastructure <i>name</i> > <interconnect-device <i>name</i> > <node-group <i>name</i> >
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display the Junos OS extensions loaded on your router or switch.
Options	<p>none—Display standard information about all loaded Junos OS extensions.</p> <p>all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system software information for all the T640 routers (TX Matrix Router) or all the routers (TX Matrix Plus Router) in the chassis.</p> <p>all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for all T640 routers connected to the</p>

TX Matrix router. On a TX Matrix Plus router, display system software information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches only) (Optional) Display the system software running on all members of the Virtual Chassis configuration.

detail—(Optional) Display detailed information about available Junos OS extensions.

infrastructure name—(QFabric systems only) (Optional) Display the system software running on the fabric control Routing Engine and the fabric manager Routing Engine.

interconnect-device name—(QFabric systems only) (Optional) Display the system software running on the Interconnect device.

lcc number—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system software information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches only) (Optional) Display the system software running on the local Virtual Chassis member.

member member-id—(EX4200 switches only) (Optional) Display the system software running on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value from 0 through 9.

node-group name—(QFabric systems only) (Optional) Display the system software running on the Node group.

scc—(Routing matrix only) (Optional) Display the system software running on a TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display system software information for the TX Matrix Plus router.

Required Privilege Level maintenance

Related Documentation

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show system software on page 263](#)
[show system software \(TX Matrix Plus Router\) on page 263](#)
[show system software \(QFX Series\) on page 267](#)

Output Fields

When you enter this command, you are provided a list of Junos OS packages installed on the router and their corresponding Junos OS release number.

Sample Output

show system software

```
user@host> show system software
Information for jbase:

Comment:
JUNOS Base OS Software Suite [7.2R1.7]

Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [7.2R1.7]
Information for jdocs:

Comment:
JUNOS Online Documentation [7.2R1.7]

Information for jkernel:

Comment:
JUNOS Kernel Software Suite [7.2R1.7]

Information for jpfe:

Comment:
JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]

Information for jroute:

Comment:
JUNOS Routing Software Suite [7.2R1.7]

Information for junos:

Comment:
JUNOS Base OS boot [7.2R1.7]
```

show system software (TX Matrix Plus Router)

```
user@host> show system software
```

sfc0-re0:

Information for jbase:

Comment:

JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [9.6-20090515.0]

Information for jdocs:

Comment:

JUNOS Online Documentation [9.6-20090515.0]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [9.6-20090515.0]

Information for jpfe:

Comment:

JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]

Information for jpfe-common:

Comment:

JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]

Information for jroute:Comment:

JUNOS Routing Software Suite [9.6-20090515.0]

Information for jservices-aacl:

Comment:

JUNOS Services ACL Container package [9.6-20090515.0]

Information for jservices-appid:

Comment:

JUNOS AppId Services [9.6-20090515.0]

Information for jservices-bgpf:

Comment:
JUNOS Border Gateway Function package [9.6-20090515.0]
Information for jservices-idp:

Comment:
JUNOS IDP Services [9.6-20090515.0]

Information for jservices-llpdf:

Comment:
JUNOS Services LL-PDF Container package [9.6-20090515.0]

Information for jservices-sfw:

Comment:
JUNOS Services Stateful Firewall [9.6-20090515.0]
Information for jservices-voice:

Comment:
JUNOS Voice Services Container package [9.6-20090515.0]

Information for junos:

Comment:
JUNOS Base OS boot [9.6-20090515.0]
...
lcc0-re0:

Information for jbase:

Comment:
JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [9.6-20090515.0]

Information for jdocs:

Comment:
JUNOS Online Documentation [9.6-20090515.0]

Information for jkernel:

Comment:
JUNOS Kernel Software Suite [9.6-20090515.0]

Information for jpfe:

Comment:

JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]

Information for jpfe-common:

Comment:

JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]

Information for jroute:

Comment:

JUNOS Routing Software Suite [9.6-20090515.0]

Information for jservices-aacl:

Comment:

JUNOS Services ACL Container package [9.6-20090515.0]

Information for jservices-appid:

Comment:

JUNOS AppId Services [9.6-20090515.0]

Information for jservices-bgf:

Comment:

JUNOS Border Gateway Function package [9.6-20090515.0]

Information for jservices-idp:

Comment:

JUNOS IDP Services [9.6-20090515.0]

Information for jservices-llpdf:

Comment:

JUNOS Services LL-PDF Container package [9.6-20090515.0]

Information for jservices-sfw:

Comment:

JUNOS Services Stateful Firewall [9.6-20090515.0]

Information for jservices-voice:

Comment:

JUNOS Voice Services Container package [9.6-20090515.0]

Information for junos:

Comment:

JUNOS Base OS boot [9.6-20090515.0]

lcc1-re0:

Information for jbase:

Comment:

JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [9.6-20090515.0]

...

show system software (QFX Series)

user@switch> **show system software**

Information for jbase:

Comment:

JUNOS Base OS Software Suite [11.3-20110730.0]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [11.3-20110730.0]

Information for jdocs:

Comment:

JUNOS Online Documentation [11.3-20110730.0]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [11.3-20110730.0]

Information for jpfe:

Comment:

JUNOS Packet Forwarding Engine Support (QFX) [11.3-20110730.0]

Information for jroute:

Comment:

JUNOS Routing Software Suite [11.3-20110730.0]

Information for jswitch:

Comment:

JUNOS Enterprise Software Suite [11.3-20110730.0]

Information for junos:

Comment:

JUNOS Base OS boot [11.3-20110730.0]

Information for jweb:

Comment:

JUNOS Web Management [11.3-20110730.0]

show system statistics

List of Syntax	Syntax on page 269 Syntax (EX Series Switches) on page 269 Syntax (TX Matrix Router) on page 269 Syntax (TX Matrix Plus Router) on page 269 Syntax (MX Series Router) on page 269 Syntax (QFX Series) on page 269
Syntax	show system statistics
Syntax (EX Series Switches)	show system statistics <all-members> <local> <member <i>member-id</i> >
Syntax (TX Matrix Router)	show system statistics <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	show system statistics <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	show system statistics <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show system statistics
Release Information	Command introduced before JUNOS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display system-wide protocol-related statistics.
Options	none —Display system statistics for all the following protocols: <ul style="list-style-type: none"> • arp—Address Resolution Protocol • bridge—IEEE 802.1 Bridging • clns—Connectionless Network Service • esis—End System-to-Intermediate System • ethoamcfm—Ethernet OAM protocol for connectivity fault management

- **ethoamlfm**—Ethernet OAM protocol for link fault management
- **icmp**—Internet Control Message Protocol
- **icmp6**—Internet Control Message Protocol version 6
- **igmp**—Internet Group Management Protocol
- **ip**—Internet Protocol version 4
- **ip6**—Internet Protocol version 6
- **jsr**—Juniper Socket Replication
- **mpls**—Multiprotocol Label Switching
- **rdp**—Reliable Datagram Protocol
- **tcp**—Transmission Control Protocol
- **tnp**—Trivial Network Protocol
- **ttp**—TNP Tunneling Protocol
- **tudp**—Trivial User Datagram Protocol
- **udp**—User Datagram Protocol
- **vpls**—Virtual Private LAN Service

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for all the routers in the chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system statistics for a protocol for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display system statistics for a protocol for all routers (line-card chassis) connected to the TX Matrix Plus router

all-members—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for all members of the Virtual Chassis configuration.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system statistics for a protocol for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system statistics for a protocol for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Display system statistics for a protocol for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

Additional Information By default, when you issue the **show system statistics** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) backup Routing Engines that are connected to it.

Required Privilege Level view

List of Sample Output [show system statistics on page 271](#)
[show system statistics \(EX Series Switches\) on page 281](#)
[show system statistics \(TX Matrix Router\) on page 290](#)
[show system statistics \(QFX Series\) on page 297](#)

Sample Output

show system statistics

```
user@host> show system statistics
ip:
    3682087 total packets received
    0 bad header checksums
    0 with size smaller than minimum
    0 with data size < data length
    0 with header length < data size
    0 with data length < header length
    0 with incorrect version number
```

```
0 packets destined to dead next hop
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped (queue overflow)
0 fragments dropped after timeout
0 fragments dropped due to over limit
0 packets reassembled ok
3664774 packets for this host
17316 packets for unknown/unsupported protocol
0 packets forwarded
0 packets not forwardable
0 redirects sent
6528 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
1123 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
1123 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
icmp:
0 drops due to rate limit
0 calls to icmp_error
0 errors not generated because old message was icmp
Output histogram:
    echo reply: 75
0 messages with bad code fields
0 messages less than the minimum length
0 messages with bad checksum
0 messages with bad source address
0 messages with bad length
0 echo drops with broadcast or multicast destination address
0 timestamp drops with broadcast or multicast destination address
Input histogram:
    echo: 75
    router advertisement: 130
75 message responses generated
tcp:
3844 packets sent
    3618 data packets (1055596 bytes)
    0 data packets (0 bytes) retransmitted
    0 resends initiated by MTU discovery
    205 ack-only packets (148 packets delayed)
    0 URG only packets
    0 window probe packets
    0 window update packets
    1079 control packets
5815 packets received
    3377 acks (for 1055657 bytes)
    24 duplicate acks
```



```

    0 acks for unsent data
    2655 packets (15004 bytes) received in-sequence
    1 completely duplicate packet (0 bytes)
    0 old duplicate packets
    0 packets with some dup. data (0 bytes duped)
    0 out-of-order packets (0 bytes)
    0 packets (0 bytes) of data after window
    0 window probes
    7 window update packets
    0 packets received after close
    0 discarded for bad checksums
    0 discarded for bad header offset fields
    0 discarded because packet too short
1 connection request
32 connection accepts
0 bad connection attempts
0 listen queue overflows
33 connections established (including accepts)
30 connections closed (including 0 drops)
    27 connections updated cached RTT on close
    27 connections updated cached RTT variance on close
    0 connections updated cached ssthresh on close
0 embryonic connections dropped
3374 segments updated rtt (of 3220 attempts)
0 retransmit timeouts
    0 connections dropped by rexmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
344 keepalive timeouts
    0 keepalive probes sent
    0 connections dropped by keepalive
1096 correct ACK header predictions
1314 correct data packet header predictions
32 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    32 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted
    0 badack
    0 unreach
    0 zone failures
0 cookies sent
0 cookies received
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
1058 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
udp:
    3658884 datagrams received
    0 with incomplete header
    0 with bad data length field
    0 with bad checksum

```

```
3657342 dropped due to no socket
3657342 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
4291311496 delivered
1551 datagrams output

ipsec:
0 inbound packets processed successfully
0 inbound packets violated process security policy
0 inbound packets with no SA available
0 invalid inbound packets
0 inbound packets failed due to insufficient memory
0 inbound packets failed getting SPI
0 inbound packets failed on AH replay check
0 inbound packets failed on ESP replay check
0 inbound AH packets considered authentic
0 inbound AH packets failed on authentication
0 inbound ESP packets considered authentic
0 inbound ESP packets failed on authentication
0 outbound packets processed successfully
0 outbound packets violated process security policy
0 outbound packets with no SA available
0 invalid outbound packets
0 outbound packets failed due to insufficient memory
0 outbound packets with no route

igmp:
17186 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid field(s)
0 membership reports received
0 membership reports received with invalid field(s)
0 membership reports received for groups to which we belong
0 membership reports sent

arp:
44181302 datagrams received
2 ARP requests received
2028 ARP replies received
3156 resolution requests received
0 unrestricted proxy requests
0 received proxy requests
0 proxy requests not proxied
0 with bogus interface
787 with incorrect length
712 for non-IP protocol
0 with unsupported op code
0 with bad protocol address length
0 with bad hardware address length
0 with multicast source address
7611 with multicast target address
0 with my own hardware address
14241699 for an address not on the interface
0 with a broadcast source address
0 with source address duplicate to mine
29929250 which were not for me
0 packets discarded waiting for resolution
6 packets sent after waiting for resolution
17812 ARP requests sent
2 ARP replies sent
0 requests for memory denied
```

```

0 requests dropped on entry
0 requests dropped during retry
ip6:
0 total packets received
0 with size smaller than minimum
0 with data size < data length
0 with bad options
0 with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
Mbuf statistics:
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too many headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 packets destined to dead next hop
0 option packets dropped due to rate limit
0 packets dropped (src and int don't match)
0 packets dropped due to bad protocol
icmp6:
0 calls to icmp_error
0 errors not generated because old message was icmp error or so
0 errors not generated because rate limitation
0 messages with bad code fields
0 messages < minimum length
0 bad checksums
0 messages with bad length
Histogram of error messages to be generated:
    0 no route
    0 administratively prohibited
    0 beyond scope
    0 address unreachable
    0 port unreachable
    0 packet too big
    0 time exceed transit
    0 time exceed reassembly
    0 erroneous header field
    0 unrecognized next header
    0 unrecognized option
    0 redirect
    0 unknown
0 message responses generated
0 messages with too many ND options

```

```
ipsec6:
  0 inbound packets processed successfully
  0 inbound packets violated process security policy
  0 inbound packets with no SA available
  0 invalid inbound packets
  0 inbound packets failed due to insufficient memory
  0 inbound packets failed getting SPI
  0 inbound packets failed on AH replay check
  0 inbound packets failed on ESP replay check
  0 inbound AH packets considered authentic
  0 inbound AH packets failed on authentication
  0 inbound ESP packets considered authentic
  0 inbound ESP packets failed on authentication
  0 outbound packets processed successfully
  0 outbound packets violated process security policy
  0 outbound packets with no SA available
  0 invalid outbound packets
  0 outbound packets failed due to insufficient memory
  0 outbound packets with no route

c1nl:
  0 total packets received
  0 packets delivered
  0 too small
  0 bad header length
  0 bad checksum
  0 bad version
  0 unknown or unsupported protocol
  0 bogus sdl size
  0 no free memory in socket buffer
  0 send packets discarded
  0 sbappend failure
  0 mcopy failure
  0 address fields were not reasonable
  0 segment information forgotten
  0 forwarded packets
  0 total packets sent
  0 output packets discarded
  0 non-forwarded packets
  0 packets fragmented
  0 fragments sent
  0 fragments discarded
  0 fragments timed out
  0 fragmentation prohibited
  0 packets reconstructed
  0 packets destined to dead nexthop
  0 packets discarded due to no route
  0 Error pdu rate drops
  0 ER pdu generation failure

esis:
  0 total pkts received
  0 total packets consumed by protocol
  0 pdus received with bad checksum
  0 pdus received with bad version number
  0 pdus received with bad type field
  0 short pdus received
  0 bogus sdl size
  0 bad header length
  0 unknown or unsupported protocol
  0 no free memory in socket buffer
  0 send packets discarded
  0 sbappend failure
```

```

0 mcopy failure
0 ISO family not configured
tnp:
146776365 unicast packets received
0 broadcast packets received
0 fragmented packets received
0 hello packets dropped
0 fragments dropped
0 fragment reassembly queue flushes
0 hello packets received
0 control packets received
49681642 rdp packets received
337175 udp packets received
96757548 tunnel packets received
0 input packets discarded with no protocol
98397591 unicast packets sent
0 broadcast packets sent
0 fragmented packets sent
0 hello packets dropped
0 fragments dropped
0 hello packets sent
0 control packets sent
49681642 rdp packets sent
337175 udp packets sent
48378774 tunnel packets sent
0 packets sent with unknown protocol
rdp:
49681642 input packets
0 discards for bad checksum
0 discards bad sequence number
0 refused connections
2031964 acks received
0 dropped due to full socket buffers
49692 retransmits
49681642 output packets
24815968 acks sent
28 connects
0 closes
22783990 keepalives received
22783990 keepalives sent
tudp:
337175 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
0 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
337175 delivered
337175 datagrams output
ttp:
398749 packets sent
0 packets sent while unconnected
0 packets sent while interface down
0 packets sent couldn't get buffer
0 packets sent couldn't find neighbor
44696687 L2 packets received
0 unknown L3 packets received
3682087 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received

```

```

0 IPv4->MPLS L3 packets received
0 VPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 cyclotron cycle L3 packets received
0 cyclotron send L3 packets received
0 packets received while unconnected
0 packets received from unknown ifl
0 input packets couldn't get buffer
0 input packets with bad type
0 input packets with discard type
0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result
0 input packets for which rt lookup is bypassed

mpls:
0 total mpls packets received
0 packets forwarded
0 packets dropped
0 with header too small
0 after tagging, can't fit link MTU
0 with IPv4 explicit NULL tag
0 with IPv4 explicit NULL cksum errors
0 with router alert tag
0 lsp ping packets (ttl-expired/router alert)
0 with ttl expired
0 with tag encoding error
0 packets discarded, no route

jsr:
  Handle-inf:o
    0 Handles in use
    0 Handles allocated so far
    0 Handles freed so far
    0 Handles in delayed free state
  IHA:
    0 IHA invalid subtype messages
    0 IHA invalid length messages
    0 IHA invalid version messages
    0 IHA too short messages
    0 IHA invalid dst handle messages
    0 IHA invalid src handle messages
    0 IHA unmatched src handle messages
    0 IHA invalid messages for primary
    0 IHA invalid messages for secondary
    0 IHA invalid messages for current state
    0 IHA messages sent for subtype init
    0 IHA messages rcvd for subytpe init
    0 IHA messages sent for subtype init
    0 IHA messages rcvd for subytpe init
    0 IHA messages sent for subtype init
    0 IHA messages rcvd for subytpe init
    0 IHA messages sent for subtype init
    0 IHA messages rcvd for subytpe init
    0 IHA messages sent for subtype init
    0 IHA messages rcvd for subytpe init
    0 IHA message timeouts
    0 IHA socket unreplicate messages

```

SDRL:

```

0 SDRL socket teardowns
0 SDRL socket teardown failures
0 SDRL socket unreplicates
0 SDRL socket unreplicate failures
0 SDRL external timeouts
0 SDRL internal timeouts
0 SDRL ipc messages sent
0 SDRL ipc send failures
0 SDRL ipc messages recvd
0 SDRL ipc messages recvd
0 SDRL primary replication messages sent
0 SDRL primary replication message send failures
0 SDRL primary ack messages received
0 SDRL primary ack message receive failures
0 SDRL primary sock replication inits
0 SDRL primary sock replication init failures
0 SDRL primary throttle remove messages
0 SDRL primary throttle remove failures
0 SDRL primary init handshake messages
0 SDRL primary init handshake failures
0 SDRL secondary replication messages received
0 SDRL secondary replication message receive failures
0 SDRL secondary replication acks sent
0 SDRL secondary replication ack send failures
0 SDRL secondary sock splits
0 SDRL secondary sock split failures
0 SDRL secondary sock merges
0 SDRL secondary sock merge failures
0 SDRL secondary sockets closed
0 SDRL secondary rcv snoop fd close failures
0 SDRL secondary snd snoop fd close failures
0 SDRL secondary init handshake messages
0 SDRL secondary init handshake failures

```

PRL:

```

0 PRL packets enqueued
0 PRL packets failed to enqueue
0 PRL packets dequeued
0 PRL packets failed to dequeue
0 PRL queue entry allocations
0 PRL queue entry frees
0 calls to layer 4 input handlers
0 failed calls to layer 4 input handlers
0 PRL queue drains
0 PRL replication timeouts
0 PRL replication messages sent
0 PRL replication message send failures
0 PRL acknowledgement messages sent
0 PRL acknowledgement message send failures
0 PRL replication messages received
0 PRL replication message receive failures
0 PRL acknowledgement messages received
0 PRL acknowledgement receive failures
0 PRL messages with bad IPC type
0 PRL messages with no handler
2 PRL global state initializations
1 PRL global state cleanups
0 PRL per-socket state creations
0 PRL per-socket state creation failures
0 PRL per-socket state cleanups
0 PRL socket closes

```

```

0 PRL socket merges
0 PRL socket unreplicates
0 PRL primary socket replication initializations
0 PRL secondary socket replication initializations
0 PRL primary socket replication activations
0 PRL secondary socket replication activations
0 packets received from peers
0 PRL packets receive operations from peer failed
0 PRL buffer pullup failures
0 new pkts dropped on secondary socket
PSRM:
0 PSRM replication timeouts
0 PSRM replication messages sent
0 PSRM replication message send failures
0 PSRM acknowledgment messages sent
0 PSRM acknowledgement message send failures
0 PSRM flow control messages sent
0 PSRM flow control message send failures
0 PSRM replication messages received
0 PSRM replication message receive failures
0 PSRM acknowledgment messages received
0 PSRM acknowledgment message receive failures
0 PSRM flow control messages received
0 PSRM flow control message receive failures
0 SRM messages with bad IPC type
0 PSRM messages with no handler
2 PSRM global state initializations
1 PSRM global state cleanups
0 PSRM per-socket state creations
0 PSRM per-socket state creation failures
0 PSRM per-socket state cleanups
0 PSRM socket closes
0 PSRM socket merges
0 PSRM socket unreplicates
0 PSRM primary socket replication initializations
0 psrm-secondary-socket-replication-initializations
0 PSRM primary socket replication activations
0 secondary socket replication activations
0 PSRM tcpcb updates
0 PSRM buffer pullup failures
73 PSRM tcp timestamp msg rcv counters
0 PSRM tcp timestamp msg rcv failures
0 PSRM tcp timestamp msg send counters
0 PSRM tcp timestamp msg send failures
TCP:
0 TCP out-of-order packets on JSR sockets
vpls:
0 total packets received
0 with size smaller than minimum
0 with incorrect version number
0 packets for this host
0 packets with no logical interface
0 packets with no family
0 packets with no route table
0 packets with no auxiliary table
0 packets with no corefacing entry
0 packets with no CE-facing entry
0 mac route learning requests
0 mac routes learnt
0 requests to learn an existing route
0 learning requests while learning disabled on interface

```



```

0 learning requests over capacity
0 mac routes moved
0 requests to move static route
0 mac route aging requests
0 mac routes aged
0 bogus address in aging requests
0 requests to age static route
0 requests to re-ageout aged route
0 requests involving multiple peer FEs
0 aging acks from PFE
0 aging non-acks from PFE
0 aging requests timed out waiting on FEs
0 aging requests over max-rate
0 errors finding peer FEs

```

show system statistics (EX Series Switches)

```
user@host> show system statistics
```

```
Tcp:
```

```

571779 packets sent
    21517 data packets (1797102 bytes)
    2 data packets retransmitted (20 bytes)
    0 resends initiated by MTU discovery
    3708 ack only packets (531 packets delayed)
    0 URG only packets
    1 window probe packets
    1 window update packets
    1093063 control packets
1132541 packets received
    20961 acks(for 1796102 bytes)
    5861 duplicate acks
    0 acks for unsent data
    19556 packets received in-sequence(232079 bytes)
    3018 completely duplicate packets(0 bytes)
    0 old duplicate packets
    4 packets with some duplicate data(4 bytes duped)
    2 out-of-order packets(2 bytes)
    0 packets of data after window(0 bytes)
    0 window probes
    39 window update packets
    0 packets received after close
    0 discarded for bad checksums
    0 discarded for bad header offset fields
    0 discarded because packet too short
546519 connection requests
78 connection accepts
0 bad connection attempts
0 listen queue overflows
100 connections established (including accepts)
546596 connections closed (including 6 drops)
    47 connections updated cached RTT on close
    47 connections updated cached RTT variance on close
    0 connections updated cached ssthresh on close
546497 embryonic connections dropped
20453 segments updated rtt(of 566914 attempts)
2 retransmit timeouts
    0 connections dropped by retransmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
3028 keepalive timeouts
    3027 keepalive probes sent

```

```
        1 connections dropped by keepalive
7515 correct ACK header predictions
12258 correct data packet header predictions
78 syncache entries added
    0 retransmitted
    0 dupsyn
    4 dropped
    78 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted
    0 badack
    0 unreach
    0 zone failures
0 cookies sent
0 cookies received
1 SACK recovery episodes
1 segment retransmits in SACK recovery episodes
1 byte retransmits in SACK recovery episodes
71 SACK options (SACK blocks) received
1 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
546544 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
udp:
    147 datagrams received
    0 with incomplete header
    0 with bad data length field
    0 with bad checksum
    9 dropped due to no socket
    0 broadcast/multicast datagrams dropped due to no socket
    0 dropped due to full socket buffers
    0 not for hashed pcb
    138 delivered
    0 datagrams output
ip:
    73704 total packets received
    0 bad header checksums
    0 with size smaller than minimum
    0 with data size < data length
    0 with header length < data size
    0 with data length < header length
    0 with incorrect version number
    0 packets destined to dead next hop
    0 fragments received
    0 fragments dropped (dup or out of space)
    0 fragments dropped (queue overflow)
    0 fragments dropped after timeout
    0 fragments dropped due to over limit
    0 packets reassembled ok
    1133057 packets for this host
    0 packets for unknown/unsupported protocol
```

```

40146 packets forwarded
0 packets not forwardable
40146 redirects sent
1121700 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
0 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
0 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
0 transit re packets dropped on mgmt i/f
0 packets used first nexthop in ecmp unilist
0 incoming ttpoip packets received
0 incoming ttpoip packets dropped
0 outgoing TTPoIP packets sent
0 outgoing TTPoIP packets dropped
icmp:
0 drops due to rate limit
9 calls to icmp_error
0 errors not generated because old message was icmp
Output histogram:
    295 echo reply
    9 destination unreachable
0 messages with bad code fields
0 messages less than the minimum length
0 messages with bad checksum
0 messages with bad source address
0 messages with bad length
0 echo drops with broadcast or multicast destination address
0 timestamp drops with broadcast or multicast destination address
Input histogram:
    295 echo
295 message responses generated
igmp:
0 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid fields
0 membership reports received
0 membership reports received with invalid fields
0 membership reports received for groups to which we belong
0 Membership reports sent
raw_if:
0 RAW packets transmitted
0 PPPoE packets transmitted
0 ISDN packets transmitted
0 DIALER packets transmitted
0 PPP packets transmitted to pppd

