

Junos[®] OS

Overview for Junos OS

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Junos[®] OS Overview for Junos OS

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Use this guide to get familiar with the various functions of Junos OS devices, and learn how to configure, monitor, and manage them.

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>.

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 xii](#) 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 xii 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>

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

Convention	Description	Examples
<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.	
GUI Conventions		

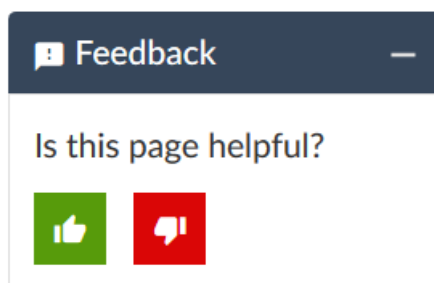
Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
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 .

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We encourage you to provide feedback so that we can improve our documentation. You can use either of the following methods:

- Online feedback system—Click TechLibrary Feedback, on the lower right of any page on the [Juniper Networks TechLibrary](#) site, and do one of the following:



- Click the thumbs-up icon if the information on the page was helpful to you.
- Click the thumbs-down icon if the information on the page was not helpful to you or if you have suggestions for improvement, and use the pop-up form to provide 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 Juniper Care or Partner Support Services 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/>.
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- 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/>
- Create a service request online: <https://myjuniper.juniper.net>

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

Creating a Service Request with JTAC

You can create a service request with JTAC on the Web or by telephone.

- Visit <https://myjuniper.juniper.net>.
- 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://support.juniper.net/support/requesting-support/>.

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Junos OS Software Overview

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About the Overview for Junos OS and Junos OS Documentation

The Overview for Junos OS is intended to provide a technical and detailed exploration of Junos OS, explaining both concepts and operational principles, as well as how to use Junos OS to configure and use Juniper Networks devices.

In this guide, we cover the following:

- Understanding Junos OS
- Security management
- Device configuration
- Device monitoring

- Managing network devices
- Using configuration statements and operational commands

For a more basic introduction to Junos OS, see the *Getting Started Guide*. It provides a high-level description of Junos OS, describes how to access devices, and provides simple step-by-step instructions for initial device configuration.

To learn how to use the Junos OS command-line interface (CLI) and understand even more advanced Junos OS topics, see the *CLI User Guide*. This guide explains how to use the CLI, configuration statements, managing configurations, and operational commands for monitoring Junos OS network devices.

RELATED DOCUMENTATION

CLI User Guide

Getting Started Guide

Junos OS Overview

Juniper Networks provides high-performance network routers that create a responsive and trusted environment for accelerating the deployment of services and applications over a single network. The Junos operating system (Junos OS) is the foundation of these high-performance networks. Unlike other complex, monolithic software architectures, Junos OS incorporates key design and developmental differences to deliver increased network availability, operational efficiency, and flexibility. These key advantages are:

- One operating system
- One software release
- One modular software architecture

One Operating System

Unlike other network operating systems that share a common name but splinter into many different programs, Junos OS is a single, cohesive operating system that is shared across all devices and product lines. This enables Juniper Networks engineers to develop software features once and share the features across product lines simultaneously. Because features are common to a single source, generally these features are implemented the same way for all of the product lines, reducing the training required to learn different tools and methods for each product. Furthermore, because all Juniper Networks products use the same code base, interoperability among products is not an issue.

One Software Release

Each new version of Junos OS is released concurrently for all product lines following a preset schedule. Each new version of software includes working features released in previous versions of the software and must achieve zero critical regression errors. This discipline ensures reliable operations for the entire release.

One Modular Software

Although individual architecture modules of Junos OS communicate through well-defined interfaces, each module runs in its own protected memory space, preventing one module from disrupting another. It also enables the independent restart of each module as necessary. This is in contrast to monolithic operating systems for which a malfunction in one module can ripple to other modules, possibly causing a full system crash or restart. This modular Junos OS architecture provides a high level of performance, high availability, security, and device scalability not found in other operating systems.

Junos OS is preinstalled on your Juniper Networks device when you receive it from the factory. When you first power on the device, all software starts automatically. You then configure the software so that the device can participate in your network.

You can upgrade the device software as new features are added or software problems are fixed. You obtain new software by downloading images from the Juniper Networks Support Web page onto your device or another system on your local network, then install the software upgrade on the device.

Juniper Networks devices run only binaries supplied by Juniper Networks. Each Junos OS image includes a digitally signed manifest of executables, which are registered with the system only if the signature can be validated. Junos OS will not execute any binary without a registered fingerprint. This feature protects the system against unauthorized software and activity that might compromise the integrity of your network devices.

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Junos OS Architecture Overview

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This topic provides an overview of the Junos OS product and routing process architecture:

Product Architecture

Junos OS provides IP routing software as well as software for interface, network, and chassis management. Junos OS runs on all Juniper Networks J Series, M Series, MX Series, and T Series routers, as well as on other Juniper Networks products.

- J Series Services Routers are deployed at the remote edge of distributed networks.
- M Series Multiservice Edge routers are mostly deployed in small and medium cores in peering, route reflector, data center applications, or at the IP or MPLS edge to support high-performance Layer 2 and Layer 3 services. All M Series routers have redundant power and cooling, and the M10i, M20, M40e, M120, M160, and M320 routers have fully redundant hardware, including Routing Engines, switch interface components, and packet forwarding components. The M120 router also supports Forwarding Engine Board (FEB) failover. In the event of a FEB failure, a backup FEB can quickly take over packet forwarding.
- MX Series 5G Universal Routing Platforms are Ethernet-optimized edge routers that provide both switching and carrier-class Ethernet routing. The MX Series routers support Dense Port Concentrators (DPCs), Modular Port Concentrator (MPCs) and Modular Interface Cards, and FPCs and PICs. For a detailed list of supported line cards see the [MX Series Interface Module Reference](#).
- T Series Core routers (T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers) are deployed at the core of provider networks. These routers have fully redundant hardware, including power and cooling, Routing Engines, and Switch Interface Boards (SIBs).

A *routing matrix* is a multichassis architecture composed of multiple routers, for example, one TX Matrix router connected to one to four T640 routers, or one TX Matrix Plus router connected to one to four T1600 routers. From the perspective of the user interface, the routing matrix appears as a single router. On a routing matrix composed of a TX Matrix router and T640 routers, the TX Matrix router controls all of the T640 routers. On a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, the TX Matrix Plus router controls all the T1600 or T4000 routers.

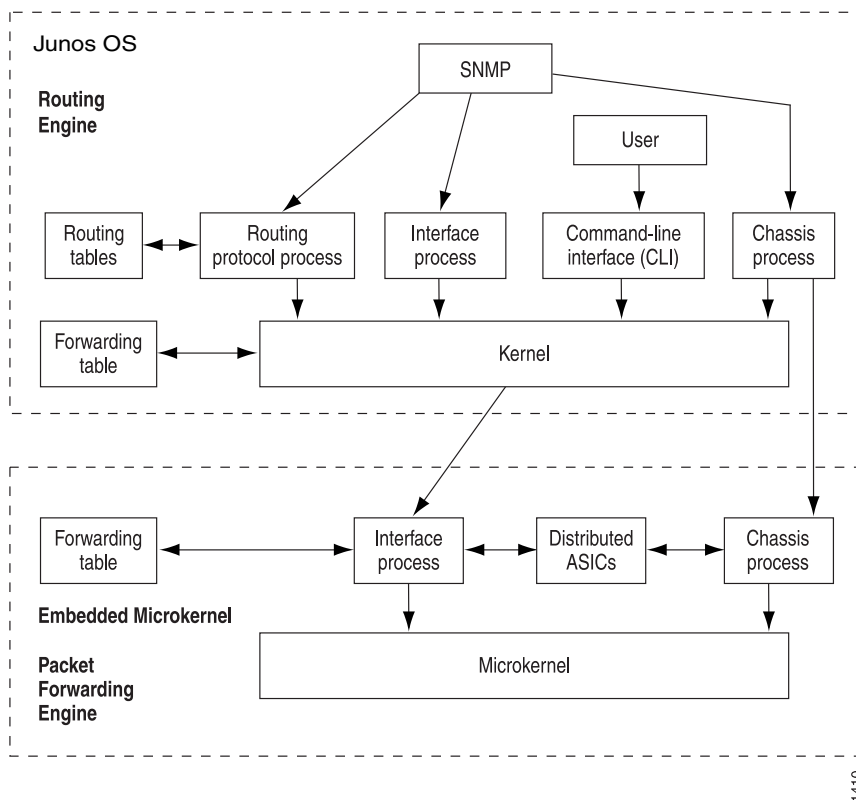
Routing Process Architecture

The routing process is handled by the following two components (see [Figure 1 on page 7](#)):

- Routing Engine
- Packet Forwarding Engine

Because this architecture separates control operations such as routing updates and system management from packet forwarding, the router can deliver superior performance and highly reliable Internet operation.