```

```
0 PPP packets transmitted to jppd
0 IGMPv2 packets transmitted
13 output drops due to tx error
0 MPU packets transmitted
0 PPPoE packets received
0 ISDN packets received
0 DIALER packets received
0 PPP packets received from pppd
0 MPU packets received
0 PPP packets received from jppd
0 IGMPv2 packets received
0 Input drops due to bogus protocol
0 input drops due to no mbufs available
0 input drops due to no space in socket
0 input drops due to no socket

arp:
186413 datagrams received
88 ARP requests received
88 ARP replies received
0 resolution request received
0 unrestricted proxy requests
0 restricted proxy requests
0 received proxy requests
0 proxy requests not proxied
0 restricted proxy requests not proxied
0 datagrams with bogus interface
0 datagrams with incorrect length
0 datagrams for non-IP protocol
0 datagrams with unsupported op code
0 datagrams with bad protocol address length
0 datagrams with bad hardware address length
0 datagrams with multicast source address
0 datagrams with multicast source address
0 datagrams with my own hardware address
164 datagrams for an address not on the interface
0 datagrams with a broadcast source address
0 datagrams with source address duplicate to mine
186065 datagrams which were not for me
0 packets discarded waiting for resolution
0 packets sent after waiting for resolution
50 ARP requests sent
88 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry
0 requests dropped due to interface deletion
0 requests on unnumbered interfaces
0 new requests on unnumbered interfaces
0 replies for from unnumbered interfaces
0 requests on unnumbered interface with non-subnetted donor
0 replies from unnumbered interface with non-subnetted donor

ip6:
0 total packets received
0 packets with size smaller than minimum
0 packets with data size < data length
0 packets with bad options
0 packets with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
```

```

0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too many headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 Packets destined to dead next hop
0 option packets dropped due to rate limit
0 Packets dropped (src and int don't match)
0 packets dropped due to bad protocol
0 transit re packet(null) dropped on mgmt i/f

icmp6:
0 Calls to icmp_error
0 Errors not generated because old message was icmp error
0 Errors not generated because rate limitation
0 Messages with bad code fields
0 Messages < minimum length
0 Bad checksums
0 Messages with bad length
    0 No route
    0 Administratively prohibited
    0 Beyond scope
    0 Address unreachable
    0 Port unreachable
    0 packet too big
    0 Time exceed transit
    0 Time exceed reassembly
    0 Erroneous header field
    0 Unrecognized next header
    0 Unrecognized option
    0 redirect
    0 Unknown
0 Message responses generated
0 Messages with too many ND options

pfkey:
0 Requests sent from userland
0 Bytes sent from userland
histogram by message type:
    0 reserved
    0 dump
0 Messages with invalid length field
0 Messages with invalid version field
0 Messages with invalid message type field
0 Messages too short
0 Messages with memory allocation failure
0 Messages with duplicate extension
0 Messages with invalid extension type
0 Messages with invalid sa type

```

```

0 Messages with invalid address extension
0 Requests sent to userland
0 Bytes sent to userland
histogram by message type:
    0 reserved
    0 dump
0 Messages toward single socket
0 Messages toward all sockets
0 Messages toward registered sockets
0 Messages with memory allocation failure
c1n1:
0 Total packets received
0 Packets delivered
0 Too small packets
0 Packets with bad header length
0 Packets with bad checksum
0 Bad version packets
0 Unknown or unsupported protocol packets
0 Packets with bogus sdl size
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 Address fields were not reasonable
0 Segment information forgotten
0 Forwarded packets
0 Total packets sent
0 Output packets discarded
0 Non-forwarded packets
0 Packets fragmented
0 Fragments sent
0 Fragments discarded
0 Fragments timed out
0 Fragmentation prohibited
0 Packets reconstructed
0 Packets destined to dead nexthop
0 Packets discarded due to no route
0 Error pdu rate drops
    0 ER pdu generation failure
esis:
0 Total pkts received
0 Total packets consumed by protocol
0 Pdus received with bad checksum
0 Pdus received with bad version number
0 Pdus received with bad type field
0 Short pdus received
0 Pdus with bogus sdl size
0 Pdus with bad header length
0 Pdus with unknown or unsupported protocol
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 ISO family not configured
tnp:
0 Unicast packets received
0 Broadcast packets received
0 Fragmented packets received
0 Hello packets dropped
0 Fragments dropped
0 Fragment reassembly queue flushes

```

```

0 Packets with tnp src address collision received
0 Hello packets received
0 Control packets received
0 Rdp packets received
0 Udp packets received
0 Tunnel packets received
0 Input packets discarded with no protocol
0 Packets of version unspecified received
0 Packets of version 1 received
0 Packets of version 2 received
0 Packets of version 3 received
0 Unicast packets sent
0 Broadcast packets sent
0 Fragmented packets sent
0 Hello packets dropped
0 Fragments dropped
0 Hello packets sent
0 Control packets sent
0 Rdp packets sent
0 Udp packets sent
0 Tunnel packets sent
0 Packets sent with unknown protocol
0 Packets of version unspecified sent
0 Packets of version 1 sent
0 Packets of version 2 sent
0 Packets of version 3 sent
rdp:
0 Input packets
0 Packets discarded for bad checksum
0 Packets discarded due to bad sequence number
0 Refused connections
0 Acks received
0 Packets dropped due to full socket buffers
0 Retransmits
0 Output packets
0 Acks sent
0 Connects
0 Closes
0 Keepalives received
0 Keepalives sent
tudp:
67 Datagrams received
0 Datagrams with incomplete header
0 Datagrams with bad data length field
0 Datagrams with bad checksum
0 Datagrams dropped due to no socket
0 Broadcast/multicast datagrams dropped due to no socket
0 Datagrams dropped due to full socket buffers
67 Delivered
68 Datagrams output
ttp:
0 Packets sent
0 Packets sent while unconnected
0 Packets sent while interface down
0 Packets sent couldn't get buffer
0 Packets sent couldn't find neighbor
0 L2 packets received
0 Unknown L3 packets received
0 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received

```

```
0 IPv4->MPLS L3 packets received
0 VPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 Cyclotron cycle L3 packets received
0 Cyclotron send L3 packets received
0 Packets received while unconnected
0 Packets received from unknown ifl
0 Input packets couldn't get buffer
0 Input packets with bad type
0 Input packets with discard type
0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result
0 Input packets for which rt lookup is bypassed

mpls:
0 Total MPLS packets received
0 Packets forwarded
0 Packets dropped
0 Packets with header too small
0 After tagging, packets can't fit link MTU
0 Packets with IPv4 explicit NULL tag
0 Packets with IPv4 explicit NULL cksum errors
0 Packets with router alert tag
0 LSP ping packets (ttl-expired/router alert)
0 Packets with ttl expired
0 Packets with tag encoding error
0 Packets discarded due to no route
0 Packets used first nexthop in ecmp unilist
0 Packets dropped due to ifl down

vpls:
0 Total packets received
0 Packets with size smaller than minimum
0 Packets with incorrect version number
0 Packets for this host
0 Packets with no logical interface
0 Packets with no family
0 Packets with no route table
0 Packets with no auxiliary table
0 Packets with no corefacing entry
0 packets with no CE-facing entry
0 MAC route learning requests
0 MAC routes learnt
0 Requests to learn an existing route
0 Learning requests while learning disabled on interface
0 Learning requests over capacity
0 MAC routes moved
0 Requests to move static route
0 MAC route aging requests
0 MAC routes aged
0 Bogus address in aging requests
0 Requests to age static route
0 Requests to re-ageout aged route
0 Requests involving multiple peer FEs
0 Aging acks from PFE
0 Aging non-acks from PFE
```



```

0 Aging requests timed out waiting on FEs
0 Aging requests over max-rate
0 Errors finding peer FEs
0 Unsupported platform
0 Packets dropped due to no l3 route table
0 Packets dropped due to no local ifl
0 Packets punted
0 Packets dropped due to no socket
bridge:
Input:
0 packets received
0 packets forwarded
0 packets failed to forward
0 packets dropped
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with stp state lookup failures
0 packets dropped due to stp blocked/listening
0 packets dropped due to stp learning
0 packets with src MAC learning failures
0 packets with input control processing failures
Forward:
0 packets sent successfully
0 packets with send failures
0 packets forwarded to l3 interface
0 packets with l3 send failures
0 packets discarded
0 packets with l2ifl store failures
0 packets with ifl mismatch failures
0 packets with packet duplication failures
0 packets with tag lookup failures
0 packets with no route for DMAC
0 packets with no route table
0 packets with no nexthop
0 packets with dead nexthop
0 packets with eof reached error
Learning:
0 MACs learned
0 packets sent to l3 interface
0 packets with l3 send failures
0 packets hit holdq while learning
0 MAC moves
0 packets discarded
0 packets with no route for SMAC
0 packets with no nexthop
0 packets with dead nexthop
0 packets dropped due to no resolve route
0 packets with l3 ifd lookup failures
0 packets with l3 ifl lookup failures
0 packets with l3 invalid rnh
0 packets with no route for SMAC in clone learning
0 packets with no nexthop in clone learning
0 packets with dead nexthop in clone learning
0 packets dropped due to no resolve nh in clone learning
Output:
0 packets forwarded
0 packets failed to forward
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with input control processing failures
Send:

```

```
0 packets sent successfully
0 packets with send failures
0 packets dropped due to interface down
0 packets with dev output failures
0 blocked ifl discards
0 packets with tag lookup failures
0 packets with stp state lookup failures
0 packets with tag insertion failures
0 packets with tag removal failures
Flood:
0 packets flooded
0 flood failures
IGMP:
0 packets sent successfully
0 packets with send failures
0 packets forwarded
0 packets failed to forward
0 packets with mpull failures
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with ifl lookup failures
0 packets with tag lookup failures
Misc:
0 packets with size smaller than minimum
0 packets with double tags
0 packets with no ifl
0 packets with no family
0 packets with no route table
```

show system statistics (TX Matrix Router)

```
user@host> show system statistics
sfc0-re0:
```

```
-----
Tcp:
361694 packets sent
  326507 data packets (103237236 bytes)
  2343 data packets retransmitted (2673324 bytes)
  0 resends initiated by MTU discovery
  33857 ack only packets (31613 packets delayed)
  0 URG only packets
  14 window probe packets
  387 window update packets
  1108 control packets
345879 packets received
  298207 acks(for 103141728 bytes)
  438 duplicate acks
  0 acks for unsent data
  204578 packets received in-sequence(13820995 bytes)
  6 completely duplicate packets(18 bytes)
  0 old duplicate packets
  0 packets with some duplicate data(0 bytes duped)
  0 out-of-order packets(0 bytes)
  0 packets of data after window(0 bytes)
  0 window probes
  899 window update packets
  166 packets received after close
  0 discarded for bad checksums
  0 discarded for bad header offset fields
  0 discarded because packet too short
406 connection requests
```

```

233 connection accepts
0 bad connection attempts
0 listen queue overflows
616 connections established (including accepts)
911 connections closed (including 41 drops)
    346 connections updated cached RTT on close
    346 connections updated cached RTT variance on close
    200 connections updated cached ssthresh on close
23 embryonic connections dropped
298155 segments updated rtt(of 287216 attempts)
1163 retransmit timeouts
    27 connections dropped by retransmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
5 keepalive timeouts
    5 keepalive probes sent
    0 connections dropped by keepalive
69922 correct ACK header predictions
34993 correct data packet header predictions
233 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    233 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted
    0 badack
    0 unreach
    0 zone failures
0 cookies sent
0 cookies received
23 SACK recovery episodes
68 segment retransmits in SACK recovery episodes
71542 byte retransmits in SACK recovery episodes
158 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
259 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

lcc0-re0:

 Tcp:

```

346 packets sent
    222 data packets (22894 bytes)
    0 data packets retransmitted (0 bytes)
    0 resends initiated by MTU discovery
    80 ack only packets (12 packets delayed)
    0 URG only packets
    0 window probe packets
    5 window update packets

```

```

    42 control packets
358 packets received
    268 acks(for 22939 bytes)
    9 duplicate acks
    0 acks for unsent data
    203 packets received in-sequence(33820 bytes)
    0 completely duplicate packets(0 bytes)
    0 old duplicate packets
    0 packets with some duplicate data(0 bytes duped)
    0 out-of-order packets(0 bytes)
    0 packets of data after window(0 bytes)
    0 window probes
    6 window update packets
    0 packets received after close
    0 discarded for bad checksums
    0 discarded for bad header offset fields
    0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
35 connections closed (including 2 drops)
    3 connections updated cached RTT on close
    3 connections updated cached RTT variance on close
    0 connections updated cached ssthresh on close
0 embryonic connections dropped
268 segments updated rtt(of 247 attempts)
0 retransmit timeouts
    0 connections dropped by retransmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
0 keepalive timeouts
    0 keepalive probes sent
    0 connections dropped by keepalive
0 correct ACK header predictions
42 correct data packet header predictions
18 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    18 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted
    0 badack
    0 unreach
    0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
```

```

0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

```
lcc1-re0:
```

```
-----
Tcp:
```

```

348 packets sent
    223 data packets (22895 bytes)
    0 data packets retransmitted (0 bytes)
    0 resends initiated by MTU discovery
    81 ack only packets (13 packets delayed)
    0 URG only packets
    0 window probe packets
    5 window update packets
    42 control packets
360 packets received
    269 acks(for 22940 bytes)
    9 duplicate acks
    0 acks for unsent data
    203 packets received in-sequence(33820 bytes)
    0 completely duplicate packets(0 bytes)
    0 old duplicate packets
    0 packets with some duplicate data(0 bytes duped)
    0 out-of-order packets(0 bytes)
    0 packets of data after window(0 bytes)
    0 window probes
    6 window update packets
    0 packets received after close
    0 discarded for bad checksums
    0 discarded for bad header offset fields
    0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
36 connections closed (including 2 drops)
    3 connections updated cached RTT on close
    3 connections updated cached RTT variance on close
    0 connections updated cached ssthresh on close
0 embryonic connections dropped
269 segments updated rtt(of 248 attempts)
0 retransmit timeouts
    0 connections dropped by retransmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
0 keepalive timeouts
    0 keepalive probes sent
    0 connections dropped by keepalive
0 correct ACK header predictions
43 correct data packet header predictions
18 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    18 completed
    0 bucket overflow

```

```
0 cache overflow
0 reset
0 stale
0 aborted
0 badack
0 unreach
0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
```

lcc2-re0:

Tcp:

```
405 packets sent
  271 data packets (23926 bytes)
  0 data packets retransmitted (0 bytes)
  0 resends initiated by MTU discovery
  86 ack only packets (13 packets delayed)
  0 URG only packets
  0 window probe packets
  5 window update packets
  46 control packets
418 packets received
  321 acks(for 23975 bytes)
  9 duplicate acks
  0 acks for unsent data
  234 packets received in-sequence(34403 bytes)
  0 completely duplicate packets(0 bytes)
  0 old duplicate packets
  0 packets with some duplicate data(0 bytes duped)
  0 out-of-order packets(0 bytes)
  0 packets of data after window(0 bytes)
  0 window probes
  7 window update packets
  0 packets received after close
  0 discarded for bad checksums
  0 discarded for bad header offset fields
  0 discarded because packet too short
15 connection requests
19 connection accepts
0 bad connection attempts
0 listen queue overflows
34 connections established (including accepts)
39 connections closed (including 2 drops)
  4 connections updated cached RTT on close
  4 connections updated cached RTT variance on close
```

```

    0 connections updated cached ssthresh on close
0 embryonic connections dropped
321 segments updated rtt(of 299 attempts)
0 retransmit timeouts
    0 connections dropped by retransmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
0 keepalive timeouts
    0 keepalive probes sent
    0 connections dropped by keepalive
0 correct ACK header predictions
48 correct data packet header predictions
19 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    19 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted
    0 badack
    0 unreach
    0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

lcc3-re0:

 Tcp:

```

346 packets sent
    221 data packets (22895 bytes)
    0 data packets retransmitted (0 bytes)
    0 resends initiated by MTU discovery
    81 ack only packets (13 packets delayed)
    0 URG only packets
    0 window probe packets
    5 window update packets
    42 control packets
360 packets received
    267 acks(for 22940 bytes)
    9 duplicate acks
    0 acks for unsent data
    203 packets received in-sequence(33820 bytes)
    0 completely duplicate packets(0 bytes)

```

```
    0 old duplicate packets
    0 packets with some duplicate data(0 bytes duped)
    0 out-of-order packets(0 bytes)
    0 packets of data after window(0 bytes)
    0 window probes
    6 window update packets
    0 packets received after close
    0 discarded for bad checksums
    0 discarded for bad header offset fields
    0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
35 connections closed (including 2 drops)
    3 connections updated cached RTT on close
    3 connections updated cached RTT variance on close
    0 connections updated cached ssthresh on close
0 embryonic connections dropped
267 segments updated rtt(of 246 attempts)
0 retransmit timeouts
    0 connections dropped by retransmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
0 keepalive timeouts
    0 keepalive probes sent
    0 connections dropped by keepalive
0 correct ACK header predictions
43 correct data packet header predictions
18 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    18 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted
    0 badack
    0 unreach
    0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
```


show system statistics (QFX Series)

```

user@switch> show system statistics
Tcp:
571779 packets sent
21517 data packets (1797102 bytes)
2 data packets retransmitted (20 bytes)
0 resends initiated by MTU discovery
3708 ack only packets (531 packets delayed)
0 URG only packets
1 window probe packets
1 window update packets
1093063 control packets
1132541 packets received
20961 acks(for 1796102 bytes)
5861 duplicate acks
0 acks for unsent data
19556 packets received in-sequence(232079 bytes)
3018 completely duplicate packets(0 bytes)
0 old duplicate packets
4 packets with some duplicate data(4 bytes duped)
2 out-of-order packets(2 bytes)
0 packets of data after window(0 bytes)
0 window probes
39 window update packets
0 packets received after close
0 discarded for bad checksums
0 discarded for bad header offset fields
0 discarded because packet too short
546519 connection requests
78 connection accepts
0 bad connection attempts
0 listen queue overflows
100 connections established (including accepts)
546596 connections closed (including 6 drops)
47 connections updated cached RTT on close
47 connections updated cached RTT variance on close
0 connections updated cached ssthresh on close
546497 embryonic connections dropped
20453 segments updated rtt(of 566914 attempts)
2 retransmit timeouts
0 connections dropped by retransmit timeout
0 persist timeouts
0 connections dropped by persist timeout
3028 keepalive timeouts
3027 keepalive probes sent
1 connections dropped by keepalive
7515 correct ACK header predictions
12258 correct data packet header predictions
78 syncache entries added
0 retransmitted
0 dupsyn
4 dropped
78 completed
0 bucket overflow
0 cache overflow
0 reset
0 stale
0 aborted
0 badack

```

```
0 unreachable
0 zone failures
0 cookies sent
0 cookies received
1 SACK recovery episodes
1 segment retransmits in SACK recovery episodes
1 byte retransmits in SACK recovery episodes
71 SACK options (SACK blocks) received
1 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
546544 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
udp:
147 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
9 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
138 delivered
0 datagrams output
ip:
73704 total packets received
0 bad header checksums
0 with size smaller than minimum
0 with data size < data length
0 with header length < data size
0 with data length < header length
0 with incorrect version number
0 packets destined to dead next hop
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped (queue overflow)
0 fragments dropped after timeout
0 fragments dropped due to over limit
0 packets reassembled ok
1133057 packets for this host
0 packets for unknown/unsupported protocol
40146 packets forwarded
0 packets not forwardable
40146 redirects sent
1121700 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
0 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
```

```

0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
0 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
0 transit re packets dropped on mgmt i/f
0 packets used first nexthop in ecmp unilist
0 incoming ttpoip packets received
0 incoming ttpoip packets dropped
0 outgoing TTPoIP packets sent
0 outgoing TTPoIP packets dropped
icmp:
0 drops due to rate limit
9 calls to icmp_error
0 errors not generated because old message was icmp
Output histogram:
295 echo reply
9 destination unreachable
0 messages with bad code fields
0 messages less than the minimum length
0 messages with bad checksum
0 messages with bad source address
0 messages with bad length
0 echo drops with broadcast or multicast destination address
0 timestamp drops with broadcast or multicast destination address
Input histogram:
295 echo
295 message responses generated
igmp:
0 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid fields
0 membership reports received
0 membership reports received with invalid fields
0 membership reports received for groups to which we belong
0 Membership reports sent
raw_if:
0 RAW packets transmitted
0 PPPOE packets transmitted
0 ISDN packets transmitted
0 DIALER packets transmitted
0 PPP packets transmitted to pppd
0 PPP packets transmitted to jppd
0 IGMP2 packets transmitted
13 output drops due to tx error
0 MPU packets transmitted
0 PPPOE packets received
0 ISDN packets received
0 DIALER packets received
0 PPP packets received from pppd
0 MPU packets received
0 PPP packets received from jppd
0 IGMP2 packets received
0 Input drops due to bogus protocol
0 input drops due to no mbufs available
0 input drops due to no space in socket

```

```
0 input drops due to no socket
arp:
186413 datagrams received
88 ARP requests received
88 ARP replies received
0 resolution request received
0 unrestricted proxy requests
0 restricted proxy requests
0 received proxy requests
0 proxy requests not proxied
0 restricted proxy requests not proxied
0 datagrams with bogus interface
0 datagrams with incorrect length
0 datagrams for non-IP protocol
0 datagrams with unsupported op code
0 datagrams with bad protocol address length
0 datagrams with bad hardware address length
0 datagrams with multicast source address
0 datagrams with multicast source address
0 datagrams with my own hardware address
164 datagrams for an address not on the interface
0 datagrams with a broadcast source address
0 datagrams with source address duplicate to mine
186065 datagrams which were not for me
0 packets discarded waiting for resolution
0 packets sent after waiting for resolution
50 ARP requests sent
88 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry
0 requests dropped due to interface deletion
0 requests on unnumbered interfaces
0 new requests on unnumbered interfaces
0 replies for from unnumbered interfaces
0 requests on unnumbered interface with non-subnetted donor
0 replies from unnumbered interface with non-subnetted donor
ip6:
0 total packets received
0 packets with size smaller than minimum
0 packets with data size < data length
0 packets with bad options
0 packets with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
0 packets whose headers are not continuous
```

```

0 tunneling packets that can't find gif
0 packets discarded due to too may headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 Packets destined to dead next hop
0 option packets dropped due to rate limit
0 Packets dropped (src and int don't match)
0 packets dropped due to bad protocol
0 transit re packet(null) dropped on mgmt i/f
icmp6:
0 Calls to icmp_error
0 Errors not generated because old message was icmp error
0 Errors not generated because rate limitation
0 Messages with bad code fields
0 Messages < minimum length
0 Bad checksums
0 Messages with bad length
0 No route
0 Administratively prohibited
0 Beyond scope
0 Address unreachable
0 Port unreachable
0 packet too big
0 Time exceed transit
0 Time exceed reassembly
0 Erroneous header field
0 Unrecognized next header
0 Unrecognized option
0 redirect
0 Unknown
0 Message responses generated
0 Messages with too many ND options
pfkey:
0 Requests sent from userland
0 Bytes sent from userland
histogram by message type:
0 reserved
0 dump
0 Messages with invalid length field
0 Messages with invalid version field
0 Messages with invalid message type field
0 Messages too short
0 Messages with memory allocation failure
0 Messages with duplicate extension
0 Messages with invalid extension type
0 Messages with invalid sa type
0 Messages with invalid address extension
0 Requests sent to userland
0 Bytes sent to userland
histogram by message type:
0 reserved
0 dump
0 Messages toward single socket
0 Messages toward all sockets
0 Messages toward registered sockets
0 Messages with memory allocation failure
c1n1:
0 Total packets received
0 Packets delivered
0 Too small packets

```

```
0 Packets with bad header length
0 Packets with bad checksum
0 Bad version packets
0 Unknown or unsupported protocol packets
0 Packets with bogus sdl size
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 Address fields were not reasonable
0 Segment information forgotten
0 Forwarded packets
0 Total packets sent
0 Output packets discarded
0 Non-forwarded packets
0 Packets fragmented
0 Fragments sent
0 Fragments discarded
0 Fragments timed out
0 Fragmentation prohibited
0 Packets reconstructed
0 Packets destined to dead nexthop
0 Packets discarded due to no route
0 Error pdu rate drops
0 ER pdu generation failure
esis:
0 Total pkts received
0 Total packets consumed by protocol
0 Pdus received with bad checksum
0 Pdus received with bad version number
0 Pdus received with bad type field
0 Short pdus received
0 Pdus with bogus sdl size
0 Pdus with bad header length
0 Pdus with unknown or unsupported protocol
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 ISO family not configured
tnp:
0 Unicast packets received
0 Broadcast packets received
0 Fragmented packets received
0 Hello packets dropped
0 Fragments dropped
0 Fragment reassembly queue flushes
0 Packets with tnp src address collision received
0 Hello packets received
0 Control packets received
0 Rdp packets received
0 Udp packets received
0 Tunnel packets received
0 Input packets discarded with no protocol
0 Packets of version unspecified received
0 Packets of version 1 received
0 Packets of version 2 received
0 Packets of version 3 received
0 Unicast packets sent
0 Broadcast packets sent
0 Fragmented packets sent
```

```
0 Hello packets dropped
0 Fragments dropped
0 Hello packets sent
0 Control packets sent
0 Rdp packets sent
0 Udp packets sent
0 Tunnel packets sent
0 Packets sent with unknown protocol
0 Packets of version unspecified sent
0 Packets of version 1 sent
0 Packets of version 2 sent
0 Packets of version 3 sent
rdp:
0 Input packets
0 Packets discarded for bad checksum
0 Packets discarded due to bad sequence number
0 Refused connections
0 Acks received
0 Packets dropped due to full socket buffers
0 Retransmits
0 Output packets
0 Acks sent
0 Connects
0 Closes
0 Keepalives received
0 Keepalives sent
tudp:
67 Datagrams received
0 Datagrams with incomplete header
0 Datagrams with bad data length field
0 Datagrams with bad checksum
0 Datagrams dropped due to no socket
0 Broadcast/multicast datagrams dropped due to no socket
0 Datagrams dropped due to full socket buffers
67 Delivered
68 Datagrams output
ttp:
0 Packets sent
0 Packets sent while unconnected
0 Packets sent while interface down
0 Packets sent couldn't get buffer
0 Packets sent couldn't find neighbor
0 L2 packets received
0 Unknown L3 packets received
0 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received
0 IPv4->MPLS L3 packets received
0 VPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 Cyclotron cycle L3 packets received
0 Cyclotron send L3 packets received
0 Packets received while unconnected
0 Packets received from unknown ifl
0 Input packets couldn't get buffer
0 Input packets with bad type
0 Input packets with discard type
```

```
0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result0 Input packets for which rt lookup
  is bypassed
mpls:
0 Total MPLS packets received
0 Packets forwarded
0 Packets dropped
0 Packets with header too small
0 After tagging, packets can't fit link MTU
0 Packets with IPv4 explicit NULL tag
0 Packets with IPv4 explicit NULL cksum errors
0 Packets with router alert tag
0 LSP ping packets (ttl-expired/router alert)
0 Packets with ttl expired
0 Packets with tag encoding error
0 Packets discarded due to no route
0 Packets used first nexthop in ecmp unilist
0 Packets dropped due to ifl down
vpls:
0 Total packets received
0 Packets with size smaller than minimum
0 Packets with incorrect version number
0 Packets for this host
0 Packets with no logical interface
0 Packets with no family
0 Packets with no route table
582 Copyright © 2010, Juniper Networks, Inc.
0 Packets with no auxiliary table
0 Packets with no corefacing entry
0 packets with no CE-facing entry
0 MAC route learning requests
0 MAC routes learnt
0 Requests to learn an existing route
0 Learning requests while learning disabled on interface
0 Learning requests over capacity
0 MAC routes moved
0 Requests to move static route
0 MAC route aging requests
0 MAC routes aged
0 Bogus address in aging requests
0 Requests to age static route
0 Requests to re-ageout aged route
0 Requests involving multiple peer FEs
0 Aging acks from PFE
0 Aging non-acks from PFE
0 Aging requests timed out waiting on FEs
0 Aging requests over max-rate
0 Errors finding peer FEs
0 Unsupported platform
0 Packets dropped due to no l3 route table
0 Packets dropped due to no local ifl
0 Packets punted
0 Packets dropped due to no socket
bridge:
Input:
0 packets received
0 packets forwarded
0 packets failed to forward
0 packets dropped
```



```
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with stp state lookup failures
0 packets dropped due to stp blocked/listening
0 packets dropped due to stp learning
0 packets with src MAC learning failures
0 packets with input control processing failures
Forward:
0 packets sent successfully
0 packets with send failures
0 packets forwarded to l3 interface
0 packets with l3 send failures
0 packets discarded
0 packets with l2ifl store failures
0 packets with ifl mismatch failures
0 packets with packet duplication failures
0 packets with tag lookup failures
0 packets with no route for DMAC
0 packets with no route table
0 packets with no nexthop
0 packets with dead nexthop
0 packets with eof reached error
Learning:
0 MACs learned
0 packets sent to l3 interface
0 packets with l3 send failures
0 packets hit holdq while learning
0 MAC moves
0 packets discarded
0 packets with no route for SMAC
0 packets with no nexthop
0 packets with dead nexthop
0 packets dropped due to no resolve route
0 packets with l3 ifd lookup failures
0 packets with l3 ifl lookup failures
0 packets with l3 invalid rnh
0 packets with no route for SMAC in clone learning
0 packets with no nexthop in clone learning
0 packets with dead nexthop in clone learning
0 packets dropped due to no resolve nh in clone learning
Output:
0 packets forwarded
0 packets failed to forward
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with input control processing failures
Send:
0 packets sent successfully
0 packets with send failures
0 packets dropped due to interface down
0 packets with dev output failures
0 blocked ifl discards
0 packets with tag lookup failures
0 packets with stp state lookup failures
0 packets with tag insertion failures
0 packets with tag removal failures
Flood:
0 packets flooded
0 flood failures
IGMP:
0 packets sent successfully
```

```
0 packets with send failures
0 packets forwarded
0 packets failed to forward
0 packets with mpull failures
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with ifl lookup failures
0 packets with tag lookup failures
Misc:
0 packets with size smaller than minimum
0 packets with double tags
0 packets with no ifl
0 packets with no family
0 packets with no route table
```

show system storage

List of Syntax	Syntax on page 307 Syntax (EX Series Switches) on page 307 Syntax (MX Series Router) on page 307 Syntax (QFX Series) on page 307 Syntax (SRX Series) on page 307 Syntax (TX Matrix Router) on page 307 Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs) on page 307
Syntax	<pre>show system storage <detail> <invoke-on (all-routing-engines other-routing-engine)></pre>
Syntax (EX Series Switches)	<pre>show system storage <detail> <all-members> <local> <member member-id> <invoke-on (all-routing-engines other-routing-engine)></pre>
Syntax (MX Series Router)	<pre>show system storage <detail> <all-members> <local> <member member-id> <invoke-on (all-routing-engines other-routing-engine)></pre>
Syntax (QFX Series)	<pre>show system storage <detail> <infrastructure name> <interconnect-device name> <node-group name> <invoke-on (all-routing-engines other-routing-engine)></pre>
Syntax (SRX Series)	<pre>show system storage <detail> <partitions> <invoke-on (all-routing-engines other-routing-engine)></pre>
Syntax (TX Matrix Router)	<pre>show system storage <detail> <all-chassis all-lcc lcc number scc> <invoke-on (all-routing-engines other-routing-engine)></pre>
Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs)	<pre>show system storage <detail> <all-chassis all-lcc lcc number sfc number> <invoke-on (all-routing-engines other-routing-engine)></pre>

Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Option invoke-on (all-routing-engines other-routing-engine) introduced in Junos OS Release 14.1</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>Output upgraded for devices running Junos OS with upgraded FreeBSD in Junos OS Release 18.1R1.</p>
Description	<p>Display statistics about the amount of free disk space in the router's or switch's file systems.</p>
Options	<p>none—Display standard information about the amount of free disk space in the router's or switch's file systems.</p> <p>detail—(Optional) Display detailed output.</p> <p>invoke-on all-routing-engines—(Optional) Display the system storage information on all master and backup Routing Engines on a routing matrix based on the TX Matrix or TX Matrix Plus router or on a router that has dual Routing Engines.</p> <p>invoke-on other-routing-engines—(Optional) Display the system storage information on the other Routing Engine. For example, if you issue this command on the master Routing Engine on an M320 router, the JUNOS Software displays the system storage information on the backup Routing Engine. On a routing matrix based on the TX Matrix or TX Matrix Plus router, if you issue this command on the TX Matrix or TX Matrix Plus router's master Routing Engine, the JUNOS Software displays all the system storage information on all the backup Routing Engines.</p> <p>all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system storage statistics for all the routers in the chassis.</p> <p>all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for all routers connected to the TX Matrix Plus router.</p> <p>all-members—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for all members of the Virtual Chassis configuration.</p> <p>infrastructure name—(QFabric systems only) (Optional) Display system storage statistics for the fabric control Routing Engines or fabric manager Routing Engines.</p> <p>interconnect-device name—(QFabric systems only) (Optional) Display system storage statistics for the Interconnect device.</p> <p>lcc number—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for a specific router that is connected to the TX Matrix Plus router.</p>

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

node-group *name*—(QFabric systems only) (Optional) Display system storage statistics for the Node group.

scc—(TX Matrix routers only) (Optional) Display system storage statistics for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display system storage statistics for the TX Matrix Plus router. Replace *number* with 0.

Additional Information By default, when you issue the **show system storage** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

In Junos OS Release 15.1, when certain platforms switched to Junos OS with upgraded FreeBSD, there was a change in the file system used to the UNIX file system (UFS). This change led to the output of the **show system storage** command being long and difficult to use to determine the free space available on the system. Starting in Junos OS Release 18.1R1, the output of this command has been upgraded to be more concise and readable. To determine affected platforms, see [Feature Explorer](#) and enter **FreeBSD 10 kernel for Junos OS**.

Required Privilege Level view

- Related Documentation**
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)
 - [show system storage partitions](#)

- List of Sample Output**
- [show system storage on page 310](#)
 - [show system storage \(Junos OS with upgraded FreeBSD starting in Junos OS Release 18.1R1\) on page 311](#)
 - [show system storage \(TX Matrix Plus Router\) on page 311](#)
 - [show system storage \(QFX3500 Switch\) on page 313](#)
 - [show system storage invoke-on all-routing-engines on page 313](#)
 - [show system storage invoke-on other-routing-engine on page 314](#)

- Output Fields** [Table 10 on page 310](#) describes the output fields for the **show system storage** command. Output fields are listed in the approximate order in which they appear.

Table 10: show system storage Output Fields

Field Name	Field Description
Filesystem	Name of the filesystem.
Size	Size of the filesystem.
Used	Amount of space used in the filesystem.
Avail	Amount of space available in the filesystem.
Capacity	Percentage of the filesystem space that is being used.
Mounted on	Directory in which the filesystem is mounted.

Sample Output

show system storage

```

user@host> show system storage
Filesystem      Size      Used      Avail  Capacity  Mounted on
/dev/ad0s1a      77M       37M       34M      52%      /
devfs           16K       16K        0B     100%    /dev/
/dev/vn0        12M       12M        0B     100%    /packages/mnt/jbase
/dev/vn1        39M       39M        0B     100%
/packages/mnt/jkernel-7.2R1.7
/dev/vn2        12M       12M        0B     100%
/packages/mnt/jpfe-M40-7.2R1.7
/dev/vn3        2.3M      2.3M        0B     100%
/packages/mnt/jdocs-7.2R1.7
/dev/vn4        14M       14M        0B     100%
/packages/mnt/jroute-7.2R1.7
/dev/vn5        4.5M      4.5M        0B     100%
/packages/mnt/jcrypto-7.2R1.7
mfs:172         1.5G      4.0K      1.3G      0%      /tmp
/dev/ad0s1e     12M       20K       11M      0%      /config

```

```

procfs          4.0K      4.0K      0B      100% /proc
/dev/ad1s1f     9.4G      4.9G      3.7G      57%  /var

```

show system storage (Junos OS with upgraded FreeBSD starting in Junos OS Release 18.1R1)

```

user@host> show system storage
Filesystem      Size    Used    Avail Capacity  Mounted on
/dev/gpt/oam     945M    663M    207M     76%
/dev/gpt/junos   32G     14G     16G     46%  /.mount
tmpfs           5.4G     12K    5.4G      0%  /.mount/tmp
tmpfs           592M     1.2M   591M      0%  /.mount/mfs

```

show system storage (TX Matrix Plus Router)

```

user@host> show system storage
sfc0-re0:
-----
Filesystem      Size    Used    Avail Capacity  Mounted on
/dev/ad0s1a     3.4G    178M    2.9G      6%  /
devfs           1.0K    1.0K      0B     100% /dev
devfs           1.0K    1.0K      0B     100% /dev/
/dev/md0        33M     33M      0B     100% /packages/mnt/jbase
/dev/md1       216M    216M      0B     100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2        66M     66M      0B     100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3        4.1M    4.1M      0B     100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4        57M     57M      0B     100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5        15M     15M      0B     100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6        34M     34M      0B     100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7        2.0G    10.0K    1.8G      0%  /tmp
/dev/md8        2.0G     1.0M    1.8G      0%  /mfs
/dev/ad0s1e     383M     82K    352M      0%  /config
procfs          4.0K    4.0K      0B     100% /proc
/dev/ad1s1f     52G     7.5G    40G     16%  /var

lcc0-re0:
-----
Filesystem      Size    Used    Avail Capacity  Mounted on
/dev/ad0s1a     3.4G    178M    2.9G      6%  /
devfs           1.0K    1.0K      0B     100% /dev
devfs           1.0K    1.0K      0B     100% /dev/
/dev/md0        33M     33M      0B     100% /packages/mnt/jbase
/dev/md1       216M    216M      0B     100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2        66M     66M      0B     100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3        4.1M    4.1M      0B     100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4        57M     57M      0B     100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5        15M     15M      0B     100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6        34M     34M      0B     100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7        2.0G    10.0K    1.8G      0%  /tmp

```

/dev/md8	2.0G	540K	1.8G	0%	/mfs
/dev/ad0s1e	383M	88K	352M	0%	/config
procfs	4.0K	4.0K	0B	100%	/proc
/dev/ad1s1f	52G	6.3G	41G	13%	/var

lcc1-re0:

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/ad0s1a	3.4G	178M	2.9G	6%	/
devfs	1.0K	1.0K	0B	100%	/dev
devfs	1.0K	1.0K	0B	100%	/dev/
/dev/md0	33M	33M	0B	100%	/packages/mnt/jbase
/dev/md1	216M	216M	0B	100%	
/packages/mnt/jkernel-9.6-20090519.0					
/dev/md2	66M	66M	0B	100%	
/packages/mnt/jpfe-T-9.6-20090519.0					
/dev/md3	4.1M	4.1M	0B	100%	
/packages/mnt/jdocs-9.6-20090519.0					
/dev/md4	57M	57M	0B	100%	
/packages/mnt/jroute-9.6-20090519.0					
/dev/md5	15M	15M	0B	100%	
/packages/mnt/jcrypto-9.6-20090519.0					
/dev/md6	34M	34M	0B	100%	
/packages/mnt/jpfe-common-9.6-20090519.0					
/dev/md7	2.0G	10.0K	1.8G	0%	/tmp
/dev/md8	2.0G	540K	1.8G	0%	/mfs
/dev/ad0s1e	383M	88K	352M	0%	/config
procfs	4.0K	4.0K	0B	100%	/proc
/dev/ad1s1f	23G	13G	7.7G	64%	/var

lcc2-re0:

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/ad0s1a	3.4G	178M	2.9G	6%	/
devfs	1.0K	1.0K	0B	100%	/dev
devfs	1.0K	1.0K	0B	100%	/dev/
/dev/md0	33M	33M	0B	100%	/packages/mnt/jbase
/dev/md1	216M	216M	0B	100%	
/packages/mnt/jkernel-9.6-20090519.0					
/dev/md2	66M	66M	0B	100%	
/packages/mnt/jpfe-T-9.6-20090519.0					
/dev/md3	4.1M	4.1M	0B	100%	
/packages/mnt/jdocs-9.6-20090519.0					
/dev/md4	57M	57M	0B	100%	
/packages/mnt/jroute-9.6-20090519.0					
/dev/md5	15M	15M	0B	100%	
/packages/mnt/jcrypto-9.6-20090519.0					
/dev/md6	34M	34M	0B	100%	
/packages/mnt/jpfe-common-9.6-20090519.0					
/dev/md7	2.0G	10.0K	1.8G	0%	/tmp
/dev/md8	2.0G	540K	1.8G	0%	/mfs
/dev/ad0s1e	383M	64K	352M	0%	/config
procfs	4.0K	4.0K	0B	100%	/proc
/dev/ad1s1f	23G	3.7G	17G	18%	/var

lcc3-re0:

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/ad0s1a	3.4G	178M	2.9G	6%	/
devfs	1.0K	1.0K	0B	100%	/dev
devfs	1.0K	1.0K	0B	100%	/dev/

/dev/md0	33M	33M	0B	100%	/packages/mnt/jbase
/dev/md1	216M	216M	0B	100%	
/packages/mnt/jkernel-9.6-20090519.0					
/dev/md2	66M	66M	0B	100%	
/packages/mnt/jpfe-T-9.6-20090519.0					
/dev/md3	4.1M	4.1M	0B	100%	
/packages/mnt/jdocs-9.6-20090519.0					
/dev/md4	57M	57M	0B	100%	
/packages/mnt/jroute-9.6-20090519.0					
/dev/md5	15M	15M	0B	100%	
/packages/mnt/jcrypto-9.6-20090519.0					
/dev/md6	34M	34M	0B	100%	
/packages/mnt/jpfe-common-9.6-20090519.0					
/dev/md7	2.0G	10.0K	1.8G	0%	/tmp
/dev/md8	2.0G	540K	1.8G	0%	/mfs
/dev/ad0s1e	383M	34K	352M	0%	/config
procfs	4.0K	4.0K	0B	100%	/proc
/dev/ad1s1f	23G	18G	3.5G	84%	/var

show system storage (QFX3500 Switch)

```
user@switch> show system storage
```

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/da0s2a	343M	192M	123M	61%	/
devfs	1.0K	1.0K	0B	100%	/dev
/dev/md0	119M	119M	0B	100%	/packages/mnt/jbase
/dev/md1	513M	513M	0B	100%	
/packages/mnt/jkernel-qfx-11.1R1.5					
/dev/md2	37M	37M	0B	100%	
/packages/mnt/jpfe-qfx-e9xxx-11.1R1.5					
/dev/md3	6.0M	6.0M	0B	100%	
/packages/mnt/jdocs-qfx-11.1R1.5					
/dev/md4	216M	216M	0B	100%	
/packages/mnt/jroute-qfx-11.1R1.5					
/dev/md5	59M	59M	0B	100%	
/packages/mnt/jcrypto-qfx-11.1R1.5					
/dev/md6	85M	85M	0B	100%	
/packages/mnt/jswitch-qfx-11.1R1.5					
/dev/md7	63M	8.0K	58M	0%	/tmp
/dev/da0s2f	228M	14M	196M	7%	/var
/dev/da0s3d	590M	3.0M	540M	1%	/var/tmp
/dev/da0s3e	104M	162K	95M	0%	/config
procfs	4.0K	4.0K	0B	100%	/proc

show system storage invoke-on all-routing-engines

```
user@host> show system storage invoke-on all-routing-engines
re0:
```

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/ad0s1a	3.3G	440M	2.6G	14%	/
devfs	1.0K	1.0K	0B	100%	/dev
/dev/md0	76M	76M	0B	100%	/packages/mnt/jbase
/dev/md1	40M	40M	0B	100%	
/packages/mnt/jkernel64-14.1-20140407.1					
/dev/md2	219M	219M	0B	100%	
/packages/mnt/jpfe-T-14.1-20140407.1					
/dev/md3	5.4M	5.4M	0B	100%	
/packages/mnt/jdocs-14.1-20140407.1					
/dev/md4	116M	116M	0B	100%	

```

/packages/mnt/jroute-14.1-20140407.1
/dev/md5          44M          44M          0B          100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6          70M          70M          0B          100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7          182K         182K          0B          100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8          499M         499M          0B          100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9          41M          41M          0B          100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10         12M          12M          0B          100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11         3.2G          8.0K          2.9G          0% /tmp
/dev/md12         3.2G          1.1M          2.9G          0% /mfs
/dev/ad0s1e       376M          220K          346M          0% /config
procfs           4.0K          4.0K          0B          100% /proc
/dev/ad1s1f       50G           43G          3.2G          93% /var

```

rel:

```

-----
Filesystem      Size      Used      Avail  Capacity  Mounted on
/dev/ad0s1a     3.3G      440M      2.6G      14%      /
devfs           1.0K      1.0K      0B        100%     /dev
/dev/md0        76M       76M       0B        100%     /packages/mnt/jbase
/dev/md1        40M       40M       0B        100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2        219M      219M      0B        100%
/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3        5.4M      5.4M      0B        100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4        116M      116M      0B        100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5        44M       44M      0B        100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6        70M       70M      0B        100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7        182K      182K      0B        100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8        499M      499M      0B        100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9        41M       41M      0B        100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10       12M       12M      0B        100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11       3.2G      8.0K      2.9G          0% /tmp
/dev/md12       3.2G      662K      2.9G          0% /mfs
/dev/ad0s1e     375M      230K      344M          0% /config
procfs         4.0K      4.0K      0B        100% /proc
/dev/ad1s1f     52G       46G      2.2G          95% /var

```

show system storage invoke-on other-routing-engine

```
user@host> show system storage invoke-on other-routing-engine
```

rel:

```

-----
Filesystem      Size      Used      Avail  Capacity  Mounted on
/dev/ad0s1a     3.3G      440M      2.6G      14%      /
devfs           1.0K      1.0K      0B        100%     /dev
/dev/md0        76M       76M       0B        100%     /packages/mnt/jbase
/dev/md1        40M       40M       0B        100%

```

/packages/mnt/jkernel64-14.1-20140407.1					
/dev/md2	219M	219M	0B	100%	
/packages/mnt/jpfe-T-14.1-20140407.1					
/dev/md3	5.4M	5.4M	0B	100%	
/packages/mnt/jdocs-14.1-20140407.1					
/dev/md4	116M	116M	0B	100%	
/packages/mnt/jroute-14.1-20140407.1					
/dev/md5	44M	44M	0B	100%	
/packages/mnt/jcrypto64-14.1-20140407.1					
/dev/md6	70M	70M	0B	100%	
/packages/mnt/jpfe-common-14.1-20140407.1					
/dev/md7	182K	182K	0B	100%	
/packages/mnt/jplatform-14.1-20140407.1					
/dev/md8	499M	499M	0B	100%	
/packages/mnt/jruntime-14.1-20140407.1					
/dev/md9	41M	41M	0B	100%	
/packages/mnt/jruntime64-14.1-20140407.1					
/dev/md10	12M	12M	0B	100%	
/packages/mnt/py-base-i386-14.1-20140407.1					
/dev/md11	3.2G	8.0K	2.9G	0%	/tmp
/dev/md12	3.2G	662K	2.9G	0%	/mfs
/dev/ad0s1e	375M	230K	344M	0%	/config
procfs	4.0K	4.0K	0B	100%	/proc
/dev/ad1s1f	52G	46G	2.2G	95%	/var

show system switchover

List of Syntax	Syntax on page 316
	Syntax (TX Matrix Router) on page 316
	Syntax (TX Matrix Plus Router) on page 316
	Syntax (MX Series Router) on page 316
Syntax	show system switchover
Syntax (TX Matrix Router)	show system switchover <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	show system switchover <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	show system switchover <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 13.2X51-D20 for QFX Series switches.
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 *only* on the backup Routing Engine. This command is *not* supported on the master Routing Engine because the kernel-replication process daemon does not run on the master Routing Engine. This process runs only on the backup Routing Engine.

Beginning Junos OS Release 9.6, the **show system switchover** command has been deprecated on the master Routing Engine on all routers other than a TX Matrix (switch-card chassis) or a TX Matrix Plus (switch-fabric chassis) router.

However, in a routing matrix, if you issue the **show system switchover** command on the master Routing Engine of the TX Matrix router (or switch-card chassis), the CLI displays graceful switchover information for the master Routing Engine of the T640 routers (or line-card chassis) in the routing matrix. Likewise, if you issue the **show system switchover** command on the master Routing Engine of a TX Matrix Plus router (or switch-fabric chassis), the CLI displays output for the master Routing Engine of T1600 or T4000 routers in the routing matrix.

Options **all-chassis**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display graceful Routing Engine switchover information for all Routing Engines on the TX Matrix router and the T640 routers configured in the routing matrix. On a TX Matrix Plus router, display graceful Routing Engine switchover information for all Routing Engines on the TX Matrix Plus router and the T1600 or T4000 routers configured in the routing matrix.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display graceful Routing Engine switchover information for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display graceful Routing Engine switchover information for all connected T1600 or T4000 LCCs.

Note that in this instance, packets get dropped. The LCCs perform GRES on their own chassis (GRES cannot be handled by one particular chassis for the entire router) and synchronization is not possible as the LCC plane bringup time varies for each LCC. Therefore, when there is traffic on these planes, there may be a traffic drop.

all-members—(MX Series routers only) (Optional) Display graceful Routing Engine switchover information for all Routing Engines on all members of the Virtual Chassis configuration.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display graceful Routing Engine switchover information for a specific T640 router connected to the TX Matrix router. On a TX Matrix Plus router, display graceful Routing Engine switchover information for a specific router connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display graceful Routing Engines switchover information for all Routing Engines on the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display graceful Routing Engine switchover information for all Routing Engines on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

scc—(TX Matrix router only) (Optional) Display graceful Routing Engine switchover information for the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display graceful Routing Engine switchover information for the TX Matrix Plus router.

Additional Information If you issue the **show system switchover** command on a TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.

Likewise, if you issue the **show system switchover** command on a TX Matrix Plus backup Routing Engine, the command is broadcast to all the T1600 or T4000 backup Routing Engines that are connected to it.

If you issue the **show system switchover** command on the active Routing Engine in the master router of an MX Series Virtual Chassis, the router displays a message that this command is not applicable on this member of the Virtual Chassis.

Required Privilege Level view

Related Documentation

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show system switchover \(Backup Routing Engine - Ready\) on page 319](#)
[show system switchover \(Backup Routing Engine - Not Ready\) on page 320](#)
[show system switchover \(MX Virtual Chassis\) on page 320](#)
[show system switchover \(MX Virtual Chassis\) on page 320](#)
[show system switchover \(Routing Matrix and Routing Matrix Plus\) - Master Ready on page 320](#)
[show system switchover \(Routing Matrix and Routing Matrix Plus\) - Master Not Ready on page 321](#)
[show system switchover \(Routing Matrix and Routing Matrix Plus\) - Backup Ready on page 321](#)
[show system switchover \(Routing Matrix and Routing Matrix Plus\) - Backup Not Ready on page 321](#)
[show system switchover all-lcc \(Routing Matrix and Routing Matrix Plus\) on page 322](#)

Output Fields [Table 11 on page 318](#) describes the output fields for the **show system switchover** command. Output fields are listed in the approximate order in which they appear.

Table 11: 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 graceful-switchover is specified for the routing-options configuration command. • Off—Indicates graceful-switchover is not specified for the routing-options configuration command.

Table 11: show system switchover Output Fields (continued)

Field Name	Field Description
Configuration database	<p>State of the configuration database:</p> <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	<p>State of the kernel database:</p> <ul style="list-style-type: none"> • Ready—Kernel database has synchronized. This message implies that the system is ready for GRES. • 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 Steady State for possible causes, or notify Juniper Networks customer support.
Peer state	<p>Routing Engine peer state:</p> <p>This field is displayed only when ksyncd is running in multichassis mode (LCC master).</p> <ul style="list-style-type: none"> • Steady State—Peer completed switchover transition. • Peer Connected—Peer in switchover transition.
Switchover Status	<p>Switchover Status:</p> <ul style="list-style-type: none"> • Ready—Message for system being switchover ready. • Not Ready—Message for system not being ready for switchover.

Sample Output

show system switchover (Backup Routing Engine - Ready)