Figure 1: Product Architecture



Packet Forwarding Engine

The Packet Forwarding Engine uses application-specific integrated circuits (ASICs) to perform Layer 2 and Layer 3 packet switching, route lookups, and packet forwarding. The Packet Forwarding Engine forwards packets between input and output interfaces. The M Series routers (except the M7i, M40, and M320) have redundant Packet Forwarding Engines. The J Series Routers have a software-based Packet Forwarding Engine.

Routing Engine

The Routing Engine controls the routing updates and the system management. The Routing Engine consists of routing protocol software processes running inside a protected memory environment on a general-purpose computer platform. The Routing Engine handles all of the routing protocol processes and

other software processes that control the routers' interfaces, some of the chassis components, system management, and user access to the router. These routers and software processes run on top of a kernel that interacts with the Packet Forwarding Engine. All M Series (except the M7i and M40) routers and T Series routers have redundant Routing Engines.

The Routing Engine has these features:

- Routing protocol packets processing—All routing protocol packets from the network are directed to the Routing Engine, and therefore do not unnecessarily delay the Packet Forwarding Engine.
- Software modularity—Software functions are in separate processes, so a failure of one process has little or no effect on other software processes.
- In-depth IP functionality—Each routing protocol is implemented with a complete set of IP features and provides full flexibility for advertising, filtering, and modifying routes. Routing policies are set according to route parameters, such as prefix, prefix lengths, and Border Gateway Protocol (BGP) attributes.
- Scalability—Junos OS routing tables are designed to hold all the routes used in current and near-future networks. Additionally, Junos OS can efficiently support large numbers of interfaces and virtual circuits.
- Management interfaces—System management is implemented with a command-line interface (CLI), a craft interface, and Simple Network Management Protocol (SNMP).
- Storage and change management—Configuration files, system images, and microcode are held and maintained in one primary and two secondary storage systems, permitting local or remote upgrades.
- Monitoring efficiency and flexibility—Alarms are generated and packets are counted without adversely affecting packet forwarding performance.

The Routing Engine constructs and maintains one or more routing tables. From the routing tables, the Routing Engine derives a table of active routes, called the *forwarding table*, which is then copied into the Packet Forwarding Engine. The forwarding table in the Packet Forwarding Engine can be updated without interrupting the router's forwarding.

In a Junos-FIPS environment, hardware configurations with two Routing Engines must use IPsec and a private routing instance for all communications between the Routing Engines. IPsec communication between the Routing Engines and Adaptive Services (AS) II FIPS PICs is also required.

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Router Hardware Components

Junos OS runs on Juniper Networks routers and Packet Transport Routers, including: ACX Series, J Series, M Series, MX Series, T Series, and PTX Series Packet Transport Routers. Each network device consists of the major hardware components as shown in [Table 3 on page 9](#). One or more of the major hardware components shown is used in each system.

NOTE: The ACX Series router is a single-board router with a built-in Routing Engine and one Packet Forwarding Engine. The “pseudo” FPCs and PICs are described in *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*.

Table 3: Major Router Hardware Components

	M Series	MX Series	T Series	PTX Series	J Series
Routing Engines	X	X	X	X	X
Control Board	X		X	X	
Switch Interface Board (SIB)	X		X	X	
Forwarding Engine Board (FEB)	X				
Power Supply	X	X	X	X	X
Cooling System	X	X	X	X	X
Dense Port Concentrators (DPC)		X			
Switch Control Board (SCB)		X			
Flexible PIC Concentrators (FPC)	X	X	X	X	
Physical Interface Module (PIM)					X
Physical Interface Card (PIC)	X	X	X	X	

Flexible PIC Concentrators (FPCs) are each populated by PICs for various interface types. On some routers, the PICs are installed directly in the chassis.

For information about specific components in your router, refer to its hardware guide.

RELATED DOCUMENTATION

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Junos OS Routing Engine Components and Processes

Junos OS runs on the Routing Engine. Junos OS consists of software processes that support Internet routing protocols, control router interfaces and the router chassis, and enable router system management. Junos OS processes run on top of a kernel, which enables communication between processes and provides a direct link to the Packet Forwarding Engine software. Junos OS can be used to configure routing protocols and router interface properties, as well as to monitor and troubleshoot protocol and network connectivity problems.

The Routing Engine software consists of several software processes that control router functionality and a kernel that provides the communication among all the processes.

Routing Engine Kernel

The Routing Engine kernel provides the underlying infrastructure for all Junos OS processes, including providing the link between the routing tables and the Routing Engine's forwarding table. The kernel is also responsible for all communication with the Packet Forwarding Engine, which includes keeping the Packet Forwarding Engine's copy of the forwarding table synchronized with the master copy in the Routing Engine.

Initialization Process

When the device boots, an initialization process (init) starts and monitors all the other software processes.

If a software process terminates or fails to start when called, the init process attempts to restart it a limited number of times and logs any failure information for further investigation.

Management Process

The management process (mgd) manages the configuration of the router and all user commands. The management process is responsible for notifying other processes when a new configuration is committed. A dedicated management process handles Junos XML protocol XML requests from its client, which might be the CLI or any Junos XML protocol client.

Process Limits

There are limits to the total number of Junos OS processes that can run simultaneously on a device. There are also limits set for the maximum number of iterations of any single process. The limit for iterations of any single process can only be reached if the limit of overall system processes is not exceeded.

Access methods such as telnet and SSH spawn multiple system processes for each session created. For this reason, it might not be possible to simultaneously support the maximum number of access sessions for multiple services.

Routing Protocol Process

Within Junos OS, the routing protocol process (rpd) controls the routing protocols that run on the device. The rpd process starts all configured routing protocols and handles all routing messages. It maintains one or more routing tables, which consolidate the routing information learned from all routing protocols. From this routing information, the routing protocol process determines the active routes to network destinations and installs these routes into the Routing Engine's forwarding table. Finally, rpd implements routing policy, which enables you to control the routing information that is transferred between the routing protocols and the routing table. Using routing policy, you can filter and limit the transfer of information as well as set properties associated with specific routes.

Interface Process

The Junos OS interface process enables you to configure and control the physical interface devices and logical interfaces present in a network device. You can configure interface properties such as the interface location, for example, in which slot the Flexible PIC Concentrator (FPC) is installed and in which location on the FPC the Physical Interface Card (PIC) is installed, as well as the interface encapsulation and interface-specific properties. You can configure the interfaces currently present in the device, as well as interfaces that are not present but that you might add later.

The Junos OS interface process communicates through the Junos OS kernel with the interface process in the Packet Forwarding Engine, enabling Junos OS to track the status and condition of the network device's interfaces.

Chassis Process

The Junos OS chassis process (chassisd) enables you to configure and control the properties of the device, including conditions that trigger alarms. The chassisd on the Routing Engine communicates directly with its peer processes running on the Packet Forwarding Engine.

SNMP and MIB II Processes

Junos OS supports the Simple Network Management Protocol (SNMP), which helps administrators monitor the state of a device. The software supports SNMP version 1 (SNMPv1), version 2 (SNMPv2, also known as version 2c, or v2c), and version 3 (SNMPv3). The Junos OS implementation of SNMP does not include any of the security features that were originally included in the IETF SNMP drafts but were later dropped. The SNMP software is controlled by the Junos OS SNMP and Management Information Base II (MIB II) processes, which consist of an SNMP master agent and various subagents.

RELATED DOCUMENTATION

[Junos OS Architecture Overview](#) | 6

List of Junos OS Processes

Junos OS consists of multiple processes that run on different platforms and have unique functions. The separation of functions provides operational stability, because each process accesses its own protected memory space.

[Table 4 on page 12](#) describes the processes that run only on MX Series 5G Universal Routing Platforms.

Table 4: Junos OS Processes on MX Series Platform Only

Process	Name	Description
Clksync process (RE)	clksyncd	<p>Defines the operation of synchronous Ethernet and Precision Time Protocol (PTP) on a Juniper Networks MX Series router. The operation includes communication with the Packet Forwarding Engine (clock-sync module) to program and process clock events from the EEC clock.</p> <p>Operates the PTP stack, exchanges packets, and handles the configuration changes for the modular MX Series (MX80).</p> <p>Controls the configuration and monitoring of the overall operation of the PTP functionality for chassis-based MX Series platforms (MX240, MX480, and so on).</p>

Table 4: Junos OS Processes on MX Series Platform Only (*continued*)

Process	Name	Description
Clock-sync process (PFE)	clock-sync	<p>Programs and monitors the modular interface card (MIC), the CPLD, and the EEC clock. Peer of the clksyncd process module.</p> <p>Captures all PTP and Synchronous Ethernet statistics on the Packet Forwarding Engine and provides them to the Routing Engine.</p>
Interchassis communication process	iccpd	Exchanges proprietary Junos OS messages between two Juniper Networks MX Series routers that take part in a multichassis link aggregation group (LAG).
Statistics agent process	stats-agentd	<p>Acts as a relay process to collect interface statistics for all software development kit (SDK) applications.</p> <p>Interacts with the pfed process to collect the logical interface statistics for SDK applications.</p>

Table 5 on page 13 lists all the other processes that are common across platforms.

Table 5: Junos OS Processes

Process	Name	Description
Adaptive services process	adaptive-services	Manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection service (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.
Alarm control process	alarm-control	Configures the system alarm.
Access Node Control Protocol (ANCP) process	ancpd-service	Works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.
Application identification process	application-identification	Identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.
RADIUS accounting process	audit-process	Gathers statistical data that can be used for general network monitoring, analyzing, and tracking usage patterns, for billing a user based upon the amount of time or type of services accessed.

Table 5: Junos OS Processes (continued)

Process	Name	Description
Auto-configuration process	auto-configuration	Configures interfaces automatically.
Boot process	bootp	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 process	captive-portal-content-delivery	Specifies the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.
Universal Edge Layer 2 Tunneling Protocol process	ce-l2tp-service	(M10, M10i, M7i, and MX Series routers only) Establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.
Ethernet OAM connectivity fault management process	cfm	Monitors the physical link between two switches.
Chassis control process	chassis-control	Manages the chassis.
Class of service process	class-of-service	Controls the network device's CoS configuration.
Ethernet clock synchronization process	clksyncd-service	Uses Synchronous Ethernet (SyncE) for external clock synchronization .
Craft interface I/O control process	craft-control	Controls the I/O of the craft interface.
Database replication process	database-replication	(EX Series switches and MX Series routers only) Manages the replication of updates from the master to the slave in the database management system.
Datapath trace process	datapath-trace-service	Traces the path taken by the packet through the network.

Table 5: Junos OS Processes (continued)

Process	Name	Description
Dynamic Host Configuration Protocol process	dhcp-service	(EX Series switches and MX Series routers only) Enables a DHCP server to allocate network IP addresses and deliver configuration settings to client hosts without user intervention.
Diameter process	diameter-service	Implements the Diameter protocol which uses the Transmission Control Protocol (TCP) and Stream Control Transmission Protocol (SCTP) instead of User Datagram Protocol (UDP), for monitoring the network.
Disk monitoring process	disk-monitoring	Checks the health of the hard drive on the Routing Engine.
Dynamic flow capture (DFC) process	dynamic-flow-capture	Controls the DFC configurations on Monitoring Services III PICs.
ECC parity errors logging process	ecc-error-logging	Logs the ECC parity errors into the memory on the Routing Engine.
Connectivity fault management (CFM) process	ethernet-connectivity-fault-management	Provides IEEE 802.1ag OAM CFM database information for CFM maintenance association end points (MEPs) in a CFM session.
Ethernet OAM Link-Fault-Management process	ethernet-link-fault-management	(EX Series switches and MX Series routers only) Provides the OAM link fault management (LFM) information for Ethernet interfaces.
Event processing process	event-processing or eventd	Configures the application to handle all generated events.
Firewall process	firewall	Manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a device.
General authentication process	general-authentication-service	(EX Series switches and MX Series routers only) Manages general authentication of a user.

Table 5: Junos OS Processes (continued)

Process	Name	Description
Inter-Chassis Communication Protocol (ICCP) process	iccp-service	Synchronizes data within a set of two (or more) PEs that form a redundancy group (RG).
IDP policy process	idp-policy	Enables various attack detection and prevention techniques on traffic traversing the network.
Integrated Local Management Interface process	ilmi	Provides bidirectional exchange of management information between two Asynchronous Transfer Mode (ATM) interfaces across a physical connection.
Inet process	inet-process	Configures the IP multicast family.
Init process	init	Initializes the USB modem.
Interface control process	interface-control	Controls the router's or switch's physical interface devices and logical interfaces.
Kernel replication process	kernel-replication	Replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.
Layer 2 address flooding and learning process	l2-learning	Enables a network device to: <ul style="list-style-type: none"> • Learn unicast media access control (MAC) addresses to avoid flooding the packets to all the ports in a bridge domain. • Create a source MAC entry in its source and destination MAC tables for each MAC address learned from packets received on ports that belong to the bridge domain.
Layer 2 Control Protocol process	l2cpd-service	Enables features such as Layer 2 protocol tunneling and nonstop bridging.

Table 5: Junos OS Processes (continued)

Process	Name	Description
Link Aggregation Control Protocol process	lACP	<p>The process:</p> <ul style="list-style-type: none"> • Provides a standardized means for exchanging information between partner systems on a link. • Allows the link aggregation control instances to reach agreement on the identity of the Link Aggregation Group (LAG) to which the link belongs, and then to move the link to that LAG. • Enables the transmission and reception processes for the link to function in an orderly manner.
Link management process	link-management	Manages traffic engineering links.
Local policy decision function process	local-policy-decision-function	Regulates the collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.
Logical system multiplexer process	logical-system-mux or lrmuxd	Manages multiple instances of the routing protocols process (rpd) on a machine running logical routers.
MAC validation process	mac-validation	Configures MAC address validation that enables a network device to validate if received packets contain a trusted IP source and an Ethernet MAC source address.
Management Information Base II process	mib-process	Provides the device's MIB II agent.
Mobile IP process	mobile-ip	Configures Junos OS Mobile IP features.
NFS mount requests process	mountd-service	(Some EX Series switches and MX Series routers only) Completes internal NFS mount requests for MS-PIC and MS-MPC.
MPLS Periodic Traceroute process	mpls-traceroute	Enables tracing of forwarding equivalence classes (FECs) for LDP Layered Service Providers (LSPs).

Table 5: Junos OS Processes (continued)

Process	Name	Description
Multiservice process	mspd	Configures multiservice edge routers.
Multicast Snooping process	multicast-snooping	(EX Series switches and MX Series routers only) Makes Layer 3 information, such as the MAC addresses of members of a multicast group, known to Layer 2 devices, such as VLAN switches.
DNS server process	named-service	Enables a device to resolve hostnames into addresses.
Bidirectional Forwarding Detection (BFD) process	neighbor-liveness	Displays the process that specifies the maximum length of time that the device waits for its neighbor to re-establish an LDP session.
Remote NFS server process	nfsd-service	Provides remote file access for applications that need NFS-based transport.
Network time process	ntp	Provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network.
Packet-triggered dynamic subscribers and policy control (PTCP) process	packet-triggered-subscribers	Enables the application of policies to dynamic subscribers that are controlled by a subscriber termination device.
Peer selection service process	peer-selection-service	Enables peer selection.
Periodic packet management process	periodic-packet-services	Processes a variety of time-sensitive periodic tasks so that other processes can more optimally direct their resources.
Packet Forwarding Engine process	pfed	Gathers and reports Packet Forwarding Engine statistics.
Packet gateway service process	pgcp-service or pgcpd	Configures the Packet Gateway Control Protocol (PGCP) that is required for the border gateway function (BGF) feature.
Pragmatic General Multicast process	pgm	Enables a reliable transport layer for multicast applications.