```
user@host> show system switchover
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Ready
```

Switchover Status: Ready is the way the last line of the output reads if you are running Junos OS Release 16.1R1 or later. If you are running Junos OS Release 15.x, the last line of the output reads as Switchover Ready, for example:

```
user@host> show system switchover
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Ready
```

show system switchover (Backup Routing Engine - Not Ready)

```
user@host> show system switchover
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Not Ready
```

Switchover Status: Not Ready is the way the last line of the output reads if you are running Junos OS Release 16.1R1 or later. If you are running Junos OS Release 15.x, the last line of the output reads as Not ready for mastership switch, try after xxx secs, for example:

```
user@host> show system switchover
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Not ready for mastership switch, try after xxx secs.
```

show system switchover (MX Virtual Chassis)

```
{master:member1-re1}
user@host> show system switchover
member0:
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Ready

member1:
-----
Command is not applicable on this member of the virtual-chassis
```

show system switchover (MX Virtual Chassis)

```
{master:member1-re1}
user@host> show system switchover
member0:
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Ready

member1:
-----
Command is not applicable on this member of the virtual-chassis
```

show system switchover (Routing Matrix and Routing Matrix Plus) - Master Ready

```
user@host> show system switchover
lcc0-re1:
-----
Multichassis replication: On
Configuration database: Ready
```



```
Kernel database: Ready
Peer state: Steady State
Switchover Status: Ready
```

```
lcc2-re0:
```

```
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Ready
```

show system switchover (Routing Matrix and Routing Matrix Plus) - Master Not Ready

```
user@host> show system switchover
lcc0-re1:
```

```
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Ready
```

```
lcc2-re1:
```

```
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Not Ready
```

show system switchover (Routing Matrix and Routing Matrix Plus) - Backup Ready

```
user@host> show system switchover
scc-re0:
```

```
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Ready
```

```
lcc0-re0:
```

```
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Ready
```

```
lcc2-re1:
```

```
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Ready
```

show system switchover (Routing Matrix and Routing Matrix Plus) - Backup Not Ready

```
user@host> show system switchover
scc-re0:
```

```
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Not Ready
```

```
lcc0-re0:
```

```
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Ready
```

```
lcc2-re1:
```

```
-----
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Switchover Status: Ready
```

show system switchover all-lcc (Routing Matrix and Routing Matrix Plus)

```
user@host> show system switchover all-lcc
```

```
lcc0-re0:
```

```
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Ready
```

```
lcc2-re0:
```

```
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
Switchover Status: Ready
```

show system uptime

List of Syntax	Syntax on page 323 Syntax (EX Series Switches) on page 323 Syntax (QFX Series) on page 323 Syntax (TX Matrix Router) on page 323 Syntax (TX Matrix Plus Router) on page 323 Syntax (MX Series Router) on page 323
Syntax	show system uptime
Syntax (EX Series Switches)	show system uptime <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show system uptime <director-group <i>name</i> > <infrastructure <i>name</i> > <interconnect-device <i>name</i> > <node-group <i>name</i> >
Syntax (TX Matrix Router)	show system uptime <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	show system uptime <detail> <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	show system uptime <all-members> <invoke-on> <local> <member <i>member-id</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display the current time and information about how long the router or switch, router or switch software, and routing protocols have been running.



NOTE: Time values computed from differences in timestamps can vary due to the insertion or deletion of leap-seconds between them.

Options **none**—Show time since the system rebooted and processes started.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show time since the system rebooted and processes started on all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show time since the system rebooted and processes started for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, show time since the system rebooted and processes started for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on all members of the Virtual Chassis configuration.

director-group *name*—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Director group.

infrastructure *name*—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the fabric control Routing Engine and fabric manager Routing Engine.

interconnect-device *name*—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Interconnect device.

invoke-on—(MX Series routers only) (Optional) Display the time since the system rebooted and processes started on the master Routing Engine, backup Routing Engine, or both, on a router with two Routing Engines.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show time since the system rebooted and processes started for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, show time since the system rebooted and processes started for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

node-group *name*—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Node group.

scc—(TX Matrix routers only) (Optional) Show time since the system rebooted and processes started for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Show time since the system rebooted and processes started for the TX Matrix Plus router. Replace *number* with 0.

Additional Information By default, when you issue the **show system uptime** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level view

Related Documentation

- [10-Gigabit Ethernet LAN/WAN PIC with XFP \(T640 Router\)](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

- [show system uptime on page 326](#)
- [show system uptime all-lcc \(TX Matrix Router\) on page 326](#)
- [show system uptime all-lcc \(TX Matrix Plus Router\) on page 326](#)
- [show system uptime \(EX Series\) on page 327](#)
- [show system uptime \(QFX Series\) on page 327](#)

Output Fields [Table 12 on page 325](#) describes the output fields for the **show system uptime** command. Output fields are listed in the approximate order in which they appear.

Table 12: show system uptime Output Fields

Field Name	Field Description
Current time	Current system time in UTC.
Time Source	Reference time source that the system is locked to.
System booted	Date and time when the Routing Engine on the router or switch was last booted and how long it has been running.

Table 12: show system uptime Output Fields (continued)

Field Name	Field Description
Protocols started	Date and time when the routing protocols were last started and how long they have been running.
Last configured	Date and time when a configuration was last committed. Also shows the name of the user who issued the last commit command.
time and up	Current time, in the local time zone, and how long the router or switch has been operational.
users	Number of users logged in to the router or switch.
load averages	Load averages for the last 1 minute, 5 minutes, and 15 minutes.

Sample Output

show system uptime

```

user@host> show system uptime
Current time:      1998-10-13 19:45:47 UTC
Time Source:      NTP CLOCK
System booted:    1998-10-12 20:51:41 UTC (22:54:06 ago)
Protocols started: 1998-10-13 19:33:45 UTC (00:12:02 ago)
Last configured:  1998-10-13 19:33:45 UTC (00:12:02 ago) by abc
12:45PM up 22:54, 2 users, load averages: 0.07, 0.02, 0.01

```

show system uptime all-lcc (TX Matrix Router)

```

user@host> show system uptime all-lcc
lcc0-re0:
-----
Current time: 2004-09-13 09:55:35 PDT
Time Source: LOCAL CLOCK
System booted: 2004-09-13 03:13:55 PDT (06:41:40 ago)
Last configured: 2004-09-13 03:17:48 PDT (06:37:47 ago) by root
9:55AM PDT up 6:42, 1 user, load averages: 0.02, 0.03, 0.00
lcc2-re0:
-----
Current time: 2004-09-13 09:55:35 PDT
Time Source: LOCAL CLOCK
System booted: 2004-09-12 03:23:43 PDT (1d 06:31 ago)
Last configured: 2004-09-13 03:05:36 PDT (06:49:59 ago) by root
9:55AM PDT up 1 day, 6:32, 1 user, load averages: 0.02, 0.01, 0.00

```

show system uptime all-lcc (TX Matrix Plus Router)

```

user@host> show system uptime all-lcc
sfc0-re0:
-----
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:33 PDT (17:44:57 ago)
Protocols started: 2009-05-24 06:40:30 PDT (17:44:00 ago)
Last configured: 2009-05-24 06:33:27 PDT (17:51:03 ago) by user1
12:24AM up 17:45, 2 users, load averages: 0.07, 0.05, 0.01

```

lcc0-re0:

```
-----
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:46 PDT (17:44:44 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:47 PDT (17:43:43 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

lcc1-re0:

```
-----
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:38 PDT (17:44:52 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:18 PDT (17:44:12 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

lcc2-re0:

```
-----
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:48 PDT (17:44:42 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:44 PDT (17:43:46 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

lcc3-re0:

```
-----
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:44 PDT (17:44:46 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:08 PDT (17:44:22 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

show system uptime (EX Series)

```
user@switch> show system uptime
Current time: 2014-03-12 16:39:56 UTC
Time Source: NTP CLOCK
System booted: 2014-03-12 14:58:05 UTC (01:41:51 ago)
Protocols started: 2014-03-12 14:59:48 UTC (01:40:08 ago)
Last configured: 2014-03-12 14:58:58 UTC (01:40:58 ago) by root
4:39PM up 1:42, 4 users, load averages: 0.02, 0.02, 0.00
```

show system uptime (QFX Series)

```
user@switch> show system uptime
Current time: 2010-08-27 03:12:30 PDT
Time Source: NTP CLOCK
System booted: 2010-08-13 17:11:54 PDT (1w6d 10:00 ago)
Protocols started: 2010-08-13 17:13:56 PDT (1w6d 09:58 ago)
Last configured: 2010-08-26 05:54:00 PDT (21:18:30 ago) by user
3:12AM up 13 days, 10:01, 3 users, load averages: 0.00, 0.00, 0.00
```

show system virtual-memory

List of Syntax	Syntax on page 328 Syntax (EX Series) on page 328 Syntax (TX Matrix Router) on page 328 Syntax (TX Matrix Plus Router) on page 328 Syntax (MX Series Router) on page 328 Syntax (QFX Series) on page 328 Syntax (SRX Series) on page 328
Syntax	show system virtual-memory
Syntax (EX Series)	show system virtual-memory <all-members> <local> <member <i>member-id</i> >
Syntax (TX Matrix Router)	show system virtual-memory <all-chassis all-lcc lcc <i>number</i> scc>
Syntax (TX Matrix Plus Router)	show system virtual-memory <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i> >
Syntax (MX Series Router)	show system virtual-memory <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show system virtual-memory <infrastructure <i>name</i> > <interconnect-device <i>name</i> > <node-group <i>name</i> >
Syntax (SRX Series)	show system virtual-memory
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display the usage of Junos OS kernel memory listed first by size of allocation and then by type of usage. Use the show system virtual-memory command for troubleshooting with Juniper Networks Customer Support.
Options	none —Display kernel dynamic memory usage information.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for all chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display kernel dynamic memory usage information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display kernel dynamic memory usage information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for all members of the Virtual Chassis configuration.

infrastructure *name*—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the fabric control Routing Engine and fabric manager Routing Engine.

interconnect-device *name*—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Interconnect device.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display kernel dynamic memory usage information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display kernel dynamic memory usage information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

node-group *name*—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Node group.

scc—(TX Matrix routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix Plus router. Replace ***number*** with 0.

Additional Information By default, when you issue the **show system virtual-memory** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.



NOTE: The **show system virtual-memory** command with the **| display XML** pipe option now displays XML output for the command in the parent tags: **<vmstat-memstat-malloc>**, **<vmstat-memstat-zone>**, **<vmstat-sumstat>**, **<vmstat-intr>**, and **<vmstat-kernel-state>** with each child element as a separate XML tag. In Junos OS Releases 10.1 and earlier, the **| display XML** option for this command does not have an XML API element and the entire output is displayed in a single **<output>** tag element.

Required Privilege Level view

Related Documentation

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output [show system virtual-memory on page 332](#)
[show system virtual-memory scc \(TX Matrix Router\) on page 336](#)
[show system virtual-memory sfc \(TX Matrix Plus Router\) on page 337](#)
[show system virtual-memory | display xml on page 340](#)
[show system virtual-memory \(QFX Series\) on page 363](#)

Output Fields [Table 13 on page 331](#) lists the output fields for the **show system virtual-memory** command. Output fields are listed in the approximate order in which they appear.

Table 13: show system virtual-memory Output Fields

Field Name	Field Description
Memory statistics by bucket size	
Size	Memory block size (bytes). The kernel memory allocator appropriates blocks of memory whose size is exactly a power of 2.
In Use	Number of memory blocks of this size that are in use (bytes).
Free	Number of memory blocks of this size that are free (bytes).
Requests	Number of memory allocation requests made.
HighWater	Maximum value the free list can have. Once the system starts reclaiming physical memory, it continues until the free list is increased to this value.
Couldfree	Total number of times that the free elements for a bucket size exceed the high-water mark for that bucket size.
Memory usage type by bucket size	
Size	Memory block size (bytes).
Type(s)	Kernel modules that are using these memory blocks. For a definition of each type, refer to a FreeBSD book.
Memory statistics by type	
Type	Kernel module that is using dynamic memory.
InUse	Number of memory blocks used by this type. The number is rounded up.
MemUse	Amount of memory in use, in kilobytes (KB).
HighUse	Maximum memory ever used by this type.
Limit	Maximum memory that can be allocated to this type.
Requests	Total number of dynamic memory allocation requests this type has made.
Type Limit	Number of times requests were blocked for reaching the maximum limit.
Kern Limit	Number of times requests were blocked for the kernel map.
Size(s)	Memory block sizes this type is using.
Memory Totals	
In Use	Total kernel dynamic memory in use (bytes, rounded up).
Free	Total kernel dynamic memory free (bytes, rounded up).

Table 13: show system virtual-memory Output Fields (continued)

Field Name	Field Description
Requests	Total number of memory allocation requests.
ITEM	Kernel module that is using memory.
Size	Memory block size (bytes).
Limit	Maximum memory that can be allocated to this type.
Used	Number of memory blocks used by this type. The number is rounded up.
Free	Number of memory blocks available to this type.
Requests	Total number of memory allocation requests this type has made.
interrupt	Timer events and scheduling interruptions.
total	Total number of interruptions for each type.
rate	Interruption rate.
Total	Total for all interruptions.

Sample Output

show system virtual-memory

```

user@host> show system virtual-memory
Memory statistics by bucket size
Size  In Use  Free  Requests  HighWater  Couldfree
16      906    118    154876    1280        0
32      455    313    209956    640         0
64     4412    260    75380     320        20
128    3200     32    19361     160        81
256    1510     10    8844      80         4
512     446      2    5085      40         0
1K       18      2    5901      20         0
2K     1128      2    4445      10       1368
4K       185      1     456        5         0
8K        5      1    2653        5         0
16K      181      0     233        5         0
32K        2      0    1848        5         0
64K       20      0      22        5         0
128K       5      0       5        5         0
256K        2      0       2        5         0
512K        1      0       1        5         0

Memory usage type by bucket size
Size  Type(s)
16  uc_devlist, nexusdev, iftable, temp, devbuf, atexit, COS, BPF,
    DEVFS mount, DEVFS node, vnodes, mount, pcb, soname, proc-args, kld,
    MD disk, rman, ATA generic, bus, sysctl, ippool, pfestat, ifstate,

```

```

pfe_ipc, mkey, rtable, ifmaddr, ipfw, rnode
32 atkbddev, dirrem, mkdir, diradd, freefile, freefrag, indirdep,
bmsafemap, newblk, temp, devbuf, COS, vnodes, cluster_save buffer,
pcb, soname, proc-args, sigio, kld, Gzip trees, taskqueue, SWAP,
eventhandler, bus, sysctl, uidinfo, subproc, pgrp, pfestat, itable32,
ifstate, pfe_ipc, mkey, rtable, ifmaddr, ipfw, rnode, rtnexthop
64 isadev, iftable, MFS node, allocindir, allocdirect, pagedep, temp,
devbuf, lockf, COS, NULLFS hash, DEVFS name, vnodes,
cluster_save buffer, vfscache, pcb, soname, proc-args, file,
AR driver, AD driver, Gzip trees, rman, eventhandler, bus, sysctl,
subproc, pfestat, pic, ifstate, pfe_ipc, mkey, ifaddr, rtable, ipfw
128 ZONE, freeblks, inodedep, temp, devbuf, zombie, COS, DEVFS node,
vnodes, mount, vfscache, pcb, soname, proc-args, ttys, dev_t,
timecounter, kld, Gzip trees, ISOFS node, bus, uidinfo, cred,
session, pic, itable16, ifstate, pfe_ipc, rtable, ifstat, metrics,
rtnexthop, iffamily
256 iflogical, iftable, MFS node, FFS node, newblk, temp, devbuf,
NFS daemon, vnodes, proc-args, kqueue, file desc, Gzip trees, bus,
subproc, itable16, ifstate, pfe_ipc, sysctl, rtnexthop
512 UFS mount, temp, devbuf, mount, BIO buffer, ptys, ttys, AR driver,
Gzip trees, ISOFS mount, msg, iocltops, ATA generic, bus, proc,
pfestat, lr, ifstate, pfe_ipc, rtable, ipfw, ifstat, rtnexthop
1K iftable, temp, devbuf, NQ NFS Lease, kqueue, kld, AD driver,
Gzip trees, sem, MD disk, bus, ifstate, pfe_ipc, ipfw
2K uc_devlist, UFS mount, temp, devbuf, BIO buffer, pcb, AR driver,
Gzip trees, iocltops, bus, ipfw, ifstat, rcache
4K memdesc, iftable, UFS mount, temp, devbuf, kld, Gzip trees, sem, msg
8K temp, devbuf, syncache, Gzip trees
16K indirdep, temp, devbuf, shm, msg
32K pagedep, kld, Gzip trees
64K VM pgdata, devbuf, MSDOSFS mount
128K UFS ihash, inodedep, NFS hash, kld, ISOFS mount
256K mbuf, vfscache
512K SWAP

```

Memory statistics by type					Type	Kern		
Type	InUse	MemUse	HighUse	Limit	Requests	Limit	Limit	Size(s)
isadev	13	1K	1K127753K	13	0	0	0	64
atkbddev	2	1K	1K127753K	2	0	0	0	32
uc_devlist	24	3K	3K127753K	24	0	0	0	16,2K
nexusdev	3	1K	1K127753K	3	0	0	0	16
memdesc	1	4K	4K127753K	1	0	0	0	4K
mbuf	1	152K	152K127753K	1	0	0	0	256K
iflogical	6	2K	2K127753K	6	0	0	0	256
iftable	17	9K	9K127753K	18	0	0	0	16,64,256,1K,4K
ZONE	15	2K	2K127753K	15	0	0	0	128
VM pgdata	1	64K	64K127753K	1	0	0	0	64K
UFS mount	12	26K	26K127753K	12	0	0	0	512,2K,4K
UFS ihash	1	128K	128K127753K	1	0	0	0	128K
MFS node	6	2K	3K127753K	35	0	0	0	64,256
FFS node	906	227K	227K127753K	1352	0	0	0	256
dirrem	0	0K	4K127753K	500	0	0	0	32
mkdir	0	0K	1K127753K	38	0	0	0	32
diradd	0	0K	6K127753K	521	0	0	0	32
freefile	0	0K	4K127753K	374	0	0	0	32
freeblks	0	0K	8K127753K	219	0	0	0	128
freefrag	0	0K	1K127753K	193	0	0	0	32
allocindir	0	0K	25K127753K	1518	0	0	0	64
indirdep	0	0K	17K127753K	76	0	0	0	32,16K
allocdirect	0	0K	10K127753K	760	0	0	0	64
bmsafemap	0	0K	1K127753K	72	0	0	0	32

newblk	1	1K	1K127753K	2279	0	0	32,256
inodedep	1	128K	175K127753K	2367	0	0	128,128K
pagedep	1	32K	33K127753K	47	0	0	64,32K
temp	1239	92K	96K127753K	8364	0	0	16,32,64K
devbuf	1413	5527K	5527K127753K	1535	0	0	16,32,64,128,256
lockf	38	3K	3K127753K	2906	0	0	64
atexit	1	1K	1K127753K	1	0	0	16
zombie	0	0K	2K127753K	3850	0	0	128
NFS hash	1	128K	128K127753K	1	0	0	128K
NQNFS Lease	1	1K	1K127753K	1	0	0	1K
NFS daemon	1	1K	1K127753K	1	0	0	256
syncache	1	8K	8K127753K	1	0	0	8K
COS	353	44K	44K127753K	353	0	0	16,32,64,128
BPF	189	3K	3K127753K	189	0	0	16
MSDOSFS mount	1	64K	64K127753K	1	0	0	64K
NULLFS hash	1	1K	1K127753K	1	0	0	64
DEVFS mount	2	1K	1K127753K	2	0	0	16
DEVFS name	487	31K	31K127753K	487	0	0	64
DEVFS node	471	58K	58K127753K	479	0	0	16,128
vnodes	28	7K	7K127753K	429	0	0	16,32,64,128,256
mount	15	8K	8K127753K	18	0	0	16,128,512
cluster_save buffer	0	0K	1K127753K	55	0	0	32,64
vfscache	1898	376K	376K127753K	3228	0	0	64,128,256K
BIO buffer	49	98K	398K127753K	495	0	0	512,2K
pcb	159	16K	17K127753K	399	0	0	16,32,64,128,2K
soname	82	10K	10K127753K	42847	0	0	16,32,64,128
proc-args	57	2K	3K127753K	2105	0	0	16,32,64,128,256
ptys	32	16K	16K127753K	32	0	0	512
ttys	254	33K	33K127753K	522	0	0	128,512
kqueue	5	3K	4K127753K	23	0	0	256,1K
sigio	1	1K	1K127753K	27	0	0	32
file	383	24K	24K127753K	16060	0	0	64
file desc	76	19K	20K127753K	3968	0	0	256
shm	1	12K	12K127753K	1	0	0	16K
dev_t	286	36K	36K127753K	286	0	0	128
timecounter	10	2K	2K127753K	10	0	0	128
kld	11	117K	122K127753K	34	0	0	16,32,128,1K,4K
AR driver	1	1K	3K127753K	5	0	0	64,512,2K
AD driver	2	2K	3K127753K	2755	0	0	64,1K
Gzip trees	0	0K	46K127753K	133848	0	0	32,64,128,256
ISOFS node	1136	142K	142K127753K	1189	0	0	128
ISOFS mount	9	132K	132K127753K	10	0	0	512,128K
sem	3	6K	6K127753K	3	0	0	1K,4K
MD disk	2	2K	2K127753K	2	0	0	16,1K
msg	4	25K	25K127753K	4	0	0	512,4K,16K
rman	59	4K	4K127753K	461	0	0	16,64
ioctlops	0	0K	2K127753K	992	0	0	512,2K
taskqueue	2	1K	1K127753K	2	0	0	32
SWAP	2	413K	413K127753K	2	0	0	32,512K
ATA generic	6	3K	3K127753K	6	0	0	16,512
eventhandler	17	1K	1K127753K	17	0	0	32,64
bus	340	30K	31K127753K	794	0	0	16,32,64,128,256
sysctl	0	0K	1K127753K	130262	0	0	16,32,64
uidinfo	4	1K	1K127753K	10	0	0	32,128
cred	22	3K	3K127753K	3450	0	0	128
subproc	156	10K	10K127753K	7882	0	0	32,64,256
proc	2	1K	1K127753K	2	0	0	512
session	12	2K	2K127753K	34	0	0	128
pgrp	16	1K	1K127753K	45	0	0	32
ippool	1	1K	1K127753K	1	0	0	16
pfestat	0	0K	1K127753K	47349	0	0	16,32,64,512

pic	5	1K	1K127753K	5	0	0	64,128
lr	1	1K	1K127753K	1	0	0	512
itable32	110	4K	4K127753K	110	0	0	32
itable16	161	26K	26K127753K	161	0	0	128,256
ifstate	694	159K	160K127753K	1735	0	0	16,32,64,128,1K
pfe_ipc	0	0K	1K127753K	56218	0	0	16,32,64,128,1K
mkey	250	4K	4K127753K	824	0	0	16,32,64
ifaddr	9	1K	1K127753K	9	0	0	64
sysctl	0	0K	1K127753K	30	0	0	256
rtable	49	6K	6K127753K	307	0	0	16,32,64,128,512
ifmaddr	22	1K	1K127753K	22	0	0	16,32
ipfw	23	10K	10K127753K	48	0	0	16,32,64,512,2K
ifstat	698	805K	805K127753K	698	0	0	128,512,2K
rcache	4	8K	8K127753K	4	0	0	2K
rnode	27	1K	1K127753K	285	0	0	16,32
metrics	1	1K	1K127753K	3	0	0	128
rtnexthop	57	9K	9K127753K	312	0	0	32,128,256,512
iffamily	12	2K	2K127753K	12	0	0	128

Memory Totals:	In Use	Free	Requests
	9311K	54K	489068

ITEM	SIZE	LIMIT	USED	FREE	REQUESTS
PIPE:	192,	0,	4,	81,	4422
SWAPMETA:	160,	95814,	0,	0,	0
unpcb:	160,	0,	114,	36,	279
ripcb:	192,	25330,	5,	37,	5
syncache:	128,	15359,	0,	64,	5
tcpcb:	576,	25330,	23,	12,	32
udpcb:	192,	25330,	14,	28,	255
socket:	256,	25330,	246,	26,	819
KNOTE:	96,	0,	27,	57,	71
NFSNODE:	352,	0,	0,	0,	0
NFSMOUNT:	544,	0,	0,	0,	0
VNODE:	224,	0,	2778,	43,	2778
NAMEI:	1024,	0,	0,	8,	40725
VMSPACE:	192,	0,	57,	71,	3906
PROC:	448,	0,	73,	17,	3923
DP fakepg:	64,	0,	0,	0,	0
PV ENTRY:	28,	499566,	44530,	152053,	1525141
MAP ENTRY:	48,	0,	1439,	134,	351075
KMAP ENTRY:	48,	35645,	179,	119,	10904
MAP:	108,	0,	7,	3,	7
VM OBJECT:	92,	0,	2575,	109,	66912

```

792644 cpu context switches
9863474 device interrupts
286510 software interrupts
390851 traps
3596829 system calls
  16 kernel threads created
 3880 fork() calls
   27 vfork() calls
    0 rfork() calls
    0 swap pager pageins
    0 swap pager pages paged in
    0 swap pager pageouts
    0 swap pager pages paged out
 380 vnode pager pageins
 395 vnode pager pages paged in
 122 vnode pager pageouts

```

```

1476 vnode pager pages paged out
    0 page daemon wakeups
    0 pages examined by the page daemon
101 pages reactivated
161722 copy-on-write faults
    0 copy-on-write optimized faults
84623 zero fill pages zeroed
83063 zero fill pages prezeroed
    7 intransit blocking page faults
535606 total VM faults taken
    0 pages affected by kernel thread creation
238254 pages affected by fork()
    2535 pages affected by vfork()
    0 pages affected by rfork()
283379 pages freed
    0 pages freed by daemon
190091 pages freed by exiting processes
17458 pages active
29166 pages inactive
    0 pages in VM cache
10395 pages wired down
134610 pages free
    4096 bytes per page
183419 total name lookups
    cache hits (90% pos + 7% neg) system 0% per-directory
    deletions 0%, falsehits 0%, toolong 0%

interrupt          total          rate
ata0 irq14         113338           3
mux irq7           727643          21
fxp1 irq10        1178671          34
sio0 irq4           833             0
clk irq0          3439769          99
rtc irq8          4403221         127
Total             9863475         286

Kernel direct memory map:
    4423 pages used
    4057340 pages maximum

```

Note: Kernel direct memory map only displays for 64 bit platform.

show system virtual-memory scc (TX Matrix Router)

```
user@host> show system virtual-memory scc
```

Memory statistics by bucket size

Size	In Use	Free	Requests	HighWater	Couldfree
16	898	126	749493	1280	0
32	2018	1310	980643	640	632
64	3490	13342	935420	320	5365
...					

Memory usage type by bucket size

Size	Type(s)
16	uc_devlist, COS, BPF, DEVFS mount, DEVFS node, vnodes, mount, pcb, soname, rman, bus, sysctl, ifstate, pfe_ipc, mkey, socket, rtable, ifmaddr, ipfw, rnode, iftable, temp, devbuf, atexit, proc-args, kld, MD disk
32	atkbddev, Gzip trees, dirrem, mkdir, diradd, freefile, freefrag, indirdep, bmsafemap, newblk, tseg_qent, COS, vnodes,

...