Table 5: Junos OS Processes (*continued*)

Process	Name	Description
PIC services logging process	pic-services-logging or fsad (the file system access daemon)	Enables PICs to send special logging information to the Routing Engine for archiving on the hard drive.
Point-to-Point Protocol (PPP) process	ppp	Enables transporting IP traffic across point-to-point links.
Universal edge PPP process	ppp-service	Enables transporting IP traffic across universal edge routers.
Point-to-Point Protocol over Ethernet process	pppoe	Allows users to connect to a network of hosts over a bridge or access concentrator.
Process health monitor process	process-monitor or pmond	<p>Extends the SNMP RMON alarm infrastructure to provide predefined monitoring for a selected set of object instances (such as file system usage, CPU usage, and memory usage) and dynamic object instances (such as Junos OS processes).</p> <p>NOTE: The process health monitor process is enabled by default on the Routing Engines of MX Series routers, even when no service interfaces are configured. To disable this process, include the disable statement at the [edit system processes process-monitor] hierarchy level.</p>
Redundancy interface management process	redundancy-interface-process	Serves as an active or backup process of an application server and can be configured to process traffic for more than one logical application server.
Remote operations process	remote-operations	Provides the ping and traceroute MIBs.
Resource cleanup process	resource-cleanup	Enables cleaning of resources by entities other than the application itself.
Routing process	routing	Directs forwarding on the basis of routing tables, which maintain a record of the routes to various network destinations.

Table 5: Junos OS Processes (continued)

Process	Name	Description
Traffic sampling control process	sampling	Performs packet sampling based on particular input interfaces and various fields in the packet header.
Session Border Control (SBC) configuration process	sbc-configuration-process	Configures the session border controller functionality that enables delivery of voice, video, and other multimedia services with assured quality and security.
SDK service process	sdk-service	Runs on the Routing Engine and enables communication 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 (SND) protocol process	secure-neighbor-discovery or send	(EX Series switches and MX Series routers only) Provides support for protecting NDP messages.
Service Deployment System (SDX) process	service-deployment	Enables Junos OS to work with the Session and Resource Control (SRC) software.
Simple Network Management Protocol (SNMP) process	snmp	Enables the monitoring of network devices from a central location, and provides the device's SNMP master agent.
SONET Automatic Protection Switching (APS) process	sonet-aps	Monitors any SONET interface that participates in APS.
Static subscribers process	static-subscribers	Associates subscribers with statically configured interfaces, and provides dynamic service activation and activation for these subscribers.
Tunnel OAM process	tunnel-oamd	Enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks.
Virtual Router Redundancy Protocol (VRRP) process	vrrp	(EX Series switches and MX Series routers only) 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.

Table 5: Junos OS Processes (continued)

Process	Name	Description
Watchdog timer process	watchdog	Enables the watchdog timer when Junos OS encounters a problem.

Default Directories for Junos OS File Storage on the Network Device

Junos OS files are stored in the following directories on the device:

- **/altconfig**—When you back up the currently running and active file system partitions on the device to standby partitions using the **request system snapshot** command, the **/config** directory is backed up to **/altconfig**. Normally, the **/config** directory is on the CompactFlash card and **/altconfig** is on the hard disk.
- **/altroot**—When you back up the currently running and active file system partitions on the router to standby partitions using the **request system snapshot** command, the root file system (**/**) is backed up to **/altroot**. Normally, the root directory is on the CompactFlash card and **/altroot** is on the hard drive.
- **/config**—This directory is located on the primary boot device, that is, on the permanent storage from which the device booted (generally the CompactFlash card (device **wd0**) or internal flash storage). This directory contains the current operational router or switch configuration and the last three committed configurations, in the files **juniper.conf**, **juniper.conf.1**, **juniper.conf.2**, and **juniper.conf.3**, respectively.
- **/var**—This directory is located either on the hard drive (device **wd2**) or internal flash storage. It contains the following subdirectories:
 - **/home**—Contains users' home directories, which are created when you create user access accounts. For users using SSH authentication, their **.ssh** file, which contains their SSH key, is placed in their home directory. When a user saves or loads a configuration file, that file is loaded from the user's home directory unless the user specifies a full pathname.
 - **/db/config**—Contains up to 46 additional previous versions of committed configurations, which are stored in the files **juniper.conf.4.gz** through **juniper.conf.49.gz**.
 - **/log**—Contains system log and tracing files.
 - **/tmp**—Contains core files. The software saves up to five core files, numbered from 0 through 4. File number 0 is the oldest core file and file number 4 is the newest core file. To preserve the oldest core files, the software overwrites the newest core file, number 4, with any subsequent core file.

Each device ships with removable media (device **wfd0**) that contains a backup copy of Junos OS.

Directories on the Logical System

In addition to saving the configuration of logical systems in the current **juniper.conf** file, each logical system has an individual directory structure created in the **/var/logical-systems/logical-system-name** directory.

The **/var/logical-systems/logical-system-name** directory contains the following subdirectories:

- **/config**—Contains the current operational configuration specific to the logical system.
- **/log**—Contains system log and tracing files specific to the logical system.

To maintain backward compatibility for the log files with previous versions of Junos OS, a symbolic link (symlink) from the **/var/logs/logical-system-name** directory to the **/var/logical-systems/logical-system-name** directory is created when a logical system is configured.

- **/tmp**—Contains temporary files specific to the logical system.

This file system for each logical system enables logical system users to view trace logs and modify logical system files. Logical system administrators have full access to view and modify all files specific to the logical system.

Logical system users and administrators can save and load configuration files at the logical-system hierarchy level using the **save** and **load** configuration mode commands. In addition, they can also issue the **show log**, **monitor**, and **file** operational mode commands at the logical-system hierarchy level.

RELATED DOCUMENTATION

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Junos OS Support for IPv4 Routing Protocols

Junos OS implements full IP routing functionality, providing support for IP version 4 (IPv4). The routing protocols are fully interoperable with existing IP routing protocols, and they have been developed to provide the scale and control necessary for the Internet core.

Junos OS provides the following routing and Multiprotocol Label Switching (MPLS) applications protocols:

- Unicast routing protocols:

- BGP—Border Gateway Protocol version 4 is an exterior gateway protocol (EGP) that guarantees loop-free exchange of routing information between routing domains (also called autonomous systems). BGP, in conjunction with Junos routing policy, provides a system of administrative checks and balances that can be used to implement peering and transit agreements.
- ICMP—Internet Control Message Protocol router discovery enables hosts to discover the addresses of operational routers on the subnet.
- IS-IS—Intermediate System-to-Intermediate System is a link-state interior gateway protocol (IGP) for IP networks that uses the shortest-path-first (SPF) algorithm, which also is referred to as the Dijkstra algorithm, to determine routes. The Junos IS-IS software is a new and complete implementation of the protocol, addressing issues of scale, convergence, and resilience.
- OSPF—Open Shortest Path First version 2 is an IGP that was developed for IP networks by the Internet Engineering Task Force (IETF). OSPF is a link-state protocol that makes routing decisions based on the SPF algorithm. The Junos OSPF software is a new and complete implementation of the protocol, addressing issues of scale, convergence, and resilience.
- RIP—Routing Information Protocol version 2 is a distance-vector IGP for IP networks based on the Bellman-Ford algorithm. RIP dynamically routes packets between a subscriber and a service provider without the subscriber having to configure BGP or participate in the service provider's IGP discovery process.
- Multicast routing protocols:
 - DVMRP—Distance Vector Multicast Routing Protocol is a dense-mode (flood-and-prune) multicast routing protocol.
 - IGMP—Internet Group Management Protocol (versions 1 and 2) is used to manage membership in multicast groups.
 - MSDP—Multicast Source Discovery Protocol enables multiple Protocol Independent Multicast (PIM) sparse mode domains to be joined. A rendezvous point (RP) in a PIM sparse mode domain has a peer relationship with an RP in another domain, enabling it to discover multicast sources from other domains.
 - PIM sparse mode and dense mode—Protocol-Independent Multicast is a multicast routing protocol. PIM sparse mode routes to multicast groups that might span wide-area and interdomain internets. PIM dense mode is a flood-and-prune protocol.
 - SAP/SDP—Session Announcement Protocol and Session Description Protocol handle conference session announcements.
- MPLS applications protocols:
 - LDP—The Label Distribution Protocol provides a mechanism for distributing labels in non-traffic-engineered applications. LDP enables routers to establish label-switched paths (LSPs) through a network by mapping network layer routing information directly to data-link layer switched paths. LSPs created by LDP can also traverse LSPs created by the Resource Reservation Protocol (RSVP).

- MPLS—Multiprotocol Label Switching, formerly known as tag switching, enables you to manually or dynamically configure LSPs through a network. It lets you direct traffic through particular paths rather than rely on the IGP's least-cost algorithm to choose a path.
- RSVP—The Resource Reservation Protocol version 1 provides a mechanism for engineering network traffic patterns that is independent of the shortest path decided upon by a routing protocol. RSVP itself is not a routing protocol; it operates with current and future unicast and multicast routing protocols. The primary purpose of the Junos RSVP software is to support dynamic signaling for MPLS LSPs.

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Junos OS Support for IPv6 Routing Protocols

The Junos OS implements IP routing functionality, providing support for IP version 6 (IPv6). The routing protocols have been developed to provide the scale and control necessary for the Internet core.

The software supports the following unicast routing protocols:

- BGP—Border Gateway Protocol version 4 is an EGP that guarantees loop-free exchange of routing information between routing domains (also called autonomous systems). BGP, in conjunction with Junos routing policies, provides a system of administrative checks and balances that can be used to implement peering and transit agreements.
- ICMP—Internet Control Message Protocol router discovery enables hosts to discover the addresses of operational routers on the subnet.
- IS-IS—Intermediate System-to-Intermediate System is a link-state IGP for IP networks that uses the SPF algorithm, which also is referred to as the Dijkstra algorithm, to determine routes. The Junos OS supports a new and complete implementation of the protocol, addressing issues of scale, convergence, and resilience.
- OSPF version 3 (OSPFv3) supports IPv6. The fundamental mechanisms of OSPF such as flooding, designated router (DR) election, area-based topologies, and the SPF calculations remain unchanged. Some differences exist either because of changes in protocol semantics between IPv4 and IPv6, or because of the need to handle the increased address size of IPv6.
- RIP—Routing Information Protocol version 2 is a distance-vector IGP for IP networks based on the Bellman-Ford algorithm. RIP dynamically routes packets between a subscriber and a service provider

without the subscriber having to configure BGP or to participate in the service provider's IGP discovery process.

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Junos OS Routing and Forwarding Tables

A major function of the Junos OS routing protocol process is to maintain the Routing Engine's routing tables and use these tables to determine the active routes to network destinations. The routing protocol process then installs these routes into the Routing Engine's forwarding table. The Junos OS kernel then copies this forwarding table to the Packet Forwarding Engine.

The routing protocol process maintains multiple routing tables. By default, it maintains the following three routing tables. You can configure additional routing tables to suit your requirements.

- Unicast routing table—Stores routing information for all unicast routing protocols running on the router. BGP, IS-IS, OSPF, and RIP all store their routing information in this routing table. You can configure additional routes, such as static routes, to be included in this routing table. BGP, IS-IS, OSPF, and RIP use the routes in this routing table when advertising routing information to their neighbors.
- Multicast routing table (cache)—Stores routing information for all the running multicast protocols. DVMRP and PIM both store their routing information in this routing table, and you can configure additional routes to be included in this routing table.
- MPLS routing table—Stores MPLS path and label information.

With each routing table, the routing protocol process uses the collected routing information to determine active routes to network destinations.

For unicast routes, the routing protocol process determines active routes by choosing the most preferred route, which is the route with the lowest preference value. By default, the route's preference value is simply a function of how the routing protocol process learned about the route. You can modify the default preference value using routing policy and with software configuration parameters.

For multicast traffic, the routing protocol process determines active routes based on traffic flow and other parameters specified by the multicast routing protocol algorithms. The routing protocol process then installs one or more active routes to each network destination into the Routing Engine's forwarding table.

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Routing Policy Overview

By default, all routing protocols place their routes into the routing table. When advertising routes, the routing protocols by default advertise only a limited set of routes from the routing table. Specifically, each routing protocol exports only the active routes that were learned by that protocol. In addition, the interior gateway protocols (IS-IS, OSPF, and RIP) export the direct (interface) routes for the interfaces on which they are explicitly configured.

You can control the routes that a protocol places into each table and the routes from that table that the protocol advertises. You do this by defining one or more routing policies and then applying them to the specific routing protocol.

Routing policies applied when the routing protocol places routes into the routing table are referred to as *import policies* because the routes are being imported into the routing table. Policies applied when the routing protocol is advertising routes that are in the routing table are referred to as *export policies* because the routes are being exported from the routing table. In other words, the terms *import* and *export* are used with respect to the routing table.

A routing policy enables you to control (filter) which routes a routing protocol imports into the routing table and which routes a routing protocol exports from the routing table. A routing policy also enables you to set the information associated with a route as it is being imported into or exported from the routing table. Filtering imported routes enables you to control the routes used to determine active routes. Filtering routes being exported from the routing table enables you to control the routes that a protocol advertises to its neighbors.

A defined routing policy specifies the conditions to use to match a route and the action to perform on the route when a match occurs. For example, when a routing table imports routing information from a routing protocol, a routing policy might modify the route's preference, mark the route with a color to identify it and allow it to be manipulated later, or prevent the route from even being installed in a routing table. When a routing table exports routes into a routing protocol, a policy might assign metric values, modify the BGP community information, tag the route with additional information, or prevent the route from being exported altogether. You also can define policies for redistributing the routes learned from one protocol into another protocol.

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Junos OS Support for VPNs

Junos OS supports several types of virtual private networks (VPNs):

- Layer 2 VPNs link a set of sites that share routing information, and whose connectivity is controlled by a collection of policies. A Layer 2 VPN is not aware of routes within your network. It simply provides private links between sites over the service provider's existing public Internet backbone.
- Layer 3 VPNs are the same as a Layer 2 VPN, but it is aware of routes within your network, requiring more configuration on the part of the service provider than a Layer 2 VPN. The sites that make up a Layer 3 VPN are connected over a service provider's existing public Internet backbone.
- Interprovider VPNs supply connectivity between two VPNs in separate autonomous systems (ASs). This functionality can be used by a VPN user with connections to several Internet service providers (ISPs), or different connections to the same ISP in various geographic regions.
- Carrier-of-carrier VPNs allow a VPN service provider to supply VPN service to a someone who is also a service provider. The latter service provider supplies Internet or VPN service to an end user.

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Configuring FIB Localization

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FIB Localization Overview

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

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

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

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

When FIB localization is configured on a router with some Flexible PIC Concentrators (FPCs) being FIB-remote and some others being FIB-local, packets arriving on the interface of the FIB-remote FPC are forwarded to one of the FIB-local FPCs for route lookup and forwarding.

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

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

NOTE: On MX Series routers, you can configure multiservices Dense Port Concentrators (DPCs) as FIB-remote. However, only Modular Port Concentrators (MPCs) can be configured as FIB-local. FIB-localization is supported only for redundant link services intelligent queuing interfaces that carry Multilink Point-to-Point Protocol (MLPPP) traffic.

Example: Configuring Packet Forwarding Engine FIB Localization

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- [Overview | 29](#)
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- [Verification | 32](#)

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

Requirements

Before you begin:

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

This example uses the following hardware and software components:

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

Overview

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

Configuration

CLI Quick Configuration

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

R0

```

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

```

Step-by-Step Procedure

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

To configure Packet Forwarding Engine FIB localization:

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

```

[edit chassis]
user@R0# set route-localization inet
user@R0# set route-localization inet6

```

2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

```

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

```

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

```

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

```

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

4. Enable the routing policy in the forwarding table by configuring the forwarding table with the **fib-policy** statement.

```
[edit routing-options]
user@R0# set forwarding-table export fib-policy
```

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

Results

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

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

```
user@R0# show policy-options
policy-statement fib-policy {
  term a {
    from {
      route-filter 4.4.4.4/32 exact;
```

```

    }
    then no-route-localize;
  }
  term b {
    from {
      route-filter fec0:4444::4/128 exact;
    }
    then no-route-localize;
  }
  then accept;
}
}

```

Verification

IN THIS SECTION

- [Verifying Policy Configuration | 32](#)
- [Verifying FIB-Localization Configuration | 33](#)
- [Verifying Routes After the Policy Is Applied | 34](#)

Confirm that the configuration is working properly.