```

Memory statistics by type
      Type InUse MemUse HighUse Limit Requests Limit Limit Size(s)
      isadev 12 1K 1K166400K 12 0 0 64
      atkbddev 2 1K 1K166400K 2 0 0 32
      uc_devlist 24 3K 3K166400K 24 0 0 16,2K
      ....

Memory Totals: In Use Free Requests
                6091K 1554K 2897122

```

show system virtual-memory sfc (TX Matrix Plus Router)

```

user@host> show system virtual-memory sfc 0
sfc0-re0:

```

```

-----
      Type InUse MemUse HighUse Requests Size(s)
CAM dev queue 1 1K - 1 64
  entropy 1024 64K - 1024 64
  linker 487 6272K - 1163 16,32,64,4096,32768,131072
  USB 127 10K - 127 16,32,64,128,256,1024,2048
  lockf 46 3K - 98418 64
  USBdev 10 2K - 34 16,128,2048,16384
ifstateSLLNode 0 0K - 1096 16
  devbuf 21243 15683K - 21810
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
  temp 1283 151K - 2483472
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
  ip6ndp 0 0K - 4 64
  in6ifmulti 1 1K - 1 64
  in6grenty 1 1K - 1 64
  iflogical 20 5K - 29 2048
  iffamilly 45 6K - 69 32,1024,2048
  rtnexthop 266 46K - 608013 32,256,512,1024,2048,4096
  metrics 31 4K - 54 256
  rnode 212 4K - 607848 16,32
  rcache 4 8K - 4 65536
  iflist 0 0K - 6 16,64
  ifdevice 11 8K - 17 16,32768
  ifstat 424 472K - 427 512,16384,65536
  ipfw 42 23K - 145
16,32,64,128,256,512,1024,16384,32768,65536,131072
  ifmaddr 415 11K - 415 16,32
  rtable 329 28K - 608066 16,32,64,128,1024,16384
  sysctl 0 0K - 887976 16,32,64,4096,16384,32768
  ifaddr 64 5K - 70 32,64,128
  mkey 331 6K - 12528 16,128
  pfe_ipc 0 0K - 7299115
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
  ifstate 1245054 70088K - 3040437
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768
  idxbucket 1 1K - 1 16
  itable16 5069 1250K - 5103 1024,4096
  itable32 157 10K - 157 64
  itable64 2 1K - 2 128
  lr 1 1K - 4 16384
  pic 37 6K - 37 64,16384
  pfestat 0 0K - 6220 32,64,128,256,131072
  gencfg 1486 424K - 2614 16,32,64,256,512,16384,32768,65536

```

```

        jsr      2      1K      -      22  16
        idl      1      4K      -      165
32, 64, 128, 256, 512, 1024, 2048, 8192, 16384, 32768, 65536, 131072
        rtmsg    0      0K      -      16  131072
        module   250     16K      -      250  64, 128
        mtx_pool  1      8K      -      1   64, 128
        DEVFS3   113     13K      -      114  256
        DEVFS1   106     24K      -      106  2048
        pgrp     15      1K      -      8600 64
        session  11      2K      -      2829 512
        proc     2      1K      -      2   16384
        subproc  296     572K     -      24689 2048, 131072
        cred     38      5K      -      619244 256
        plimit   18      4K      -      21311 2048
        uidinfo   3      1K      -      10   32, 512
        sysctl0id 2701    82K      -      2701 16, 32, 64
        sysctltmp 0      0K      -      15572 16, 32, 64, 1024
        umtx     171     11K      -      171  64
        SWAP      2     277K      -      2   64
        bus      779    125K      -      3072 16, 32, 64, 128, 32768
        bus-sc    67     62K      -      1477
16, 32, 64, 512, 1024, 2048, 8192, 16384, 65536, 131072
        devstat   8     17K      -      8   16, 131072
        eventhandler 46     2K      -      47   32, 128
        kobj      93    186K      -      111  65536
        DEVFS      8      1K      -      9   16, 64
        rman     106     7K      -      490  16, 32, 64
        sbuf      0      0K      -      28234 16, 32, 32768, 131072
...
lcc0-re0:

```

```

-----
      Type InUse MemUse HighUse Requests Size(s)
CAM dev queue    1      1K      -      1   64
      entropy  1024     64K      -     1024  64
      linker   487    6272K      -     1163 16, 32, 64, 4096, 32768, 131072
      USB     127     10K      -      127 16, 32, 64, 128, 256, 1024, 2048
      lockf    23      2K      -    169585  64
      USBdev   10      2K      -       34 16, 128, 2048, 16384
      devbuf  5128   10760K      -     5310
16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072
      temp   1285     151K      -     10770
16, 32, 64, 128, 256, 512, 2048, 4096, 8192, 16384, 32768, 65536, 131072
      ip6ndp    0      0K      -        4   64
      iflogical 20      5K      -       29  2048
      iffamilly 45      6K      -       69 32, 1024, 2048
      rtnexthop 189     29K      -    1211988 32, 256, 512, 1024, 2048, 4096
      metrics   11      2K      -       16  256
      rnode    135      3K      -    606391 16, 32
      rcache     4      8K      -        4  65536
      iflist     0      0K      -        6  16, 64
      ifdevice  11      8K      -       17 16, 32768
      ifstat   412    471K      -      415 512, 16384, 65536
      ipfw      42     23K      -        91
16, 32, 64, 128, 256, 512, 1024, 16384, 32768, 65536, 131072
      ifmaddr   415     11K      -       415 16, 32
      rtable   225     20K      -    606584 16, 32, 64, 128, 1024, 16384
      sysctl     0      0K      -    2302479 16, 32, 64
      ifaddr    53      4K      -        69 32, 64, 128
      mkey     133      3K      -     8974 16, 128
      pfe_ipc    0      0K      -    19035108
16, 32, 64, 128, 512, 1024, 2048, 8192, 16384, 32768, 65536, 131072

```

```

ifstate 710270 42176K - 9583703
16,32,64,128,256,512,1024,2048,8192,16384,32768
idxbucket 1 1K - 1 16
itable16 5045 1245K - 1825178 1024,4096
itable32 157 10K - 157 64
itable64 2 1K - 2 128
lr 1 1K - 4 16384
pic 37 6K - 37 64,16384
pfestat 0 0K - 1682 32,64,128,256,131072
gencfg 1486 424K - 2812 16,32,64,256,512,16384,32768,65536
jsr 0 0K - 22 16
idl 0 0K - 4 32768,131072
rtsmsg 0 0K - 3 131072
module 250 16K - 250 64,128
mtx_pool 1 8K - 1 64,128
DEVFS3 108 12K - 109 256
DEVFS1 101 23K - 101 2048
pgrp 5 1K - 917 64
session 5 1K - 917 512
proc 2 1K - 2 16384
subproc 217 441K - 4867 2048,131072
cred 21 3K - 48719 256
plimit 9 2K - 5255 2048
uidinfo 2 1K - 2 32,512
sysctluid 2786 85K - 2786 16,32,64
sysctltmp 0 0K - 1833 16,32,64,1024
umtx 126 8K - 126 64
SWAP 2 277K - 2 64
bus 780 125K - 2734 16,32,64,128,32768
bus-sc 69 69K - 1194
16,32,64,512,1024,2048,8192,16384,65536,131072
devstat 8 17K - 8 16,131072
eventhandler 45 2K - 46 32,128
kobj 93 186K - 111 65536
DEVFS 8 1K - 9 16,64
rman 94 6K - 477 16,32,64
sbuf 0 0K - 532 16,32,32768,131072
NULLFS hash 1 1K - 1 64
taskqueue 5 1K - 5 64
turnstiles 127 8K - 127 64
Unitno 6 1K - 44 16,64
ioctlops 0 0K - 1771718 16,32,64,128,8192,16384,65536,131072

iov 0 0K - 79425 16,64,128,256,512,1024,2048,131072
msg 4 25K - 4 32768,131072
sem 4 7K - 4 16384,32768,131072
shm 2 13K - 4 32768
ttys 93 16K - 195 512,32768
soname 31 3K - 389284 16,32,64,256
pcb 101 16K - 4374
16,32,64,128,1024,2048,4096,16384,65536
BIO buffer 40 80K - 750 65536
vfscache 1 512K - 1 65536
cluster_save buffer 0 OK - 55 32,64
VFS hash 1 256K - 1 32,64
vnodes 1 1K - 1 512
mount 266 21K - 481 16,32,64,128,256,4096,32768
vnodemarker 0 0K - 2497 16384
pfs_nodes 25 3K - 25 128
pfs_vncache 144 5K - 386 32
STP 1 1K - 1 64

```

```

        GEOM      173      15K      -      1068
16,32,64,128,256,512,2048,16384,32768,131072
        syncache   1       8K      -       1
16,32,64,128,256,512,2048,16384,32768,131072
        tlv_stat   0       0K      -      223
16,32,64,128,256,512,2048,16384,32768,131072
        NFS daemon  1       8K      -       1
16,32,64,128,256,512,2048,16384,32768,131072
        p1003.1b   1       1K      -       1  16
        MD disk    9      18K      -       9 65536
        ata_generic 2       2K      -      25 16,16384,32768
        ISOFS mount 7       1K      -      13 512
        ISOFS node 1439    135K     -    1453 128
        CAM SIM     1       1K      -       1 64
        CAM XPT     6       1K      -       9 16,64,16384
        CAM periph  1       1K      -       1 128
        ad_driver   2       1K      -       2 256
        pagedep     1      64K      -     105 64
        inodedep    1     256K     -     552 256
        newblk      1       1K      -     327 64,4096
        bmsafemap   0       0K      -      19 64
        allocdirect 0       0K      -     326 128
        freefrag    0       0K      -      31 32
        freeblks    0       0K      -     103 2048
        freefile    0       0K      -     175 32
        diradd      0       0K      -     590 64
        mkdir       0       0K      -     166 32
        dirrem      0       0K      -     382 32
        savedino    0       0K      -     283 512
        UFS mount   15     36K      -      15 2048,65536,131072
        ata_dma     6       1K      -       6 256
        UMAHash     1       4K      -       5 4096,16384,32768,65536,131072
        cdev        26     3K      -      26 256
        file desc   111    25K      -    5199 16,1024,2048,16384
        VM pgdata   2     65K      -       2 64
        sigio       1       1K      -      27 32
        kenv        30     5K      -      33 16,32,64,131072
        atkbddev    2       1K      -       2 32
        kqueue      0       0K      -      88 1024,4096,32768
        proc-args   28     2K      -    3970 32,64,128,256,512,1024
        isadev      23     2K      -      23 64
        zombie      1       1K      -    4651 128
        ithread     92     7K      -      92 16,64,256
        legacydrv   3       1K      -       3 16
        memdesc     1       4K      -       1 131072
        nexusdev    2       1K      -       2 16
        CAM queue   3       1K      -       3 16
        KTRACE      100    10K      -     100 128
        kbdmux      5       9K      -       5 128,2048,65536,131072
ITEM      SIZE      LIMIT      USED      FREE  REQUESTS
UMA Kegs:  136,      0,      71,      1,      71
...
```

show system virtual-memory | display xml

```

user@host> show system virtual-memory | display xml
<rpc-reply xmlns:junos="http://xml.device1.example.com/junos/10.2R1/junos">
  <system-virtual-memory-information>
    <vmstat-memstat-malloc>
      <memstat-name>CAM dev queue</memstat-name>
      <inuse>1</inuse>
    
```

```

<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>entropy</memstat-name>
<inuse>1024</inuse>
<memuse>64</memuse>
<high-use>--</high-use>
<memstat-req>1024</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>linker</memstat-name>
<inuse>481</inuse>
<memuse>1871</memuse>
<high-use>--</high-use>
<memstat-req>1145</memstat-req>
<memstat-size>16,32,64,4096,32768,131072</memstat-size>
<memstat-name>lockf</memstat-name>
<inuse>56</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>5998</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>devbuf</memstat-name>
<inuse>2094</inuse>
<memuse>3877</memuse>
<high-use>--</high-use>
<memstat-req>2099</memstat-req>

<memstat-size>16,32,64,128,512,1024,4096,8192,16384,32768,65536,131072</memstat-size>

<memstat-name>temp</memstat-name>
<inuse>21</inuse>
<memuse>66</memuse>
<high-use>--</high-use>
<memstat-req>3127</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072</memstat-size>

<memstat-name>ip6ndp</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>in6ifmulti</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>in6grentry</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>iflogical</memstat-name>
<inuse>13</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>

```

```
<memstat-size>64,2048</memstat-size>
<memstat-name>iffamily</memstat-name>
<inuse>28</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>28</memstat-req>
<memstat-size>32,1024,2048</memstat-size>
<memstat-name>rtnexthop</memstat-name>
<inuse>127</inuse>
<memuse>18</memuse>
<high-use>--</high-use>
<memstat-req>129</memstat-req>
<memstat-size>32,256,512,1024,2048,4096</memstat-size>
<memstat-name>metrics</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>inifmulti</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>3</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>ingrentry</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>rnode</memstat-name>
<inuse>68</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>76</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rcache</memstat-name>
<inuse>4</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ifdevice</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>ifstat</memstat-name>
<inuse>40</inuse>
<memuse>22</memuse>
<high-use>--</high-use>
<memstat-req>40</memstat-req>
<memstat-size>512,16384,32768</memstat-size>
<memstat-name>ipfw</memstat-name>
<inuse>42</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>91</memstat-req>
```

```

<memstat-size>16,32,64,128,256,512,1024,16384,32768,65536,131072</memstat-size>
  <memstat-name>ifmaddr</memstat-name>
  <inuse>103</inuse>
  <memuse>3</memuse>
  <high-use>--</high-use>
  <memstat-req>103</memstat-req>
  <memstat-size>16,32</memstat-size>
  <memstat-name>rtable</memstat-name>
  <inuse>129</inuse>
  <memuse>14</memuse>
  <high-use>--</high-use>
  <memstat-req>139</memstat-req>
  <memstat-size>16,32,64,128,1024,16384</memstat-size>
  <memstat-name>sysctl</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>--</high-use>
  <memstat-req>14847</memstat-req>
  <memstat-size>16,32,64,4096,16384,32768</memstat-size>
  <memstat-name>ifaddr</memstat-name>
  <inuse>29</inuse>
  <memuse>3</memuse>
  <high-use>--</high-use>
  <memstat-req>29</memstat-req>
  <memstat-size>64,128</memstat-size>
  <memstat-name>mkey</memstat-name>
  <inuse>345</inuse>
  <memuse>6</memuse>
  <high-use>--</high-use>
  <memstat-req>2527</memstat-req>
  <memstat-size>16,128</memstat-size>
  <memstat-name>pfe_ipc</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>--</high-use>
  <memstat-req>1422</memstat-req>

<memstat-size>16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072</memstat-size>
  <memstat-name>ifstate</memstat-name>
  <inuse>594</inuse>
  <memuse>51</memuse>
  <high-use>--</high-use>
  <memstat-req>655</memstat-req>

<memstat-size>16,32,64,128,256,1024,2048,4096,16384,32768</memstat-size>
  <memstat-name>itable16</memstat-name>
  <inuse>276</inuse>
  <memuse>52</memuse>
  <high-use>--</high-use>
  <memstat-req>294</memstat-req>
  <memstat-size>1024,4096</memstat-size>
  <memstat-name>itable32</memstat-name>
  <inuse>160</inuse>
  <memuse>10</memuse>
  <high-use>--</high-use>
  <memstat-req>160</memstat-req>
  <memstat-size>64</memstat-size>
  <memstat-name>itable64</memstat-name>
  <inuse>2</inuse>
  <memuse>1</memuse>

```

```
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>lr</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>pic</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64,512</memstat-size>
<memstat-name>pfestat</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>162</memstat-req>
<memstat-size>16,32,128,256,16384</memstat-size>
<memstat-name>gencfg</memstat-name>
<inuse>224</inuse>
<memuse>56</memuse>
<high-use>--</high-use>
<memstat-req>540</memstat-req>
<memstat-size>16,32,64,256,512,32768,65536</memstat-size>
<memstat-name>jsr</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>idl</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>
<memstat-size>16,32,64,128,256,4096,16384,32768,131072</memstat-size>

<memstat-name>rtsmsg</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>module</memstat-name>
<inuse>249</inuse>
<memuse>16</memuse>
<high-use>--</high-use>
<memstat-req>249</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>mtx_pool</memstat-name>
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>DEVFS3</memstat-name>
<inuse>109</inuse>
<memuse>12</memuse>
```



```

<high-use>--</high-use>
<memstat-req>117</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>DEVFS1</memstat-name>
<inuse>102</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>109</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>pgrp</memstat-name>
<inuse>12</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>session</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>proc</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>subproc</memstat-name>
<inuse>244</inuse>
<memuse>496</memuse>
<high-use>--</high-use>
<memstat-req>1522</memstat-req>
<memstat-size>2048,131072</memstat-size>
<memstat-name>cred</memstat-name>
<inuse>30</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>11409</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>plimit</memstat-name>
<inuse>17</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>133</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>uidinfo</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>32,512</memstat-size>
<memstat-name>sysctlpid</memstat-name>
<inuse>1117</inuse>
<memuse>34</memuse>
<high-use>--</high-use>
<memstat-req>1117</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sysctltmp</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>

```

```
<memstat-req>743</memstat-req>
<memstat-size>16,32,64,1024</memstat-size>
<memstat-name>umtx</memstat-name>
<inuse>144</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>144</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>SWAP</memstat-name>
<inuse>2</inuse>
<memuse>209</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>bus</memstat-name>
<inuse>496</inuse>
<memuse>55</memuse>
<high-use>--</high-use>
<memstat-req>1196</memstat-req>
<memstat-size>16,32,64,128,32768</memstat-size>
<memstat-name>bus-sc</memstat-name>
<inuse>23</inuse>
<memuse>33</memuse>
<high-use>--</high-use>
<memstat-req>335</memstat-req>

<memstat-size>16,32,64,512,1024,2048,8192,16384,65536,131072</memstat-size>
<memstat-name>devstat</memstat-name>
<inuse>10</inuse>
<memuse>21</memuse>
<high-use>--</high-use>
<memstat-req>10</memstat-req>
<memstat-size>16,131072</memstat-size>
<memstat-name>eventhandler</memstat-name>
<inuse>35</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>36</memstat-req>
<memstat-size>32,128</memstat-size>
<memstat-name>kobj</memstat-name>
<inuse>93</inuse>
<memuse>186</memuse>
<high-use>--</high-use>
<memstat-req>111</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>DEVFS</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>rman</memstat-name>
<inuse>71</inuse>
<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>433</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sbuf</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
```

```

<memstat-req>522</memstat-req>
<memstat-size>16,32,32768,131072</memstat-size>
<memstat-name>NULLFS hash</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>taskqueue</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>turnstiles</memstat-name>
<inuse>145</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>145</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>Unitno</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>44</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>iocltops</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>27622</memstat-req>
<memstat-size>16,64,8192,16384,131072</memstat-size>
<memstat-name>iov</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>18578</memstat-req>
<memstat-size>16,64,128,256,512,1024,2048,131072</memstat-size>
<memstat-name>msg</memstat-name>
<inuse>4</inuse>
<memuse>25</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32768,131072</memstat-size>
<memstat-name>sem</memstat-name>
<inuse>4</inuse>
<memuse>7</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16384,32768,131072</memstat-size>
<memstat-name>shm</memstat-name>
<inuse>9</inuse>
<memuse>20</memuse>
<high-use>--</high-use>
<memstat-req>14</memstat-req>
<memstat-size>32768</memstat-size>
<memstat-name>ttys</memstat-name>
<inuse>321</inuse>
<memuse>61</memuse>
<high-use>--</high-use>
<memstat-req>528</memstat-req>

```

```
<memstat-size>512,32768</memstat-size>
<memstat-name>ptys</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>mbuf_tag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>23383</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>soname</memstat-name>
<inuse>115</inuse>
<memuse>12</memuse>
<high-use>--</high-use>
<memstat-req>24712</memstat-req>
<memstat-size>16,32,64,256</memstat-size>
<memstat-name>pcb</memstat-name>
<inuse>216</inuse>
<memuse>33</memuse>
<high-use>--</high-use>
<memstat-req>484</memstat-req>

<memstat-size>16,32,64,128,1024,2048,4096,16384,32768,65536</memstat-size>
<memstat-name>BIO buffer</memstat-name>
<inuse>43</inuse>
<memuse>86</memuse>
<high-use>--</high-use>
<memstat-req>405</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>vfscache</memstat-name>
<inuse>1</inuse>
<memuse>256</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>cluster_save buffer</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32,64</memstat-size>
<memstat-name>VFS hash</memstat-name>
<inuse>1</inuse>
<memuse>128</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32,64</memstat-size>
<memstat-name>vnodes</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>mount</memstat-name>
<inuse>290</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>535</memstat-req>
```

```

<memstat-size>16,32,64,128,256,4096,32768</memstat-size>
<memstat-name>vnodemarker</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>498</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>pfs_nodes</memstat-name>
<inuse>25</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>25</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>pfs_vncache</memstat-name>
<inuse>27</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>53</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>STP</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>GEOM</memstat-name>
<inuse>146</inuse>
<memuse>11</memuse>
<high-use>--</high-use>
<memstat-req>1042</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>syncache</memstat-name>
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>tlv_stat</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>8</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>NFS_daemon</memstat-name>
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>p1003.1b</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>MD_disk</memstat-name>
<inuse>10</inuse>

```

```
<memuse>20</memuse>
<high-use>--</high-use>
<memstat-req>10</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ata_generic</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>16,16384,32768</memstat-size>
<memstat-name>ISOFs mount</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>ISOFs node</memstat-name>
<inuse>1440</inuse>
<memuse>135</memuse>
<high-use>--</high-use>
<memstat-req>1457</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>CAM SIM</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>CAM XPT</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64,16384</memstat-size>
<memstat-name>CAM periph</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ad_driver</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>pagedep</memstat-name>
<inuse>1</inuse>
<memuse>32</memuse>
<high-use>--</high-use>
<memstat-req>106</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>inodedep</memstat-name>
<inuse>1</inuse>
<memuse>128</memuse>
<high-use>--</high-use>
<memstat-req>464</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>newblk</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
```

```

<high-use>--</high-use>
<memstat-req>336</memstat-req>
<memstat-size>64,4096</memstat-size>
<memstat-name>bmsafemap</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>63</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>allocdirect</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>320</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>indirdep</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>17</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>allocindir</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>freefrag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>12</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>freeblks</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>40</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>freefile</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>101</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>diradd</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>465</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>mkdir</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>136</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>dirrem</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>

```