Verifying Policy Configuration

Purpose

Verify that the configured policy exists.

Action

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

```
user@R0> show policy fib-policy
```

```

Policy fib-policy:
  Term a:
    from
      route filter:
        4.4.4.4/32 exact
    then no-route-localize
  Term b:
    from

```

```

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

```

Verifying FIB-Localization Configuration

Purpose

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

Action

user@R0> **show route localization**

```

FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
  FIB-local:  FPC2(4,5)
  FIB-remote: FPC0, FPC1
  Normal:     FPC3, FPC4, FPC5, FPC6, FPC7

```

user@R0> **show route localization detail**

```

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

```


Verifying Routes After the Policy Is Applied

Purpose

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

Action

user@R0> **show route 4.4.4.4/32 extensive**

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

RELATED DOCUMENTATION

fib-local

fib-remote

no-route-localize

route-localization

Allocating More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels

The jtree memory on all MX Series, all M120, and some M320, M10i, M7i, T640, T1600, TX Matrix, TX Matrix Plus router Packet Forwarding Engines has two segments: One segment primarily stores routing tables and related information, and the other mainly stores firewall-filter-related information.

The Junos OS provides the **memory-enhanced** statement to reallocate the jtree memory for routes, firewall filters, and Layer 3 VPNs. The statement has the following options:

- **filter**—Include this statement when you want to support larger firewall filters over routing tables. However, we recommend enabling this option only if you do not have a very large routing table configuration.

To allocate more memory for firewall filters, include the **filter** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
filter;
```

- **route**—Include this statement when you want to support larger routing tables (with more routes) over firewall filters. For example, you can enable this option, when you want to support a large number of routes for Layer 3 VPNs implemented using MPLS. However, we recommend enabling this option only if you do not have a very large firewall configuration.

To allocate more memory for routing tables, include the **route** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
route;
```

- **vpn-label**—Include this statement when you want to enhance memory to support a larger number of Layer 3 VPN labels.

Layer 3 VPN composite next hops can be enabled by including the **l3vpn-composite-nexthop** statement at the **[edit routing-options]** and **[edit logical-systems logical-system-name routing-options]** hierarchy levels. This statement enables BGP to accept larger numbers of Layer 3 VPN BGP updates with unique inner VPN labels. Including the **l3vpn-composite-nexthop** in the configuration enhances scaling and convergence performance of PE routers participating in a Layer 3 VPN in a multivendor environment. For more information on configuring the **l3vpn-composite-nexthop** statement, see the *Junos OS VPNs Library for Routing Devices*.