```
<memstat-req>168</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>newdirblk</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>savedino</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>157</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>UFS mount</memstat-name>
<inuse>15</inuse>
<memuse>36</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>2048,65536,131072</memstat-size>
<memstat-name>ata_dma</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>UMAHash</memstat-name>
<inuse>1</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>4096,16384,32768,65536</memstat-size>
<memstat-name>cdev</memstat-name>
<inuse>22</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>22</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>file desc</memstat-name>
<inuse>141</inuse>
<memuse>32</memuse>
<high-use>--</high-use>
<memstat-req>1583</memstat-req>
<memstat-size>16,1024,2048,16384</memstat-size>
<memstat-name>VM pgdata</memstat-name>
<inuse>2</inuse>
<memuse>65</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>sigio</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>20</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kenv</memstat-name>
<inuse>24</inuse>
<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>27</memstat-req>
```



```

<memstat-size>16,32,64,131072</memstat-size>
<memstat-name>atkbddev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kqueue</memstat-name>
<inuse>15</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>19</memstat-req>
<memstat-size>1024,4096,32768</memstat-size>
<memstat-name>proc-args</memstat-name>
<inuse>57</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>1001</memstat-req>
<memstat-size>16,32,64,128,256,512,1024</memstat-size>
<memstat-name>isadev</memstat-name>
<inuse>21</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>zombie</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>1278</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ithread</memstat-name>
<inuse>69</inuse>
<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>69</memstat-req>
<memstat-size>16,64,256</memstat-size>
<memstat-name>legacydrv</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>memdesc</memstat-name>
<inuse>1</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>nexusdev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>CAM queue</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>3</memstat-req>
<memstat-size>16</memstat-size>

```

```
<memstat-name>$PIR</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>KTRACE</memstat-name>
<inuse>100</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>100</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>kbdmux</memstat-name>
<inuse>5</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>128,2048,65536,131072</memstat-size>
</vmstat-memstat-malloc>
<vmstat-memstat-zone>
  <zone-name>UMA Kegs:</zone-name>
  <zone-size>136</zone-size>
  <count-limit>0</count-limit>
  <used>71</used>
  <free>1</free>
  <zone-req>71</zone-req>
  <zone-name>UMA Zones:</zone-name>
  <zone-size>120</zone-size>
  <count-limit>0</count-limit>
  <used>71</used>
  <free>19</free>
  <zone-req>71</zone-req>
  <zone-name>UMA Slabs:</zone-name>
  <zone-size>64</zone-size>
  <count-limit>0</count-limit>
  <used>490</used>
  <free>41</free>
  <zone-req>579</zone-req>
  <zone-name>UMA RCntSlabs:</zone-name>
  <zone-size>104</zone-size>
  <count-limit>0</count-limit>
  <used>276</used>
  <free>20</free>
  <zone-req>276</zone-req>
  <zone-name>UMA Hash:</zone-name>
  <zone-size>128</zone-size>
  <count-limit>0</count-limit>
  <used>4</used>
  <free>26</free>
  <zone-req>5</zone-req>
  <zone-name>16 Bucket:</zone-name>
  <zone-size>76</zone-size>
  <count-limit>0</count-limit>
  <used>30</used>
  <free>20</free>
  <zone-req>30</zone-req>
  <zone-name>32 Bucket:</zone-name>
  <zone-size>140</zone-size>
  <count-limit>0</count-limit>
  <used>33</used>
  <free>23</free>
```

```

<zone-req>33</zone-req>
<zone-name>64 Bucket:</zone-name>
<zone-size>268</zone-size>
<count-limit>0</count-limit>
<used>33</used>
<free>9</free>
<zone-req>33</zone-req>
<zone-name>128 Bucket:</zone-name>
<zone-size>524</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>0</free>
<zone-req>49</zone-req>
<zone-name>VM OBJECT:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>2111</used>
<free>79</free>
<zone-req>25214</zone-req>
<zone-name>MAP:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>7</used>
<free>41</free>
<zone-req>7</zone-req>
<zone-name>KMAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>35336</count-limit>
<used>19</used>
<free>149</free>
<zone-req>2397</zone-req>
<zone-name>MAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2031</used>
<free>153</free>
<zone-req>62417</zone-req>
<zone-name>PV ENTRY:</zone-name>
<zone-size>24</zone-size>
<count-limit>509095</count-limit>
<used>57177</used>
<free>6333</free>
<zone-req>1033683</zone-req>
<zone-name>DP fakepg:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mt_zone:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>238</used>
<free>57</free>
<zone-req>238</zone-req>
<zone-name>16:</zone-name>
<zone-size>16</zone-size>
<count-limit>0</count-limit>
<used>2114</used>
<free>119</free>
<zone-req>80515</zone-req>

```

```
<zone-name>32:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>1335</used>
<free>134</free>
<zone-req>10259</zone-req>
<zone-name>64:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>3529</used>
<free>129</free>
<zone-req>29110</zone-req>
<zone-name>96:</zone-name>
<zone-size>96</zone-size>
<count-limit>0</count-limit>
<used>2062</used>
<free>58</free>
<zone-req>4365</zone-req>
<zone-name>112:</zone-name>
<zone-size>112</zone-size>
<count-limit>0</count-limit>
<used>361</used>
<free>164</free>
<zone-req>24613</zone-req>
<zone-name>128:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>359</used>
<free>61</free>
<zone-req>942</zone-req>
<zone-name>160:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>364</used>
<free>44</free>
<zone-req>577</zone-req>
<zone-name>224:</zone-name>
<zone-size>224</zone-size>
<count-limit>0</count-limit>
<used>422</used>
<free>20</free>
<zone-req>1950</zone-req>
<zone-name>256:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
<used>204</used>
<free>36</free>
<zone-req>1225</zone-req>
<zone-name>288:</zone-name>
<zone-size>288</zone-size>
<count-limit>0</count-limit>
<used>2</used>
<free>24</free>
<zone-req>10</zone-req>
<zone-name>512:</zone-name>
<zone-size>512</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>7</free>
<zone-req>911</zone-req>
<zone-name>1024:</zone-name>
```

```
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>213</used>
<free>11</free>
<zone-req>1076</zone-req>
<zone-name>2048:</zone-name>
<zone-size>2048</zone-size>
<count-limit>0</count-limit>
<used>199</used>
<free>113</free>
<zone-req>640</zone-req>
<zone-name>4096:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>144</used>
<free>7</free>
<zone-req>2249</zone-req>
<zone-name>Files:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>665</used>
<free>77</free>
<zone-req>16457</zone-req>
<zone-name>MAC labels:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>3998</used>
<free>227</free>
<zone-req>21947</zone-req>
<zone-name>PROC:</zone-name>
<zone-size>544</zone-size>
<count-limit>0</count-limit>
<used>116</used>
<free>10</free>
<zone-req>1394</zone-req>
<zone-name>THREAD:</zone-name>
<zone-size>416</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>17</free>
<zone-req>131</zone-req>
<zone-name>KSEGRP:</zone-name>
<zone-size>88</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>73</free>
<zone-req>131</zone-req>
<zone-name>UPCALL:</zone-name>
<zone-size>44</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>SLEEPQUEUE:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>145</used>
<free>194</free>
<zone-req>145</zone-req>
<zone-name>VMSPACE:</zone-name>
<zone-size>268</zone-size>
```

```
<count-limit>0</count-limit>
<used>57</used>
<free>13</free>
<zone-req>1335</zone-req>
<zone-name>mbuf_packet:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>256</used>
<free>128</free>
<zone-req>49791</zone-req>
<zone-name>mbuf:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>50</used>
<free>466</free>
<zone-req>105183</zone-req>
<zone-name>mbuf_cluster:</zone-name>
<zone-size>2048</zone-size>
<count-limit>25190</count-limit>
<used>387</used>
<free>165</free>
<zone-req>5976</zone-req>
<zone-name>mbuf_jumbo_pagesize:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_9k:</zone-name>
<zone-size>9216</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_16k:</zone-name>
<zone-size>16384</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>ACL UMA zone:</zone-name>
<zone-size>388</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>g_bio:</zone-name>
<zone-size>132</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>174</free>
<zone-req>69750</zone-req>
<zone-name>ata_request:</zone-name>
<zone-size>200</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>57</free>
<zone-req>5030</zone-req>
<zone-name>ata_composite:</zone-name>
<zone-size>192</zone-size>
<count-limit>0</count-limit>
```

```

<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>GENCFG:</zone-name>
<zone-size>72</zone-size>
<count-limit>1000004</count-limit>
<used>57</used>
<free>102</free>
<zone-req>57</zone-req>
<zone-name>VNODE:</zone-name>
<zone-size>292</zone-size>
<count-limit>0</count-limit>
<used>2718</used>
<free>25</free>
<zone-req>2922</zone-req>
<zone-name>VNODEPOLL:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>S VFS Cache:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2500</used>
<free>76</free>
<zone-req>3824</zone-req>
<zone-name>L VFS Cache:</zone-name>
<zone-size>291</zone-size>
<count-limit>0</count-limit>
<used>51</used>
<free>14</free>
<zone-req>63</zone-req>
<zone-name>NAMEI:</zone-name>
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>8</free>
<zone-req>53330</zone-req>
<zone-name>NFSMOUNT:</zone-name>
<zone-size>480</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>NFSNODE:</zone-name>
<zone-size>460</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>PIPE:</zone-name>
<zone-size>404</zone-size>
<count-limit>0</count-limit>
<used>27</used>
<free>9</free>
<zone-req>717</zone-req>
<zone-name>KNOTE:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>42</used>

```

```
<free>64</free>
<zone-req>3311</zone-req>
<zone-name>socket:</zone-name>
<zone-size>412</zone-size>
<count-limit>25191</count-limit>
<used>343</used>
<free>8</free>
<zone-req>2524</zone-req>
<zone-name>unpcb:</zone-name>
<zone-size>140</zone-size>
<count-limit>25200</count-limit>
<used>170</used>
<free>26</free>
<zone-req>2157</zone-req>
<zone-name>ipq:</zone-name>
<zone-size>52</zone-size>
<count-limit>216</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>udpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>19</used>
<free>32</free>
<zone-req>31</zone-req>
<zone-name>inpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>40</used>
<free>28</free>
<zone-req>105</zone-req>
<zone-name>tcpcb:</zone-name>
<zone-size>520</zone-size>
<count-limit>25193</count-limit>
<used>40</used>
<free>16</free>
<zone-req>105</zone-req>
<zone-name>tcptw:</zone-name>
<zone-size>56</zone-size>
<count-limit>5092</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>syncache:</zone-name>
<zone-size>128</zone-size>
<count-limit>15360</count-limit>
<used>0</used>
<free>60</free>
<zone-req>55</zone-req>
<zone-name>tcpreass:</zone-name>
<zone-size>20</zone-size>
<count-limit>1690</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>sackhole:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
```



```

    <zone-req>0</zone-req>
    <zone-name>ripcb:</zone-name>
    <zone-size>232</zone-size>
    <count-limit>25194</count-limit>
    <used>5</used>
    <free>29</free>
    <zone-req>5</zone-req>
    <zone-name>SWAPMETA:</zone-name>
    <zone-size>276</zone-size>
    <count-limit>94948</count-limit>
    <used>0</used>
    <free>0</free>
    <zone-req>0</zone-req>
    <zone-name>FFS inode:</zone-name>
    <zone-size>132</zone-size>
    <count-limit>0</count-limit>
    <used>1146</used>
    <free>72</free>
    <zone-req>1306</zone-req>
    <zone-name>FFS1 dinode:</zone-name>
    <zone-size>128</zone-size>
    <count-limit>0</count-limit>
    <used>1146</used>
    <free>24</free>
    <zone-req>1306</zone-req>
    <zone-name>FFS2 dinode:</zone-name>
    <zone-size>256</zone-size>
    <count-limit>0</count-limit>
    <used>0</used>
    <free>0</free>
    <zone-req>0</zone-req>
</vmstat-memstat-zone>
<vmstat-sumstat>
    <cpu-context-switch>934906</cpu-context-switch>
    <dev-intr>1707986</dev-intr>
    <soft-intr>33819</soft-intr>
    <traps>203604</traps>
    <sys-calls>1200636</sys-calls>
    <kernel-thrds>60</kernel-thrds>
    <fork-calls>1313</fork-calls>
    <vfork-calls>21</vfork-calls>
    <rfork-calls>0</rfork-calls>
    <swap-pageins>0</swap-pageins>
    <swap-pagedin>0</swap-pagedin>
    <swap-pageouts>0</swap-pageouts>
    <swap-pagedout>0</swap-pagedout>
    <vnode-pageins>23094</vnode-pageins>
    <vnode-pagedin>23119</vnode-pagedin>
    <vnode-pageouts>226</vnode-pageouts>
    <vnode-pagedout>3143</vnode-pagedout>
    <page-daemon-wakeup>0</page-daemon-wakeup>
    <page-daemon-examined-pages>0</page-daemon-examined-pages>
    <pages-reactivated>8821</pages-reactivated>
    <copy-on-write-faults>48364</copy-on-write-faults>
    <copy-on-write-optimized-faults>31</copy-on-write-optimized-faults>
    <zero-fill-pages-zeroed>74665</zero-fill-pages-zeroed>
    <zero-fill-pages-prezeroed>70061</zero-fill-pages-prezeroed>
    <transit-blocking-page-faults>85</transit-blocking-page-faults>
    <total-vm-faults>191824</total-vm-faults>

<pages-affected-by-kernel-thrd-creat>0</pages-affected-by-kernel-thrd-creat>

```

```

    <pages-affected-by-fork>95343</pages-affected-by-fork>
    <pages-affected-by-vfork>3526</pages-affected-by-vfork>
    <pages-affected-by-rfork>0</pages-affected-by-rfork>
    <pages-freed>221502</pages-freed>
    <pages-freed-by-daemon>0</pages-freed-by-daemon>
    <pages-freed-by-exiting-proc>75630</pages-freed-by-exiting-proc>
    <pages-active>45826</pages-active>
    <pages-inactive>13227</pages-inactive>
    <pages-in-vm-cache>49278</pages-in-vm-cache>
    <pages-wired-down>10640</pages-wired-down>
    <pages-free>70706</pages-free>
    <bytes-per-page>4096</bytes-per-page>
    <swap-pages-used>0</swap-pages-used>
    <peak-swap-pages-used>0</peak-swap-pages-used>
    <total-name-lookups>214496</total-name-lookups>
    <positive-cache-hits>92</positive-cache-hits>
    <negative-cache-hits>5</negative-cache-hits>
    <pass2>0</pass2>
    <cache-deletions>0</cache-deletions>
    <cache-falsehits>0</cache-falsehits>
    <toolong>0</toolong>
  </vmstat-sumstat>
  <vmstat-intr>
    <intr-name>irq0: clk          </intr-name>
    <intr-cnt>1243455</intr-cnt>
    <intr-rate>999</intr-rate>
    <intr-name>irq4: sio0        </intr-name>
    <intr-cnt>1140</intr-cnt>
    <intr-rate>0</intr-rate>
    <intr-name>irq8: rtc         </intr-name>
    <intr-cnt>159164</intr-cnt>
    <intr-rate>127</intr-rate>
    <intr-name>irq9: cbb1 fxp0   </intr-name>
    <intr-cnt>28490</intr-cnt>
    <intr-rate>22</intr-rate>
    <intr-name>irq10: fxp1       </intr-name>
    <intr-cnt>20593</intr-cnt>
    <intr-rate>16</intr-rate>
    <intr-name>irq14: ata0       </intr-name>
    <intr-cnt>5031</intr-cnt>
    <intr-rate>4</intr-rate>
    <intr-name>Total</intr-name>
    <intr-cnt>1457873</intr-cnt>
    <intr-rate>1171</intr-rate>
  </vmstat-intr>
  <vm-kernel-state>
    <vm-kmem-map-free>248524800</vm-kmem-map-free>
  </vm-kernel-state>
  <kernel-direct-mm-size-information>
    <vm-directmm-size-used>4644</vm-directmm-size-used>
    <vm-directmm-size-max>4057334</vm-directmm-size-max>
  </kernel-direct-mm-size-information>
</system-virtual-memory-information>
<cli>
  <banner></banner>
</cli>
</rpc-reply>

```

Note: <kernel-direct-mm-size-information> only displays for 64 bit platform.

show system virtual-memory (QFX Series)

```

user@switch> show system virtual-memory | display xml
<rpc-reply xmlns:junos="http://device1.example.com/junos/11.1R1/junos">
  <system-virtual-memory-information>
    <vmstat-memstat-malloc>
      <memstat-name>CAM dev queue</memstat-name>
      <inuse>1</inuse>
      <memuse>1</memuse>
      <high-use>-</high-use>
      <memstat-req>1</memstat-req>
      <memstat-size>64</memstat-size>
      <memstat-name>entropy</memstat-name>
      <inuse>1024</inuse>
      <memuse>64</memuse>
      <high-use>-</high-use>
      <memstat-req>1024</memstat-req>
      <memstat-size>64</memstat-size>
      <memstat-name>linker</memstat-name>
      <inuse>481</inuse>
      <memuse>1871</memuse>
      <high-use>-</high-use>
      <memstat-req>1145</memstat-req>
      <memstat-size>16,32,64,4096,32768,131072</memstat-size>
      <memstat-name>lockf</memstat-name>
      <inuse>56</inuse>
      <memuse>4</memuse>
      <high-use>-</high-use>
      <memstat-req>5998</memstat-req>
      <memstat-size>64</memstat-size>
      <memstat-name>devbuf</memstat-name>
      <inuse>2094</inuse>
      <memuse>3877</memuse>
      <high-use>-</high-use>
      <memstat-req>2099</memstat-req>

      <memstat-size>16,32,64,128,512,1024,4096,8192,16384,32768,65536,131072</memstat-size>

      <memstat-name>temp</memstat-name>
      <inuse>21</inuse>
      <memuse>66</memuse>
      <high-use>-</high-use>
      <memstat-req>3127</memstat-req>

      <memstat-size>16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072</memstat-size>

      <memstat-name>ip6ndp</memstat-name>
      <inuse>0</inuse>
      <memuse>0</memuse>
      <high-use>-</high-use>
      <memstat-req>4</memstat-req>
      <memstat-size>64</memstat-size>
      <memstat-name>in6ifmulti</memstat-name>
      <inuse>1</inuse>
      <memuse>1</memuse>
      <high-use>-</high-use>
      <memstat-req>1</memstat-req>
      <memstat-size>64</memstat-size>
      <memstat-name>in6grentry</memstat-name>
      <inuse>1</inuse>
      <memuse>1</memuse>

```

```
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>iflogical</memstat-name>
<inuse>13</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>
<memstat-size>64,2048</memstat-size>
<memstat-name>iffamily</memstat-name>
<inuse>28</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>28</memstat-req>
<memstat-size>32,1024,2048</memstat-size>
<memstat-name>rtnextthop</memstat-name>
<inuse>127</inuse>
<memuse>18</memuse>
<high-use>--</high-use>
<memstat-req>129</memstat-req>
<memstat-size>32,256,512,1024,2048,4096</memstat-size>
<memstat-name>metrics</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>inifmulti</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>3</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>ingrentry</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>rnode</memstat-name>
<inuse>68</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>76</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rcache</memstat-name>
<inuse>4</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ifdevice</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>ifstat</memstat-name>
<inuse>40</inuse>
<memuse>22</memuse>
<high-use>--</high-use>
```

```

    <memstat-req>40</memstat-req>
    <memstat-size>512,16384,32768</memstat-size>
    <memstat-name>ipfw</memstat-name>
    <inuse>42</inuse>
    <memuse>23</memuse>
    <high-use>--</high-use>
    <memstat-req>91</memstat-req>

<memstat-size>16,32,64,128,256,512,1024,16384,32768,65536,131072</memstat-size>
    <memstat-name>ifmaddr</memstat-name>
    <inuse>103</inuse>
    <memuse>3</memuse>
    <high-use>--</high-use>
    <memstat-req>103</memstat-req>
    <memstat-size>16,32</memstat-size>
    <memstat-name>rtable</memstat-name>
    <inuse>129</inuse>
    <memuse>14</memuse>
    <high-use>--</high-use>
    <memstat-req>139</memstat-req>
    <memstat-size>16,32,64,128,1024,16384</memstat-size>
    <memstat-name>sysctl</memstat-name>
    <inuse>0</inuse>
    <memuse>0</memuse>
    <high-use>--</high-use>
    <memstat-req>14847</memstat-req>
    <memstat-size>16,32,64,4096,16384,32768</memstat-size>
    <memstat-name>ifaddr</memstat-name>
    <inuse>29</inuse>
    <memuse>3</memuse>
    <high-use>--</high-use>
    <memstat-req>29</memstat-req>
    <memstat-size>64,128</memstat-size>
    <memstat-name>mkey</memstat-name>
    <inuse>345</inuse>
    <memuse>6</memuse>
    <high-use>--</high-use>
    <memstat-req>2527</memstat-req>
    <memstat-size>16,128</memstat-size>
    <memstat-name>pfe_ipc</memstat-name>
    <inuse>0</inuse>
    <memuse>0</memuse>
    <high-use>--</high-use>
    <memstat-req>1422</memstat-req>

<memstat-size>16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072</memstat-size>

    <memstat-name>ifstate</memstat-name>
    <inuse>594</inuse>
    <memuse>51</memuse>
    <high-use>--</high-use>
    <memstat-req>655</memstat-req>

<memstat-size>16,32,64,128,256,1024,2048,4096,16384,32768</memstat-size>
    <memstat-name>itable16</memstat-name>
    <inuse>276</inuse>
    <memuse>52</memuse>
    <high-use>--</high-use>
    <memstat-req>294</memstat-req>
    <memstat-size>1024,4096</memstat-size>
    <memstat-name>itable32</memstat-name>

```

```

<inuse>160</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>160</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>itable64</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>lr</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>pic</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64,512</memstat-size>
<memstat-name>pfestat</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>162</memstat-req>
<memstat-size>16,32,128,256,16384</memstat-size>
<memstat-name>gencfg</memstat-name>
<inuse>224</inuse>
<memuse>56</memuse>
<high-use>--</high-use>
<memstat-req>540</memstat-req>
<memstat-size>16,32,64,256,512,32768,65536</memstat-size>
<memstat-name>jsr</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>idl</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>
<memstat-size>16,32,64,128,256,4096,16384,32768,131072</memstat-size>

<memstat-name>rtsmsg</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>module</memstat-name>
<inuse>249</inuse>
<memuse>16</memuse>
<high-use>--</high-use>
<memstat-req>249</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>mtx_pool</memstat-name>

```

```

<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>DEVFS3</memstat-name>
<inuse>109</inuse>
<memuse>12</memuse>
<high-use>--</high-use>
<memstat-req>117</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>DEVFS1</memstat-name>
<inuse>102</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>109</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>pgrp</memstat-name>
<inuse>12</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>session</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>proc</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>subproc</memstat-name>
<inuse>244</inuse>
<memuse>496</memuse>
<high-use>--</high-use>
<memstat-req>1522</memstat-req>
<memstat-size>2048,131072</memstat-size>
<memstat-name>cred</memstat-name>
<inuse>30</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>11409</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>plimit</memstat-name>
<inuse>17</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>133</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>uidinfo</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>32,512</memstat-size>
<memstat-name>sysctluid</memstat-name>
<inuse>1117</inuse>

```

```
<memuse>34</memuse>
<high-use>--</high-use>
<memstat-req>1117</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sysctltmp</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>743</memstat-req>
<memstat-size>16,32,64,1024</memstat-size>
<memstat-name>umtx</memstat-name>
<inuse>144</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>144</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>SWAP</memstat-name>
<inuse>2</inuse>
<memuse>209</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>bus</memstat-name>
<inuse>496</inuse>
<memuse>55</memuse>
<high-use>--</high-use>
<memstat-req>1196</memstat-req>
<memstat-size>16,32,64,128,32768</memstat-size>
<memstat-name>bus-sc</memstat-name>
<inuse>23</inuse>
<memuse>33</memuse>
<high-use>--</high-use>
<memstat-req>335</memstat-req>

<memstat-size>16,32,64,512,1024,2048,8192,16384,65536,131072</memstat-size>
<memstat-name>devstat</memstat-name>
<inuse>10</inuse>
<memuse>21</memuse>
<high-use>--</high-use>
<memstat-req>10</memstat-req>
<memstat-size>16,131072</memstat-size>
<memstat-name>eventhandler</memstat-name>
<inuse>35</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>36</memstat-req>
<memstat-size>32,128</memstat-size>
<memstat-name>kobj</memstat-name>
<inuse>93</inuse>
<memuse>186</memuse>
<high-use>--</high-use>
<memstat-req>111</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>DEVFS</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>rman</memstat-name>
<inuse>71</inuse>
```



```

<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>433</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sbuf</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>522</memstat-req>
<memstat-size>16,32,32768,131072</memstat-size>
<memstat-name>NULLFS hash</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>taskqueue</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>turnstiles</memstat-name>
<inuse>145</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>145</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>Unitno</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>44</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>iocltops</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>27622</memstat-req>
<memstat-size>16,64,8192,16384,131072</memstat-size>
<memstat-name>iov</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>18578</memstat-req>
<memstat-size>16,64,128,256,512,1024,2048,131072</memstat-size>
<memstat-name>msg</memstat-name>
<inuse>4</inuse>
<memuse>25</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32768,131072</memstat-size>
<memstat-name>sem</memstat-name>
<inuse>4</inuse>
<memuse>7</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16384,32768,131072</memstat-size>
<memstat-name>shm</memstat-name>
<inuse>9</inuse>
<memuse>20</memuse>

```

```

<high-use>--</high-use>
<memstat-req>14</memstat-req>
<memstat-size>32768</memstat-size>
<memstat-name>ttys</memstat-name>
<inuse>321</inuse>
<memuse>61</memuse>
<high-use>--</high-use>
<memstat-req>528</memstat-req>
<memstat-size>512,32768</memstat-size>
<memstat-name>ptys</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>mbuf_tag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>23383</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>soname</memstat-name>
<inuse>115</inuse>
<memuse>12</memuse>
<high-use>--</high-use>
<memstat-req>24712</memstat-req>
<memstat-size>16,32,64,256</memstat-size>
<memstat-name>pcb</memstat-name>
<inuse>216</inuse>
<memuse>33</memuse>
<high-use>--</high-use>
<memstat-req>484</memstat-req>
<memstat-size>16,32,64,128,1024,2048,4096,16384,32768,65536</memstat-size>
<memstat-name>BIO buffer</memstat-name>
<inuse>43</inuse>
<memuse>86</memuse>
<high-use>--</high-use>
<memstat-req>405</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>vfscache</memstat-name>
<inuse>1</inuse>
<memuse>256</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>cluster_save buffer</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32,64</memstat-size>
<memstat-name>VFS hash</memstat-name>
<inuse>1</inuse>
<memuse>128</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32,64</memstat-size>
<memstat-name>vnodes</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>

```

```

<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>mount</memstat-name>
<inuse>290</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>535</memstat-req>
<memstat-size>16,32,64,128,256,4096,32768</memstat-size>
<memstat-name>vnodemarker</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>498</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>pfs_nodes</memstat-name>
<inuse>25</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>25</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>pfs_vncache</memstat-name>
<inuse>27</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>53</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>STP</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>GEOM</memstat-name>
<inuse>146</inuse>
<memuse>11</memuse>
<high-use>--</high-use>
<memstat-req>1042</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>syncache</memstat-name>
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>tlv_stat</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>8</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>NFS_daemon</memstat-name>
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>

```

```
<memstat-name>p1003.1b</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>MD disk</memstat-name>
<inuse>10</inuse>
<memuse>20</memuse>
<high-use>--</high-use>
<memstat-req>10</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ata_generic</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>16,16384,32768</memstat-size>
<memstat-name>ISofs mount</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>ISofs node</memstat-name>
<inuse>1440</inuse>
<memuse>135</memuse>
<high-use>--</high-use>
<memstat-req>1457</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>CAM SIM</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>CAM XPT</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64,16384</memstat-size>
<memstat-name>CAM periph</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ad_driver</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>pagedep</memstat-name>
<inuse>1</inuse>
<memuse>32</memuse>
<high-use>--</high-use>
<memstat-req>106</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>inodedep</memstat-name>
```

```

<inuse>1</inuse>
<memuse>128</memuse>
<high-use>--</high-use>
<memstat-req>464</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>newblk</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>336</memstat-req>
<memstat-size>64,4096</memstat-size>
<memstat-name>bmsafemap</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>63</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>allocdirect</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>320</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>indirdep</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>17</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>allocindir</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>freefrag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>12</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>freeblks</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>40</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>freefile</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>101</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>diradd</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>465</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>mkdir</memstat-name>
<inuse>0</inuse>

```

```
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>136</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>dirrem</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>168</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>newdirblk</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>savedino</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>157</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>UFS mount</memstat-name>
<inuse>15</inuse>
<memuse>36</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>2048,65536,131072</memstat-size>
<memstat-name>ata_dma</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>UMAHash</memstat-name>
<inuse>1</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>4096,16384,32768,65536</memstat-size>
<memstat-name>cdev</memstat-name>
<inuse>22</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>22</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>file desc</memstat-name>
<inuse>141</inuse>
<memuse>32</memuse>
<high-use>--</high-use>
<memstat-req>1583</memstat-req>
<memstat-size>16,1024,2048,16384</memstat-size>
<memstat-name>VM pgdata</memstat-name>
<inuse>2</inuse>
<memuse>65</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>sigio</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
```

```

<high-use>--</high-use>
<memstat-req>20</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kenv</memstat-name>
<inuse>24</inuse>
<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>27</memstat-req>
<memstat-size>16,32,64,131072</memstat-size>
<memstat-name>atkbddev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kqueue</memstat-name>
<inuse>15</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>19</memstat-req>
<memstat-size>1024,4096,32768</memstat-size>
<memstat-name>proc-args</memstat-name>
<inuse>57</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>1001</memstat-req>
<memstat-size>16,32,64,128,256,512,1024</memstat-size>
<memstat-name>isadev</memstat-name>
<inuse>21</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>zombie</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>1278</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ithread</memstat-name>
<inuse>69</inuse>
<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>69</memstat-req>
<memstat-size>16,64,256</memstat-size>
<memstat-name>legacydrv</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>memdesc</memstat-name>
<inuse>1</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>nexusdev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>

```

```

<memstat-req>2</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>CAM queue</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>3</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>$PIR</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>KTRACE</memstat-name>
<inuse>100</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>100</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>kbdmux</memstat-name>
<inuse>5</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>128,2048,65536,131072</memstat-size>
</vmstat-memstat-malloc>
<vmstat-memstat-zone>
  <zone-name>UMA Kegs:</zone-name>
  <zone-size>136</zone-size>
  <count-limit>0</count-limit>
  <used>71</used>
  <free>1</free>
  <zone-req>71</zone-req>
  <zone-name>UMA Zones:</zone-name>
  <zone-size>120</zone-size>
  <count-limit>0</count-limit>
  <used>71</used>
  <free>19</free>
  <zone-req>71</zone-req>
  <zone-name>UMA Slabs:</zone-name>
  <zone-size>64</zone-size>
  <count-limit>0</count-limit>
  <used>490</used>
  <free>41</free>
  <zone-req>579</zone-req>
  <zone-name>UMA RCntSlabs:</zone-name>
  <zone-size>104</zone-size>
  <count-limit>0</count-limit>
  <used>276</used>
  <free>20</free>
  <zone-req>276</zone-req>
  <zone-name>UMA Hash:</zone-name>
  <zone-size>128</zone-size>
  <count-limit>0</count-limit>
  <used>4</used>
  <free>26</free>
  <zone-req>5</zone-req>
  <zone-name>16 Bucket:</zone-name>
  <zone-size>76</zone-size>
  <count-limit>0</count-limit>

```



```

<used>30</used>
<free>20</free>
<zone-req>30</zone-req>
<zone-name>32 Bucket:</zone-name>
<zone-size>140</zone-size>
<count-limit>0</count-limit>
<used>33</used>
<free>23</free>
<zone-req>33</zone-req>
<zone-name>64 Bucket:</zone-name>
<zone-size>268</zone-size>
<count-limit>0</count-limit>
<used>33</used>
<free>9</free>
<zone-req>33</zone-req>
<zone-name>128 Bucket:</zone-name>
<zone-size>524</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>0</free>
<zone-req>49</zone-req>
<zone-name>VM OBJECT:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>2111</used>
<free>79</free>
<zone-req>25214</zone-req>
<zone-name>MAP:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>7</used>
<free>41</free>
<zone-req>7</zone-req>
<zone-name>KMAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>35336</count-limit>
<used>19</used>
<free>149</free>
<zone-req>2397</zone-req>
<zone-name>MAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2031</used>
<free>153</free>
<zone-req>62417</zone-req>
<zone-name>PV ENTRY:</zone-name>
<zone-size>24</zone-size>
<count-limit>509095</count-limit>
<used>57177</used>
<free>6333</free>
<zone-req>1033683</zone-req>
<zone-name>DP fakepg:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mt_zone:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>238</used>

```

```
<free>57</free>
<zone-req>238</zone-req>
<zone-name>16:</zone-name>
<zone-size>16</zone-size>
<count-limit>0</count-limit>
<used>2114</used>
<free>119</free>
<zone-req>80515</zone-req>
<zone-name>32:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>1335</used>
<free>134</free>
<zone-req>10259</zone-req>
<zone-name>64:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>3529</used>
<free>129</free>
<zone-req>29110</zone-req>
<zone-name>96:</zone-name>
<zone-size>96</zone-size>
<count-limit>0</count-limit>
<used>2062</used>
<free>58</free>
<zone-req>4365</zone-req>
<zone-name>112:</zone-name>
<zone-size>112</zone-size>
<count-limit>0</count-limit>
<used>361</used>
<free>164</free>
<zone-req>24613</zone-req>
<zone-name>128:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>359</used>
<free>61</free>
<zone-req>942</zone-req>
<zone-name>160:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>364</used>
<free>44</free>
<zone-req>577</zone-req>
<zone-name>224:</zone-name>
<zone-size>224</zone-size>
<count-limit>0</count-limit>
<used>422</used>
<free>20</free>
<zone-req>1950</zone-req>
<zone-name>256:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
<used>204</used>
<free>36</free>
<zone-req>1225</zone-req>
<zone-name>288:</zone-name>
<zone-size>288</zone-size>
<count-limit>0</count-limit>
<used>2</used>
<free>24</free>
```

```
<zone-req>10</zone-req>
<zone-name>512:</zone-name>
<zone-size>512</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>7</free>
<zone-req>911</zone-req>
<zone-name>1024:</zone-name>
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>213</used>
<free>11</free>
<zone-req>1076</zone-req>
<zone-name>2048:</zone-name>
<zone-size>2048</zone-size>
<count-limit>0</count-limit>
<used>199</used>
<free>113</free>
<zone-req>640</zone-req>
<zone-name>4096:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>144</used>
<free>7</free>
<zone-req>2249</zone-req>
<zone-name>Files:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>665</used>
<free>77</free>
<zone-req>16457</zone-req>
<zone-name>MAC labels:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>3998</used>
<free>227</free>
<zone-req>21947</zone-req>
<zone-name>PROC:</zone-name>
<zone-size>544</zone-size>
<count-limit>0</count-limit>
<used>116</used>
<free>10</free>
<zone-req>1394</zone-req>
<zone-name>THREAD:</zone-name>
<zone-size>416</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>17</free>
<zone-req>131</zone-req>
<zone-name>KSEGRP:</zone-name>
<zone-size>88</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>73</free>
<zone-req>131</zone-req>
<zone-name>UPCALL:</zone-name>
<zone-size>44</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
```

```
<zone-name>SLEEPQUEUE:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>145</used>
<free>194</free>
<zone-req>145</zone-req>
<zone-name>VMSPACE:</zone-name>
<zone-size>268</zone-size>
<count-limit>0</count-limit>
<used>57</used>
<free>13</free>
<zone-req>1335</zone-req>
<zone-name>mbuf_packet:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>256</used>
<free>128</free>
<zone-req>49791</zone-req>
<zone-name>mbuf:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>50</used>
<free>466</free>
<zone-req>105183</zone-req>
<zone-name>mbuf_cluster:</zone-name>
<zone-size>2048</zone-size>
<count-limit>25190</count-limit>
<used>387</used>
<free>165</free>
<zone-req>5976</zone-req>
<zone-name>mbuf_jumbo_pagesize:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_9k:</zone-name>
<zone-size>9216</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_16k:</zone-name>
<zone-size>16384</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>ACL UMA zone:</zone-name>
<zone-size>388</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>g_bio:</zone-name>
<zone-size>132</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>174</free>
<zone-req>69750</zone-req>
<zone-name>ata_request:</zone-name>
```

```

<zone-size>200</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>57</free>
<zone-req>5030</zone-req>
<zone-name>ata_composite:</zone-name>
<zone-size>192</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>GENCFG:</zone-name>
<zone-size>72</zone-size>
<count-limit>1000004</count-limit>
<used>57</used>
<free>102</free>
<zone-req>57</zone-req>
<zone-name>VNODE:</zone-name>
<zone-size>292</zone-size>
<count-limit>0</count-limit>
<used>2718</used>
<free>25</free>
<zone-req>2922</zone-req>
<zone-name>VNODEPOLL:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>S VFS Cache:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2500</used>
<free>76</free>
<zone-req>3824</zone-req>
<zone-name>L VFS Cache:</zone-name>
<zone-size>291</zone-size>
<count-limit>0</count-limit>
<used>51</used>
<free>14</free>
<zone-req>63</zone-req>
<zone-name>NAMEI:</zone-name>
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>8</free>
<zone-req>53330</zone-req>
<zone-name>NFSMOUNT:</zone-name>
<zone-size>480</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>NFSNODE:</zone-name>
<zone-size>460</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>PIPE:</zone-name>
<zone-size>404</zone-size>

```

```
<count-limit>0</count-limit>
<used>27</used>
<free>9</free>
<zone-req>717</zone-req>
<zone-name>KNOTE:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>42</used>
<free>64</free>
<zone-req>3311</zone-req>
<zone-name>socket:</zone-name>
<zone-size>412</zone-size>
<count-limit>25191</count-limit>
<used>343</used>
<free>8</free>
<zone-req>2524</zone-req>
<zone-name>unpcb:</zone-name>
<zone-size>140</zone-size>
<count-limit>25200</count-limit>
<used>170</used>
<free>26</free>
<zone-req>2157</zone-req>
<zone-name>ipq:</zone-name>
<zone-size>52</zone-size>
<count-limit>216</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>udpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>19</used>
<free>32</free>
<zone-req>31</zone-req>
<zone-name>inpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>40</used>
<free>28</free>
<zone-req>105</zone-req>
<zone-name>tcpcb:</zone-name>
<zone-size>520</zone-size>
<count-limit>25193</count-limit>
<used>40</used>
<free>16</free>
<zone-req>105</zone-req>
<zone-name>tcptw:</zone-name>
<zone-size>56</zone-size>
<count-limit>5092</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>syncache:</zone-name>
<zone-size>128</zone-size>
<count-limit>15360</count-limit>
<used>0</used>
<free>60</free>
<zone-req>55</zone-req>
<zone-name>tcpreass:</zone-name>
<zone-size>20</zone-size>
<count-limit>1690</count-limit>
```

```

<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>sackhole:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>ripcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>5</used>
<free>29</free>
<zone-req>5</zone-req>
<zone-name>SWAPMETA:</zone-name>
<zone-size>276</zone-size>
<count-limit>94948</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>FFS inode:</zone-name>
<zone-size>132</zone-size>
<count-limit>0</count-limit>
<used>1146</used>
<free>72</free>
<zone-req>1306</zone-req>
<zone-name>FFS1 dinode:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>1146</used>
<free>24</free>
<zone-req>1306</zone-req>
<zone-name>FFS2 dinode:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
</vmstat-memstat-zone>
<vmstat-sumstat>
  <cpu-context-switch>934906</cpu-context-switch>
  <dev-intr>1707986</dev-intr>
  <soft-intr>33819</soft-intr>
  <traps>203604</traps>
  <sys-calls>1200636</sys-calls>
  <kernel-thrds>60</kernel-thrds>
  <fork-calls>1313</fork-calls>
  <vfork-calls>21</vfork-calls>
  <rfork-calls>0</rfork-calls>
  <swap-pageins>0</swap-pageins>
  <swap-pagedin>0</swap-pagedin>
  <swap-pageouts>0</swap-pageouts>
  <swap-pagedout>0</swap-pagedout>
  <vnode-pageins>23094</vnode-pageins>
  <vnode-pagedin>23119</vnode-pagedin>
  <vnode-pageouts>226</vnode-pageouts>
  <vnode-pagedout>3143</vnode-pagedout>
  <page-daemon-wakeup>0</page-daemon-wakeup>
  <page-daemon-examined-pages>0</page-daemon-examined-pages>
  <pages-reactivated>8821</pages-reactivated>

```

```

<copy-on-write-faults>48364</copy-on-write-faults>
<copy-on-write-optimized-faults>31</copy-on-write-optimized-faults>
<zero-fill-pages-zeroed>74665</zero-fill-pages-zeroed>
<zero-fill-pages-prezeroed>70061</zero-fill-pages-prezeroed>
<transit-blocking-page-faults>85</transit-blocking-page-faults>
<total-vm-faults>191824</total-vm-faults>

<pages-affected-by-kernel-thrd-creat>0</pages-affected-by-kernel-thrd-creat>
<pages-affected-by-fork>95343</pages-affected-by-fork>
<pages-affected-by-vfork>3526</pages-affected-by-vfork>
<pages-affected-by-rfork>0</pages-affected-by-rfork>
<pages-freed>221502</pages-freed>
<pages-freed-by-daemon>0</pages-freed-by-daemon>
<pages-freed-by-exiting-proc>75630</pages-freed-by-exiting-proc>
<pages-active>45826</pages-active>
<pages-inactive>13227</pages-inactive>
<pages-in-vm-cache>49278</pages-in-vm-cache>
<pages-wired-down>10640</pages-wired-down>
<pages-free>70706</pages-free>
<bytes-per-page>4096</bytes-per-page>
<swap-pages-used>0</swap-pages-used>
<peak-swap-pages-used>0</peak-swap-pages-used>
<total-name-lookups>214496</total-name-lookups>
<positive-cache-hits>92</positive-cache-hits>
<negative-cache-hits>5</negative-cache-hits>
<pass2>0</pass2>
<cache-deletions>0</cache-deletions>
<cache-falsehits>0</cache-falsehits>
<toolong>0</toolong>
</vmstat-sumstat>
<vmstat-intr>
  <intr-name>irq0: clk      </intr-name>
  <intr-cnt>1243455</intr-cnt>
  <intr-rate>999</intr-rate>
  <intr-name>irq4: sio0     </intr-name>
  <intr-cnt>1140</intr-cnt>
  <intr-rate>0</intr-rate>
  <intr-name>irq8: rtc      </intr-name>
  <intr-cnt>159164</intr-cnt>
  <intr-rate>127</intr-rate>
  <intr-name>irq9: cbb1 fxp0 </intr-name>
  <intr-cnt>28490</intr-cnt>
  <intr-rate>22</intr-rate>
  <intr-name>irq10: fxp1    </intr-name>
  <intr-cnt>20593</intr-cnt>
  <intr-rate>16</intr-rate>
  <intr-name>irq14: ata0    </intr-name>
  <intr-cnt>5031</intr-cnt>
  <intr-rate>4</intr-rate>
  <intr-name>Total</intr-name>
  <intr-cnt>1457873</intr-cnt>
  <intr-rate>1171</intr-rate>
</vmstat-intr>
<vm-kernel-state>
  <vm-kmem-map-free>248524800</vm-kmem-map-free>
</vm-kernel-state>
</system-virtual-memory-information>
<cli>
  <banner></banner>
</cli>
</rpc-reply>

```



```

regress@hager> show system virtual-memory
      Type InUse MemUse HighUse Requests Size(s)
      mtx_pool 1 8K - 1 (F4p)
      DEVFS 63 2K - 64 16,128
      subproc 282 559K - 2131 32768,8388608
      proc 2 1K - 2 262144
      session 6 1K - 19 2048
      pgrp 9 1K - 25 128
      cred 35 5K - 38288 1024
      uidinfo 4 1K - 10 32,128
      plimit 31 8K - 189 32768
      sysctltmp 0 0K - 981 16,32,64,32768
      sysctlroid 862 23K - 862 16,32,64
      umtx 189 9K - 189 64
      ifa_list 14 1K - 14 16
vpls_lc_instance 1 2K - 1 4194304
      ifl_tlv_info 1 1K - 1 16
      mesh-group 4 1K - 4 256
      rtmsg 0 0K - 1021 8388608
      idl 1 20K - 186 32,64,512,4096,65536,8388608
      gencfg 569 2777K - 626
16,32,64,128,256,512,1024,2048,4096,8192,1048576,2097152,4194304
      pfestat 123 34K - 626 16,32,4096,16384,4194304,8388608
      pic 4 2K - 4 32,64,256,2097152
      ifservice 1 1K - 1 32
      lr 1 1K - 1 1048576
      itable64 1 1K - 1 2048
      itable32 189 12K - 189 128
      itable16 372 72K - 378 4096,262144
      ifstate 3072 113K - 3506
16,64,128,256,512,1024,2048,4096,8192,32768,1048576,2097152,4194304
      pfe_ipc 0 0K - 1766
16,32,64,128,256,512,1024,4096,8192,16384,32768,524288,1048576,2097152,4194304,8388608

      mkey 568 9K - 7615 16,256
      socket 2 1K - 2 16
      ifaddr 27 2K - 27 128
      sysctl 23 6K - 43074 16,32,64,128,262144,1048576,2097152

      rtable 115 17K - 117 16,32,256,512,4096,8192,1048576
      ifmaddr 40 2K - 40 16,32
      ipfw 48 25K - 103
16,32,64,256,1024,4096,16384,32768,262144,524288,1048576,2097152,4194304,8388608

      rtdata 1 1K - 1 32
      ifstat 109 158K - 156
32,512,2048,16384,32768,1048576,8388608
      ifdevice 5 3K - 5 16,2097152
      rcache 4 8K - 4 4194304
      rnode 56 2K - 58 16,32
      metrics 3 1K - 4 1024
      rtnexthop 126 17K - 126 16,32,2048,4096,8192,16384,32768,65536

      iffamilly 31 4K - 31 16,32,2048,4096
      iflogical 18 5K - 18 16,128,65536,1048576
      NULLFS node 14 1K - 3102 16
      NULLFS hash 1 1K - 1 128
      bus-sc 19 8K - 82
16,64,128,1024,2048,4096,8192,16384,262144,524288,1048576,2097152,4194304,8388608

```

bus	256	35K	-	425	16, 32, 64, 128, 512, 2097152
devstat	10	21K	-	10	16, 8388608
eventhandler	72	4K	-	72	32, 256, 512
NULLFS mount	6	1K	-	6	16
kobj	72	144K	-	78	4194304
pfs_nodes	25	2K	-	25	256
pfs_vncache	41	2K	-	81	32
rman	38	3K	-	43	16, 32, 256
CAM dev queue	2	1K	-	2	128
sbuf	0	0K	-	427	16, 32, 128, 2048, 2097152
GEOM	142	15K	-	725	
16, 32, 128, 256, 512, 1024, 2048, 16384, 1048576, 2097152					
ISOFS node	4780	449K	-	4780	512
taskqueue	9	1K	-	9	16, 256
turnstiles	190	12K	-	190	128
Unitno	6	1K	-	8	16, 64
iov	0	0K	-	72731	16, 32, 64, 128, 256, 512, 1024, 2048
ioctlops	0	0K	-	12180	
16, 64, 65536, 524288, 1048576, 2097152, 4194304, 8388608					
msg	4	25K	-	4	2097152, 8388608
sem	4	7K	-	4	1048576, 2097152, 8388608
shm	13	76K	-	17	8388608
ttys	157	22K	-	892	2048, 2097152
ptys	1	1K	-	1	512
mbuf_tag	6	1K	-	7293	32, 128
pcb	483	111K	-	2577	
16, 32, 64, 128, 256, 8192, 16384, 65536, 262144, 1048576, 2097152, 4194304, 8388608					
soname	164	18K	-	22803	16, 32, 64, 128, 1024
BIO buffer	102	204K	-	1066	4194304
vfscache	1	512K	-	1	4194304
cluster_save buffer	0	0K	-	40	32, 64
VFS hash	1	256K	-	1	32, 64
vnodes	1	1K	-	1	2048
vnodemarker	0	0K	-	729	524288
mount	226	25K	-	337	16, 32, 64, 512, 1024, 262144, 2097152
ISOFS mount	1	1K	-	1	2048
ifl_idx_mgr	1	1K	-	1	128
CAM queue	7	1K	-	25	16
MD sectors	32	128K	-	32	8388608
MD disk	36	9K	-	36	16, 4194304
CAM SIM	2	1K	-	2	64
CAM periph	3	1K	-	4	256
jlist	1	1K	-	1	64
STP	31	7K	-	31	16, 1024, 2048, 1048576
cdev	26	4K	-	26	1024
synccache	1	8K	-	1	1024
CAM XPT	15	3K	-	46	16, 64, 262144, 1048576, 2097152
tlv_stat	0	0K	-	87	16, 64, 262144, 1048576, 2097152
Aggregator	2	1K	-	2	256
sigio	2	1K	-	3	32
Bridge Domain	4	2K	-	4	16, 1048576
p1003.1b	1	1K	-	1	16
filedesc	176	39K	-	2234	16, 4096, 16384, 1048576, 2097152
kenv	50	6K	-	58	16, 32, 64, 128, 512, 8388608
kqueue	27	13K	-	59	32, 4096, 262144, 2097152
proc-args	69	3K	-	1472	
16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192					
zombie	1	1K	-	1850	256
entropy	1024	48K	-	1024	64
ithread	45	3K	-	45	16, 64, 2048
UART	3	2K	-	3	128, 1048576, 2097152

```

KTRACE      101      8K      -      101  256
USBdev       4       1K      -      11  16,512,1048576
newblk       1       1K      -      1  262144
inodedep     1     256K      -      1  262144
pagedep      1      64K      -      1  262144
UFS mount    18     38K      -      30  65536,4194304,8388608
linker      212    240K      -      325
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,262144,524288,1048576,2097152,4194304,8388608

UMAHash      2     17K      -      10  262144,1048576,2097152,4194304,8388608

lockf       89      6K      -     19507  128
USB        134     10K      -     25616  16,32,64,128,1024,8192,262144,4194304