To allocate more memory to support a larger number of Layer 3 VPN labels accepted by the **l3vpn-composite-nexthop** statement, include the **vpn-label** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
vpn-label;
```

The **memory-enhanced vpn-label** statement increases the size of the fabric next-hop table, which is held on the egress FPC in the jtree, from the default value of 128,000 entries to 1,000,000 entries. This improves token fabric scaling, at the expense of additional segment 1 usage. This functionality is not applicable to MX Series or M320 platforms, as these platforms provide for flexibly sized fabric token tables by default. This means that the **memory-enhanced route** statement is applicable to T Series platforms and that you can configure both **memory-enhanced vpn-label** and **memory-enhanced route** on T Series platforms when their combined functionality is desired.

You can configure the **memory-enhanced** statement on the following routers:

- M10i and M7i routers with Enhanced CFEB
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- M120 routers
- MX Series routers with DPC (I-chip based) line cards
- T Series (T640, T1600, TX Matrix, and TX Matrix Plus) routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC4.

NOTE:

- The following hardware is not supported for the TXP-T1600 configuration for Junos OS Release 10.0 and earlier releases. If you plan to run a release prior to Junos OS Release 10.0, you must remove the following FPCs and any PICs that require these FPCs prior to integrating the LCC into the routing matrix:
 - All type 1 FPCs
 - All type 2 FPCs
 - T640 Enhanced Scaling FPC4-1P FPCs
- The following hardware is not supported for the TXP-T1600-3D or TXP-Mixed-LCC-3D configuration:
 - T640-FPC1-E and T640-FPC1-E2
 - T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
 - T640-FPC3, T640-FPC3-E, and T640-FPC3-E2

As the allocation of more memory for routing tables or firewall filters might disrupt the forwarding operations of a Packet Forwarding Engine, the Junos OS CLI displays a warning to restart all affected FPCs when you

commit a configuration that includes the **memory-enhanced route** statement. The configuration does not become effective until you restart the FPC or DPC (on MX Series routers).

To restart a single FPC or DPC without rebooting the entire router, issue the **request chassis fpc slot *slot-number* restart** command. On an M120 router, issue the **request chassis feb slot *slot-number* restart** command.

To view if the configuration is active on an FPC or DPC, issue the **show pfe fpc *slot-number*** command. The **show pfe fpc** command output shows the information about reallocation of the jtree memory on Packet Forwarding Engines.

NOTE:

- For T Series routers only. With Junos OS Release 10.2, enhanced jtree memory allocation is disabled by default. For Junos OS Releases 9.3 through 10.1, the default routing tables (**inet.0** and **inet6.0**) use both memory segments by default.
- In Junos OS Release 11.2 and later, the **memory-enhanced route** statement at the **[edit chassis]** hierarchy level replaces the route-memory-enhanced statement at the **[edit chassis]** hierarchy level.
- The **filter** and **vpn-label** statements are supported only on T Series routers.

Junos OS Security Overview

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- Junos OS Default Settings for Router Security | 44

Junos OS Features for Router Security

IN THIS SECTION

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- Junos OS Supported Protocols and Methods for User Authentication | 40
- Junos OS Plain-Text Password Requirements | 41
- Junos OS Support for Routing Protocol Security Features and IPsec | 42
- Junos OS Support for Firewall Filters | 42
- Junos OS Support Distributed Denial-of-Service Protection | 43
- Junos OS Auditing Support for Security | 43

Router security consists of three major elements: Physical security of the router, operating system security, and security that can be affected through configuration.

Physical security involves restricting access to the router. Exploits that can easily be prevented from remote locations are extremely difficult or impossible to prevent if an attacker can gain access to the router's management port or console. The inherent security of Junos OS also plays an important role in router security. Junos OS is extremely stable and robust, and provides features to protect against attacks, allowing you to configure the router to minimize vulnerabilities.

The following are Junos OS features available to improve router security:

Methods of Remote Access for Router Management

When you first install Junos OS, all remote access to the router is disabled, thereby ensuring that remote access is possible only if deliberately enabled by an authorized user. You can establish remote communication with a router in one of the following ways:

- **Out-of-band management:** Enables connection to the router through an interface dedicated to router management. Juniper Networks routers support out-of-band management with a dedicated management Ethernet interface, as well as EIA-232 console and auxiliary ports. On all routers other than the TX Matrix Plus router, T1600 router, T1600 or T4000 routers connected to a TX Matrix Plus router in a routing matrix, T640 routers with a Routing Engine supporting 64-bit Junos OS, and PTX Series Packet Transport Routers, the management interface is fxp0. On a TX Matrix Plus router, T1600 router, T1600 or T4000 routers in a routing matrix, T640 routers with a Routing Engine supporting 64-bit Junos OS, and PTX Series Packet Transport Routers, the management Ethernet Interface is labeled em0. The management Ethernet interface connects directly to the Routing Engine. No transit traffic is allowed through this interface, providing complete separation of customer and management traffic and ensuring that congestion or failures in the transit network do not affect the management of the router.
- **Inband management:** Enables connection to the routers using the same interfaces through which customer traffic flows. Although this approach is simple and requires no dedicated management resources, it has two disadvantages:
 - Management flows and transit traffic flows are mixed together. Any attack traffic that is mixed with the normal traffic can affect the communication with the router.
 - The links between router components might not be totally trustworthy, leading to the possibility of wiretapping and replay attacks.

For management access to the router, the standard ways to communicate with the router from a remote console are with Telnet and SSH. SSH provides secure encrypted communications and is therefore useful for inband router management. Telnet provides unencrypted, and therefore less secure, access to the router.

Junos OS Supported Protocols and Methods for User Authentication

On a router, you can create local user login accounts to control who can log in to the router and the access privileges they have. A password, either an SSH key or a Message Digest 5 (MD5) password, is associated with each login account. To define access privileges, you create login classes into which you group users with similar jobs or job functions. You use these classes to explicitly define what commands their users are and are not allowed to issue while logged in to the router.

The management of multiple routers by many different personnel can create a user account management problem. One solution is to use a central authentication service to simplify account management, creating and deleting user accounts only on a single, central server. A central authentication system also simplifies the use of one-time password systems such as SecureID, which offer protection against password sniffing

and password replay attacks (attacks in which someone uses a captured password to pose as a router administrator).

Junos OS supports two protocols for central authentication of users on multiple routers:

- Terminal Access Controller Access Control System Plus (TACACS+).
- Remote Authentication Dial-In User Service (RADIUS), a multivendor IETF standard whose features are more widely accepted than those of TACACS+ or other proprietary systems. All one-time-password system vendors support RADIUS.

Junos OS also supports the following authentication methods:

- Internet Protocol Security (IPsec). IPsec architecture provides a security suite for the IPv4 and IPv6 network layers. The suite provides such functionality as authentication of origin, data integrity, confidentiality, replay protection, and nonrepudiation of source. In addition to IPsec, Junos OS supports the Internet Key Exchange (IKE), which defines mechanisms for key generation and exchange, and manages security associations (SAs).
- MD5 authentication of MSDP peering sessions. This authentication provides protection against spoofed packets being introduced into a peering session.
- SNMPv3 authentication and encryption. SNMPv3 uses the user-based security model (USM) for message security and the view-based access control model (VACM) for access control. USM specifies authentication and encryption. VACM specifies access-control rules.

Junos OS Plain-Text Password Requirements

Junos OS has special requirements when you create plain-text passwords on a router. The default requirements for plain-text passwords are as follows:

- The password must be between 6 and 128 characters long.
- You can include uppercase letters, lowercase letters, numbers, punctuation marks, and any of the following special characters:
! @ # \$ % ^ & * , + = < > : ;
Control characters are not recommended.
- The password must contain at least one change of case or character class.

You can change the requirements for plain-text passwords.

You can include the **plain-text-password** statement at the following hierarchy levels:

- [edit system diag-port-authentication]
- [edit system pic-console-authentication]

- [edit system root-authentication]
- [edit system login user *username* authentication]

Junos OS Support for Routing Protocol Security Features and IPsec

The main task of a router is to forward user traffic toward its intended destination based on the information in the router's routing and forwarding tables. You can configure routing policies that define the flows of routing information through the network, controlling which routes the routing protocols place in the routing tables and which routes they advertise from the tables. You can also use routing policies to change specific route characteristics, change the BGP route flap-damping values, perform per-packet load balancing, and enable class of service (CoS).

Attackers can send forged protocol packets to a router with the intent of changing or corrupting the contents of its routing table or other databases, which can degrade the functionality of the router. To prevent such attacks, you must ensure that routers form routing protocol peering or neighboring relationships with trusted peers. One way to do this is by authenticating routing protocol messages. The Junos OS BGP, IS-IS, OSPF, RIP, and RSVP protocols all support HMAC-MD5 authentication, which uses a secret key combined with the data being protected to compute a hash. When the protocols send messages, the computed hash is transmitted with the data. The receiver uses the matching key to validate the message hash.

Junos OS supports the IPsec security suite for the IPv4 and IPv6 network layers. The suite provides such functionality as authentication of origin, data integrity, confidentiality, replay protection, and nonrepudiation of source. Junos OS also supports IKE, which defines mechanisms for key generation and exchange, and manages SAs.

Junos OS Support for Firewall Filters

Firewall filters allow you to control packets transiting the router to a network destination and packets destined for and sent by the router. You can configure firewall filters to control which data packets are accepted on and transmitted from the physical interfaces, and which local packets are transmitted from the physical interfaces and the Routing Engine. Firewall filters provide a means of protecting your router from excessive traffic. Firewall filters that control local packets can also protect your router from external aggressions, such as DoS attacks.

To protect the Routing Engine, you can configure a firewall filter only on the router's loopback interface. Adding or modifying filters for each interface on the router is not necessary. You can design firewall filters to protect against ICMP and Transmission Control Protocol (TCP) connection request (SYN) floods and to rate-limit traffic being sent to the Routing Engine.

Junos OS Support Distributed Denial-of-Service Protection

A denial-of-service attack is any attempt to deny valid users access to network or server resources by using up all the resources of the network element or server. Distributed denial-of-service attacks involve an attack from multiple sources, enabling a much greater amount of traffic to attack the network. The attacks typically use network protocol control packets to trigger a large number of exceptions to the router's control plane. This results in an excessive processing load that disrupts normal network operations.

Junos OS DDoS protection enables the router to continue functioning while under an attack. It identifies and suppresses malicious control packets while enabling legitimate control traffic to be processed. A single point of DDoS protection management enables network administrators to customize profiles for their network control traffic. Protection and monitoring persists across graceful Routing Engine switchover (GRES) and unified in-service-software-upgrade (ISSU) switchovers. Protection is not diminished as the number of subscribers increases.

To protect against DDoS attacks, you can configure policers for host-bound exception traffic. The policers specify rate limits for individual types of protocol control packets or for all control packet types for a protocol. You can monitor policer actions for packet types and protocol groups at the level of the router, Routing Engine, and line cards. You can also control logging of policer events.