VM pgdata    1    256K      -      1  16,32,64,128,1024,8192,262144,4194304

temp      4384    656K      -      9085
16,32,64,256,512,1024,2048,4096,65536,262144,1048576,2097152,4194304,8388608
devbuf     290   1556K      -       415
16,32,64,128,256,1024,2048,4096,8192,1048576,2097152,4194304,8388608
cache       2      1K      -       2  16384
DEVFS1      79     18K      -      80  32768
DEVFS3     326     39K      -     327  1024
DEVFS2      79      2K      -     228  16
module     186     12K      -     186  64,128
gresstatevarlog 1     96K      -      1  64,128
DEVFS_RULE   5      1K      -       5  32,262144
KATS         0      0K      -      11  16,32,64,256
crypto       1      1K      -       1  1048576
Export Host   2      2K      -       2  2097152
inpcbpolicy 118     2K      -      790  16
ipsecpolicy 236    37K      -     1580  4096
ITEM          SIZE      LIMIT      USED      FREE  REQUESTS
UMA Kegs:     136,        0,        80,       16,        80
UMA Zones:    392,        0,        80,        1,        80
UMA Slabs:     64,        0,     3588,     129,     5170
UMA RCntSlabs: 104,        0,     147,        1,     147
UMA Hash:     128,        0,        5,       25,        7
16 Bucket:     76,        0,       37,      13,        53
32 Bucket:    140,        0,       31,      25,        53
64 Bucket:    268,        0,       37,        5,        82
128 Bucket:   524,        0,       98,        0,       649
VM OBJECT:    136,        0,    8074,     394,    42585
MAP:          168,        0,        8,       15,         8
KMAP ENTRY:    72,    35828,       31,     181,     9422
MAP ENTRY:     72,        0,    5354,     900,    121777
PV ENTRY:     28,    700278,   148072,   12075,   1346404
DP fakepg:     88,        0,        1,       87,         1
mt_zone:     768,        0,       261,     119,       261
16:           16,        0,    4817,     258,    61005
32:           32,        0,     700,      91,    45307
48:           48,        0,    1752,    120,    73638
64:           64,        0,     830,    114,    27311
80:           80,        0,     458,      70,     3204
96:           96,        0,    9523,      37,    9655
120:          120,        0,     694,      74,    56623
128:          128,        0,     337,    113,    1230
160:          160,        0,     512,      16,    2000
176:          176,        0,     123,       9,     178
208:          208,        0,     351,      29,    2390
232:          232,        0,     270,      19,     466

```

240:	240,	0,	22,	26,	1478
248:	248,	0,	0,	0,	0
256:	256,	0,	210,	15,	253
296:	296,	0,	8,	18,	753
512:	512,	0,	113,	7,	564
1024:	1024,	0,	146,	10,	974
2048:	2048,	0,	239,	577,	5805
4096:	4096,	0,	367,	7,	4011
Files:	80,	0,	1030,	74,	47744
MAC labels:	20,	0,	8479,	140,	67133
PROC:	632,	0,	130,	20,	1979
THREAD:	524,	0,	175,	14,	175
KSEGRP:	100,	0,	175,	35,	175
UPCALL:	44,	0,	0,	0,	0
SLEEPQUEUE:	32,	0,	190,	149,	190
VMSPACE:	328,	0,	68,	28,	1917
mbuf_packet:	256,	88200,	0,	128,	9045
mbuf:	256,	88200,	57,	595,	187328
mbuf_cluster:	2048,	22048,	132,	162,	7694
mbuf_jumbo_pagesize:	4096,	0,	0,	0,	0
mbuf_jumbo_9k:	9216,	0,	0,	0,	0
mbuf_jumbo_16k:	16384,	0,	0,	0,	0
g_bio:	144,	0,	0,	297,	87407
ata_request:	224,	0,	0,	0,	0
ata_composite:	192,	0,	0,	0,	0
GENCFG:	72,	1000004,	249,	69,	266
VNODE:	272,	0,	6149,	11,	9449
VNODEPOLL:	72,	0,	0,	0,	0
NAMEI:	1024,	0,	0,	36,	125321
S VFS Cache:	68,	0,	6099,	61,	7466
L VFS Cache:	291,	0,	224,	23,	228
NFSMOUNT:	488,	0,	0,	0,	0
NFSNODE:	472,	0,	0,	0,	0
PIPE:	404,	0,	69,	12,	1198
KNOTE:	72,	0,	106,	53,	18201
socket:	376,	22050,	566,	14,	7613
unpcb:	144,	22059,	258,	39,	5877
ipq:	52,	216,	0,	0,	0
udp_inpcb:	272,	22050,	21,	21,	43
tcp_inpcb:	272,	22050,	91,	7,	743
tcpcb:	704,	22050,	91,	14,	743
sackhole:	20,	0,	0,	0,	0
tcptw:	60,	4410,	0,	0,	0
syncache:	128,	15360,	0,	60,	25
tcpreass:	20,	1521,	0,	0,	0
ripcb:	272,	22050,	8,	20,	8
SWAPMETA:	280,	322518,	0,	0,	0
FFS inode:	144,	0,	1222,	20,	1387
FFS1 dinode:	128,	0,	1222,	8,	1387
FFS2 dinode:	256,	0,	0,	0,	0
md0:	512,	0,	20183,	17,	20183
cryptop:	64,	0,	0,	0,	0
cryptodesc:	56,	0,	0,	0,	0
md3:	512,	0,	18,	6,	18
7497039 cpu context switches					
5325569 device interrupts					
4299293 software interrupts					
0 traps					
7483223 system calls					
63 kernel threads created					
1896 fork() calls					

```

20 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
27971 vnode pager pageins
30458 vnode pager pages paged in
551 vnode pager pageouts
5527 vnode pager pages paged out
0 page daemon wakeups
0 pages examined by the page daemon
25370 pages reactivated
173201 copy-on-write faults
36 copy-on-write optimized faults
135659 zero fill pages zeroed
127984 zero fill pages prezeroed
224 intransit blocking page faults
462029 total VM faults taken
0 pages affected by kernel thread creation
780640 pages affected by fork()
4850 pages affected by vfork()
0 pages affected by rfork()
401993 pages freed
0 pages freed by daemon
201585 pages freed by exiting process
71208 pages active
35957 pages inactive
100195 pages in VM cache
399107 pages wired down
411743 pages free
4096 bytes per page
0 swap pages used
0 peak swap pages used
310371 total name lookups
    cache hits (86% pos + 10% neg) system 0% per-directory
    deletions 0%, falsehits 0%, toolong 0%
interrupt                total    rate
clock                    3651206    3990
uart                     67064      73
IPI                      819301     895
Totalodesc:              4537571    4959
vm.kmem_map_free: 391446528

```

show task

Syntax	<pre>show task <logical-system (all <i>logical-system-name</i>)> <task-name> io logical-system-mux memory replication snooping summary</pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display routing protocol tasks on the Routing Engine.
Options	<p>none—Display all routing protocol tasks on the Routing Engine.</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> <p>logical-system-mux— Display the logical router multiplexer process (lrmuxd) per-task information.</p> <p>task-name—(Optional) Display information about running tasks for all tasks whose name begins with this string (for example, BGP_Group_69_153 and BGP_Group_70_153 are both displayed when you run the show task BGP_Group command).</p> <p>io— Show i/o statistics for all tasks displayed.</p> <p>memory— Show memory statistics for all tasks displayed.</p> <p>replication— Show only replication tasks.</p> <p>snooping— Show only snooping tasks.</p> <p>summary— (Optional) Display summary information about running tasks.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show task io on page 393• <i>show task logical-system-mux</i>• show task memory on page 395
List of Sample Output	show task on page 391
Output Fields	Table 14 on page 391 describes the output fields for the show task command. Output fields are listed in the approximate order in which they appear.

Table 14: 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.

Sample Output

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>
40 KRT IO task                            {krtio-th}
40 krtio-th                              {krtio-th}
60 krt solic client                        255   85 <ReadDisableWriteDisable>
{krtio-th}
13 rsvp-iobagent./var/run/sub_rpd.sock     46 <WriteDisable> {rsvp-io}
80 jtrace_jthr_task                       255   85 {TraceThread}

```


show task io

List of Syntax [Syntax on page 393](#)
[Syntax \(EX Series Switches\) on page 393](#)

Syntax show task io
 <logical-system (all | *logical-system-name*)>

Syntax (EX Series Switches) show task io

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Display I/O statistics for routing protocol tasks on the Routing Engine.

Options **none**—Display I/O statistics for routing protocol tasks on the Routing Engine.
logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level view

List of Sample Output [show task io on page 394](#)

Output Fields [Table 15 on page 393](#) describes the output fields for the **show task io** command. Output fields are listed in the approximate order in which they appear.

Table 15: 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.

Sample Output

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           0      0       295     0      0
KRT                   0      0        0      0      0
Redirect              0      0        0      0      0
KRT IO task           0      0        0      0      0
  {krtio-th}
krtio-th              0      0        0      0      0
  {krtio-th}
krt solic client      0      1        0      0      0
  {krtio-th}
rsvp-io               83826   0    117827  139682   0
  {rsvp-io}
jtrace_jthr_task      0      0        0      0      0
  {TraceThread}

...

```

show task memory

List of Syntax [Syntax on page 395](#)
[Syntax \(EX Series Switches\) on page 395](#)

Syntax show task memory
 <brief | detail | history | summary>
 <logical-system (all | *logical-system-name*)>

Syntax (EX Series Switches) show task memory
 <brief | detail | history | summary>

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Display memory utilization for routing protocol tasks on the Routing Engine.



NOTE: The show task memory command does not display all the memory used by the routing protocol process. This value does not account for the memory used for the TEXT and STACK segments, or the memory used by the routing protocol process's internal memory manager.

Options **none**—Display standard information about memory utilization for routing protocol tasks on the Routing Engine on all logical systems.

brief | detail | history | summary—(Optional) Display the specified level of output. Use the **history** option to display a history of memory utilization information.

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

Required Privilege Level view

List of Sample Output [show task memory on page 397](#)
[show task memory detail on page 397](#)

Output Fields [Table 16 on page 395](#) describes the output fields for the **show task memory** command. Output fields are listed in the approximate order in which they appear.

Table 16: show task memory Output Fields

Field Name	Field Description	Level of Output
Memory Currently In Use	Memory currently in use. Dynamically allocated memory plus the DATA segment memory in kilobytes.	All levels

Table 16: show task memory Output Fields (continued)

Field Name	Field Description	Level of Output
Memory Maximum Ever Used	Maximum memory ever used.	none specified, brief , history
Memory Available	Memory currently available. NOTE: The maximum currently available memory is displayed incorrectly. On 32-bit Junos OS, the actual available memory is 2,097,152 kilobytes (2147483648 / 1048) but instead it is displayed as 2,147,484 kilobytes (2147483648 / 1000). On 64-bit Junos OS, the actual available memory is 3,145,728 kilobytes (3221225472 / 1048) but instead it is displayed as 3221225 kilobytes (3221225472 / 1000).	none specified, brief
Size (kB)	Memory capacity in 1000-byte kilobytes.	none specified, brief , history , summary
Percentage	Percentage of memory currently available.	none specified, brief
When	Timestamp.	none specified, brief , history
Overall Memory Report	Memory utilization by memory size: <ul style="list-style-type: none"> • Size—Block size, in bytes. • TXP—T indicates transient memory, X indicates exclusive 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. • DTXP—D indicates debug, T indicates transient memory, X indicates exclusive memory, 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

Table 16: show task memory Output Fields (continued)

Field Name	Field Description	Level of Output
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

Sample Output

show task memory

```

user@host> show task memory
Memory                Size (kB)  Percentage  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 detail

```

user@host> show task memory 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 MaxAlloc  MaxAlloc
                   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 OS Release 8.5.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 13.2X51-D20 for QFX Series switches.
 Support for logical systems introduced in Junos OS Release 13.3

Description Displays 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.



CAUTION: If BGP is configured, before attempting nonstop active routing switchover, check the output of `show bgp replication` to confirm that BGP routing table synchronization has completed on the backup Routing Engine. The complete status in the output of `show task replication` only indicates that the socket replication has completed and the BGP synchronization is in progress.

To determine whether BGP synchronization is complete, you must check the **Protocol state** and **Synchronization state** fields in the output of `show bgp replication` on the master Routing Engine. The **Protocol state** must be **idle** and the **Synchronization state** must be **complete**. If you perform NSR switchover before the BGP synchronization has completed, the BGP session might flap.

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 400](#)
[show task replication \(Issued on the Backup Routing Engine\) on page 400](#)

Output Fields [Table 17 on page 399](#) lists the output fields for the `show task replication` command. Output fields are listed in the approximate order in which they appear.

Table 17: 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 .

Table 17: show task replication Output Fields (continued)

Field Name	Field Description
RE mode	Displays the Routing Engine on which the command is issued: Master , Backup , or Not applicable (when the router has only one Routing Engine).
Protocol	Protocols that are supported by nonstop active routing.
Synchronization Status	Nonstop active routing synchronization status for the supported protocols. States are NotStarted , InProgress , and Complete .

Sample Output

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
PIM               Complete
```

show task replication (Issued on the Backup Routing Engine)

```
user@host> show task replication
Stateful Replication: Enabled
RE mode: Backup
```


show version

List of Syntax	Syntax on page 401 Syntax (EX Series Switches) on page 401 Syntax (TX Matrix Router) on page 401 Syntax (TX Matrix Plus Router) on page 401 Syntax (MX Series Router) on page 401 Syntax (QFX Series) on page 401 Syntax (ACX5048 and ACX5096 Routers) on page 401
Syntax	<pre>show version <brief detail></pre>
Syntax (EX Series Switches)	<pre>show version <all-members> <brief detail> <local> <member <i>member-id</i>></pre>
Syntax (TX Matrix Router)	<pre>show version <brief detail> <all-chassis all-lcc lcc <i>number</i> scc></pre>
Syntax (TX Matrix Plus Router)	<pre>show version <all-chassis all-lcc lcc <i>number</i> sfc <i>number</i>> <brief detail></pre>
Syntax (MX Series Router)	<pre>show version <brief detail> <all-members> <local> <member <i>member-id</i>></pre>
Syntax (QFX Series)	<pre>show version <brief detail> <component <i>component-name</i> all></pre>
Syntax (ACX5048 and ACX5096 Routers)	<pre>show version <brief detail></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.</p>

Description Display the hostname and version information about the software running on the router or switch.

Beginning in Junos OS Release 13.3, the **show version** command output includes the **Junos** field that displays the Junos OS version running on the device. This field provides a consistent means of identifying the Junos OS version, rather than extracting that information from the list of installed sub-packages.

Options **none**—Display standard information about the hostname and version of the software running on the router or switch.

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

all-members—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on all members of the Virtual Chassis configuration.

component all—(QFabric systems only) (Optional) Display the host name and version information about the software running on all the components on the QFabric system.

component *component-name*—(QFabric systems only) (Optional) Display the host name and version information about the software running on a specific QFabric system component. Replace *component-name* with the name of the QFabric system component. The *component-name* can be the name of a diagnostics Routing Engine, Director group, fabric control Routing Engine, fabric manager Routing Engine, Interconnect device, or Node group.

local—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix router (or switch-card chassis).

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the host name and version information about the software running on for a specified T640 router (line-card chassis or LCC) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the host name and version information about the software running for a specified T1600 or T4000 router (LCC) that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

sfc *number*—(TX Matrix Plus routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

Additional Information By default, when you issue the **show version** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on a TX Matrix router) or T1600 or T4000 (in a routing matrix based on a TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on a TX Matrix router) or T1600 or T4000 (in a routing matrix based on a TX Matrix Plus router) backup Routing Engines that are connected to it.

Required Privilege Level view

List of Sample Output [show version \(Devices Running Junos OS Release 13.3 and Later\) on page 404](#)
[show version on page 404](#)
[show version \(TX Matrix Plus Router\) on page 405](#)
[show version \(TX Matrix Plus Router with 3D SIBs\) on page 407](#)
[show version \(MX Series Router\) on page 411](#)
[show version \(QFX3500 Switch\) on page 411](#)
[show version \(QFabric System\) on page 411](#)
[show version component all \(QFabric System\) on page 412](#)
[show version \(ACX5048 Router\) on page 413](#)
[show version \(ACX5096 Router\) on page 414](#)

Sample Output

show version (Devices Running Junos OS Release 13.3 and Later)

The following output is from the MX240 Router and shows the **Junos** field introduced in Junos OS 13.3. Depending on the platform running Junos OS 13.3, you might see different installed sub-packages, but the **Junos** field is common across all platforms that run Junos OS 13.3 and later.

```
user@host > show version
Hostname: lab
Model: mx240
Junos: 13.3R1.4
JUNOS Base OS boot [13.3R1.4]
JUNOS Base OS Software Suite [13.3R1.4]
JUNOS Kernel Software Suite [13.3R1.4]
JUNOS Crypto Software Suite [13.3R1.4]
JUNOS Packet Forwarding Engine Support (M/T/EX Common) [13.3R1.4]
JUNOS Packet Forwarding Engine Support (MX Common) [13.3R1.4]
JUNOS Online Documentation [13.3R1.4]
JUNOS Services AACL Container package [13.3R1.4]
JUNOS Services Application Level Gateways [13.3R1.4]
JUNOS AppId Services [13.3R1.4]
JUNOS Border Gateway Function package [13.3R1.4]
JUNOS Services Captive Portal and Content Delivery Container package [13.3R1.4]
JUNOS Services HTTP Content Management package [13.3R1.4]
JUNOS IDP Services [13.3R1.4]
JUNOS Services Jflow Container package [13.3R1.4]
JUNOS Services LL-PDF Container package [13.3R1.4]
JUNOS Services MobileNext Software package [13.3R1.4]
JUNOS Services Mobile Subscriber Service Container package [13.3R1.4]
JUNOS Services NAT [13.3R1.4]
JUNOS Services PTSP Container package [13.3R1.4]
JUNOS Services RPM [13.3R1.4]
JUNOS Services Stateful Firewall [13.3R1.4]
JUNOS Voice Services Container package [13.3R1.4]
JUNOS Services Crypto [13.3R1.4]
JUNOS Services SSL [13.3R1.4]
JUNOS Services IPSec [13.3R1.4]
JUNOS platform Software Suite [13.3R1.4]
JUNOS Runtime Software Suite [13.3R1.4]
JUNOS Routing Software Suite [13.3R1.4]
JUNOS py-base-i386 [13.3R1.4]
```

show version

```
user@host> show version
Hostname: router1
Model: m20
JUNOS Base OS boot [7.2-20050312.0]
JUNOS Base OS Software Suite [7.2-20050312.0]
JUNOS Kernel Software Suite [7.2R1.7]
JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]
JUNOS Routing Software Suite [7.2R1.7]
JUNOS Online Documentation [7.2R1.7]
JUNOS Crypto Software Suite [7.2R1.7]
```

```
{master}
```

```

user@host> show version psd 1
psd1-re0:
-----
Hostname: china
Model: t640
JUNOS Base OS boot [9.1I20080311_1959_builder]
JUNOS Base OS Software Suite [9.1-20080321.0]
JUNOS Kernel Software Suite [9.1-20080321.0]
JUNOS Crypto Software Suite [9.1-20080321.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [9.1-20080321.0]
JUNOS Packet Forwarding Engine Support (T-series) [9.1-20080321.0]
JUNOS Online Documentation [9.1-20080321.0]
JUNOS Routing Software Suite [9.1-20080321.0]
labpkg [7.0]

```

show version (TX Matrix Plus Router)

```

user@host> show version
sfc0-re0:
-----
Hostname: host
Model: txp
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

lcc0-re0:
-----
Hostname: host1
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]

```

```
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]
```

```
lcc1-re0:
```

```
-----
Hostname: host2
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]
```

```
lcc2-re0:
```

```
-----
Hostname: host3
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
```

```

JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

```

```
lcc3-re0:
```

```

-----
Hostname: host4
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

```

show version (TX Matrix Plus Router with 3D SIBs)

```

user@host>show version
sfc0-re0:

```

```
Hostname: sfc0
Model: txp
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]
```

```
lcc0-re0:
```

```
-----
Hostname: lcc0
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
```



```

JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

```

```
lcc2-re0:
```

```

-----
Hostname: lcc2
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

```

```
lcc4-re0:
```

```

-----
Hostname: lcc4
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]

```

JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

lcc6-re0:

Hostname: lcc6
Model: t1600
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services ACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package [13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

lcc7-re0:

Hostname: lcc7
Model: t1600
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]

```

JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services ACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppID Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

```

show version (MX Series Router)

```

user@host5> show version
Hostname: host5
Model: mx80
JUNOS Base OS boot [11.3-20110717.0]
JUNOS Base OS Software Suite [11.3-20110717.0]
JUNOS Kernel Software Suite [11.3-20110717.0]
JUNOS Crypto Software Suite [11.3-20110717.0]
JUNOS Packet Forwarding Engine Support (MX80) [11.3-20110717.0]
JUNOS Online Documentation [11.3-20110717.0]
JUNOS Routing Software Suite [11.3-20110717.0]

```

show version (QFX3500 Switch)

```

user@switch> show version
Hostname: switch
Model: qfx_s3500
JUNOS Base OS boot [11.1R1]
JUNOS Base OS Software Suite [11.1R1]
JUNOS Kernel Software Suite [11.1R1]
JUNOS Crypto Software Suite [11.1R1]
JUNOS Online Documentation [11.1R1]
JUNOS Enterprise Software Suite [11.1R1]
JUNOS Packet Forwarding Engine Support (QFX) [11.1R1]
JUNOS Routing Software Suite [11.1R1]

```

show version (QFabric System)

```

user@qfabric> show version
Hostname: qfabric
Model: qfx3000-g

```

```
Serial Number: qfsn-0123456789
QFabric System ID: f158527a-f99e-11e0-9fbd-00e081c57cda
JUNOS Base Version [12.2I20111018_0215_dc-builder]
```

show version component all (QFabric System)

```
user@switch> show version component all
dg1:
-
Hostname: qfabric
Model: qfx3100
JUNOS Base Version [11.3R1.6]

dg0:
-
Hostname: qfabric
Model: qfx3100
JUNOS Base Version [11.3R1.6]

NW-NG-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FC-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FC-1:
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

DRE-0:
-
Hostname: dre-0
Model: qfx-jvre
```

```

JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

```

```
FM-0:
```

```

-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

```

```
nodedevice1:
```

```

-
Hostname: qfabric
Model: QFX3500
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

```

```
interconnectdevice1:
```

```

-
Hostname: qfabric
Model: QFX3108
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]
warning: from interconnectdevice0: Disconnected

```

show version (ACX5048 Router)

```

user@host> show version
fpc0:
Hostname: acx5k11-ac
Model: acx5048
Junos: 15.1X54-D20.3
JUNOS Base OS boot [15.1X54-D20.3]
JUNOS Online Documentation [15.1X54-D20.3]
JUNOS Crypto Software Suite [15.1X54-D20.3]
JUNOS Base OS Software Suite [15.1X54-D20.3]
JUNOS Kernel Software Suite [15.1X54-D20.3]


```

```
JUNOS Packet Forwarding Engine Support (acx5k) [15.1X54-D20.3]
JUNOS Enterprise Software Suite [15.1X54-D20.3]
JUNOS Routing Software Suite [15.1X54-D20.3]
JUNOS py-base-i386 [15.1X54-D20.3]
JUNOS Host Software [15.1X54-D20.3]
```

show version (ACX5096 Router)

```
user@host> show version
fpc0:
Hostname: acx5k13-ac
Model: acx5096
Junos: 15.1X54-D20.3
JUNOS Base OS boot [15.1X54-D20.3]
JUNOS Online Documentation [15.1X54-D20.3]
JUNOS Crypto Software Suite [15.1X54-D20.3]
JUNOS Base OS Software Suite [15.1X54-D20.3]
JUNOS Kernel Software Suite [15.1X54-D20.3]
JUNOS Packet Forwarding Engine Support (acx5k) [15.1X54-D20.3]
JUNOS Enterprise Software Suite [15.1X54-D20.3]
JUNOS Routing Software Suite [15.1X54-D20.3]
JUNOS py-base-i386 [15.1X54-D20.3]
JUNOS Host Software [15.1X54-D20.3]
```

start shell

Syntax	start shell (csh sh) <user <i>username</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Exit from the CLI environment and create a UNIX-level shell. To return to the CLI, type exit from the shell.
<div>  NOTE: <ul style="list-style-type: none"> To issue this command, the user must have the required login access privileges configured by including the permissions statement at the [edit system login class <i>class-name</i>] hierarchy level. UNIX wheel group membership or permissions are no longer required to issue this command. </div>	
Options	csh —Create a UNIX C shell. sh —Create a UNIX Bourne shell. user <i>username</i> —(Optional) Start the shell as another user.
Additional Information	When you are in the shell, the shell prompt has the following format: <code><i>username@hostname</i>%</code> An example of the prompt is: <code>root@host%</code>
Required Privilege Level	shell and maintenance
List of Sample Output	start shell csh on page 416
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

start shell csh

```
user@host> start shell csh
%

exit
%

username@hostname% start shell sh
%

exit
user@host>
```


test configuration

Syntax	<code>test configuration <i>filename</i></code> <code>syntax-only</code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>syntax-only option introduced in Junos OS Release 12.1.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>
Description	Verify that the syntax of a configuration file is correct. If the configuration contains any syntax or commit check errors, a message is displayed to indicate the line number and column number in which the error was found. This command only accepts text files.
Options	<p><i>filename</i>—Name of the configuration file.</p> <p>syntax-only—(Optional) Check the syntax of a partial configuration file, without checking for commit errors.</p>
Required Privilege Level	view
List of Sample Output	test configuration on page 417
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

test configuration

```

user@host> test configuration terminal
[Type ^D to end input]
system {
host-name host;
test1;
login;
}
terminal:3:(8) syntax error: test
[edit system]
'test;'
syntax error
terminal:4:(11) statement must contain additional statements: ;
[edit system login]
'login ;'
statement must contain additional statements
configuration syntax failed

```