Flow detection is an enhancement to DDoS protection that supplements the DDoS policer hierarchies by using a limited amount of hardware resources to monitor the arrival rate of host-bound flows of control traffic. Flow detection is much more scalable than a solution based on filter policers. Filter policers track all flows, which consumes a considerable amount of resources. In contrast, flow detection only tracks flows it identifies as suspicious, using far fewer resources to do so.

The flow detection application has two interrelated components, detection and tracking. Detection is the process where flows suspected of being improper are identified and subsequently controlled. Tracking is the process where flows are tracked to determine whether they are truly hostile and when these flows recover to within acceptable limits.

Junos OS Auditing Support for Security

Junos OS logs significant events that occur on the router and within the network. Although logging itself does not increase security, you can use the system logs to monitor the effectiveness of your security policies and router configurations. You can also use the logs when reacting to a continued and deliberate attack as a means of identifying the source address, router, or port of the attacker's traffic. You can configure the logging of different levels of events, from only critical events to all events, including informational events. You can then inspect the contents of the system log files either in real time or later.

Debugging and troubleshooting are much easier when the timestamps in the system log files of all routers are synchronized, because events that span the network might be correlated with synchronous entries in multiple logs. Junos OS supports the Network Time Protocol (NTP), which you can enable on the router to synchronize the system clocks of routers and other networking equipment. By default, NTP operates

in an unauthenticated mode. You can configure various types of authentication, including an HMAC-MD5 scheme.

RELATED DOCUMENTATION

Overview of IPsec

Junos OS System Log Overview

Junos OS Default Settings for Router Security

Junos OS protects against common router security weaknesses with the following default settings:

- Junos OS does not forward directed broadcast messages. Directed broadcast services send ping requests from a spoofed source address to a broadcast address and can be used to attack other Internet users. For example, if broadcast ping messages were allowed on the 200.0.0.0/24 network, a single ping request could result in up to 254 responses to the supposed source of the ping. The source would actually become the victim of a denial-of-service (DoS) attack.
- Only console access to the router is enabled by default. Remote management access to the router and all management access protocols, including Telnet, FTP, and SSH (Secure Shell), are disabled by default.
- Junos OS does not support the SNMP set capability for editing configuration data. Although the software supports the SNMP set capability for monitoring and troubleshooting the network, this support exposes no known security issues. (You can configure the software to disable this SNMP set capability.)
- Junos OS ignores martian (intentionally non-routable) IP addresses that contain the following prefixes: 0.0.0.0/8, 127.0.0.0/8, 128.0.0.0/16, 191.255.0.0/16, 192.0.0.0/24, 223.255.55.0/24, and 240.0.0.0/4. Martian addresses are reserved host or network addresses about which all routing information should be ignored.

Junos OS Configuration Overview

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- [Methods for Configuring Junos OS | 46](#)
- [Junos OS Configuration from External Devices | 50](#)
- [Junos OS Commit Model for Configurations | 50](#)
- [Understanding Junos OS Configuration Groups | 52](#)

Junos OS Configuration Basics

Your router comes with Junos OS installed on it. When you power on the router, all software starts automatically. You simply need to configure the software so the router will be ready to participate in the network.

To configure the Junos OS, you must specify a hierarchy of configuration statements which define the preferred software properties. You can configure all properties of the Junos OS, including interfaces, general routing information, routing protocols, and user access, as well as some system hardware properties. After you have created a candidate configuration, you commit the configuration to be evaluated and activated by Junos OS.

RELATED DOCUMENTATION

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[Initial Router or Switch Configuration Using Junos OS | 57](#)

Methods for Configuring Junos OS

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- Junos XML Management Protocol Software | 48
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- Configuration Commit Scripts | 49

You can use any of the methods shown in [Table 6 on page 47](#) to configure Junos OS.

Table 6: Methods for Configuring Junos OS

Method	Description
Command-line interface (CLI)	Create the configuration for the device using the CLI. You can enter commands from a single command line, and scroll through recently executed commands.
ASCII file	Load an ASCII file containing a configuration that you created earlier, either on this system or on another system. You can then activate and run the configuration file, or you can edit it using the CLI and then activate it.
J-Web graphical user interface (GUI)	Use the J-Web GUI to configure the device. J-Web enables you to monitor, configure, troubleshoot, and manage the router on a client by means of a Web browser. The J-Web GUI is preinstalled on J Series Routers and is an optional software package that can be installed on M Series and T Series routers. J-Web is not available for the QFX Series.
Junos XML management protocol (API)	Use Junos XML protocol Perl client modules to develop custom applications for configuring information on devices that run Junos OS. Client applications use the Junos XML management protocol to request and change configuration information on Juniper Networks J Series, M Series, and T Series routers. The Junos XML management protocol is customized for Junos OS, and operations in the API are equivalent to those in the Junos OS CLI.
NETCONF application programming interface (API)	Use NETCONF Perl client modules to develop custom applications for configuring information on devices that run Junos OS. Client applications use the NETCONF XML management protocol to request and change configuration information on Juniper Networks J Series, M Series, and T Series routers. The NETCONF XML management protocol includes features that accommodate the configuration data models of multiple vendors.
Configuration commit scripts	Create scripts that run at commit time to enforce custom configuration rules. Commit scripts are written in Extensible Stylesheet Language Transformations (XSLT). Commit scripts are not available for the QFX Series.

The following sections describe the methods you can use to configure Junos OS:

Junos OS Command-Line Interface

The Junos OS CLI is a straightforward terminal-based command interface. You use Emacs-style keyboard sequences to move around on a command line and scroll through a buffer that contains recently executed commands. You type commands on a single line, and the commands are executed when you press the Enter key. The CLI also provides command help and command completion.

ASCII File

You can load an ASCII file containing a configuration that you created earlier, either on this system or another system. You can then activate and run the configuration file as is, or you can edit it using the CLI and then activate it.

J-Web Package

As an alternative to entering CLI commands, Junos OS supports the J-Web GUI. The J-Web user interface enables you to monitor, configure, troubleshoot, and manage the router on a client by means of a Web browser with Hypertext Transfer Protocol (HTTP) or HTTP over Secure Sockets Layer (HTTPS) enabled.

The J-Web user interface is preinstalled on J Series Routers. It is provided as an optional, licensed software package (jweb package) on M Series and T Series routers. The jweb package is not included in jinstall and jbundle software bundles. It must be installed separately. To install the package on M Series and T Series routers, follow the procedure described in the *Software Installation and Upgrade Guide*.

J-Web supports weak (56-bit) encryption by default. This enables non-US customers to install J-Web and use HTTPS connections for J-Web access. US customers can also install the jcrypto strong encryption package. This package automatically overrides the weak encryption.

NOTE: Because the J-Web package is bundled separately from other packages, it is possible to have a version mismatch between J-Web and other Junos OS packages you have installed.

To check for a version mismatch, use the **show system alarms** CLI command. If the version number does not match exactly, a system alarm appears. For example, if you install the 7.4R1.2 jroute package and the 7.4R1.1 jweb package, an alarm is activated.

Junos XML Management Protocol Software

The Junos XML management protocol is an Extensible Markup Language (XML) application that client applications use to request and change configuration information on Juniper Networks J Series, M Series, MX Series, and T Series routers. This API is customized for Junos OS, and operations in the API are equivalent to Junos OS CLI configuration mode commands. The Junos XML management protocol includes

a set of Perl modules that enable client applications to communicate with a Junos XML protocol server on the router. The Perl modules are used to develop custom applications for configuring and monitoring Junos OS.

NETCONF XML Management Protocol Software

The NETCONF XML management protocol is an Extensible Markup Language (XML) application that client applications can use to request and change configuration information on Juniper Networks J Series, M Series, MX Series, and T Series routers. This API is customized for Junos OS, and includes features that accommodate the configuration data models of multiple vendors. The NETCONF XML management protocol includes a set of Perl modules that enable client applications to communicate with a NETCONF server on the router. The Perl modules are used to develop custom applications for configuring and monitoring Junos OS.

Configuration Commit Scripts

You can create and use scripts that run at commit time to enforce custom configuration rules. If a configuration breaks the custom rules, the script can generate actions that the Junos OS performs. These actions include:

- Generating custom error messages
- Generating custom warning messages
- Generating custom system log messages
- Making changes to the configuration

Configuration commit scripts also enable you to create macros, which expand simplified custom aliases for frequently used configuration statements into standard Junos OS configuration statements. Commit scripts are written in Extensible Stylesheet Language Transformations (XSLT).

RELATED DOCUMENTATION

[CLI Explorer](#)

[CLI User Guide](#)

[J-Web Interface User Guide](#)

[Automation Scripting Feature Guide](#)

[Junos OS Configuration from External Devices | 50](#)

[Junos XML Management Protocol Developer Guide](#)

[NETCONF XML Management Protocol Developer Guide](#)

[M Series and T Series routers: Software Installation and Upgrade Guide](#)

Junos OS Configuration from External Devices

You can configure Junos OS network device from a system console connected to the console port or by using Telnet to access the device remotely. External management hardware can be connected to the Routing Engine and the Junos OS through these ports:

- Console port
- Auxiliary port
- Ethernet management port

NOTE: See hardware guide for your particular Junos OS device for instructions about how to connect external hardware to the console, auxiliary, and/or Ethernet management ports. Capabilities and features can vary depending on device model.

RELATED DOCUMENTATION

[Methods for Configuring Junos OS | 46](#)

[Configuring Junos OS to Set Console and Auxiliary Port Properties | 84](#)

Junos OS Commit Model for Configurations

The device configuration is saved using a commit model—a candidate configuration is modified as desired and then committed to the system. When a configuration is committed, the device checks the configuration for syntax errors, and if no errors are found, the configuration is saved as **juniper.conf.gz** and activated. The formerly active configuration file is saved as the first rollback configuration file (**juniper.conf.1.gz**), and any other rollback configuration files are incremented by 1. For example, **juniper.conf.1.gz** is incremented to **juniper.conf.2.gz**, making it the second rollback configuration file. The device can have a maximum of 49 rollback configurations (numbered 1 through 49) saved on the system.

On the device, the active configuration file and the first three rollback files (**juniper.conf.gz.1**, **juniper.conf.gz.2**, **juniper.conf.gz.3**) are located in the **/config** directory. If the file **rescue.conf.gz** is saved on the system, this file should also be saved in the **/config** directory. The factory default files are located in the **/etc/config** directory.

There are two mechanisms used to propagate the configurations between Routing Engines within a device:

- Synchronization: Propagates a configuration from one Routing Engine to a second Routing Engine within the same device chassis.

NOTE: The QFX3500 switch has only one Routing Engine.

To synchronize configurations, use the **commit synchronize** CLI command. If one of the Routing Engines is locked, the synchronization fails. If synchronization fails because of a locked configuration file, you can use the **commit synchronize force** command. This command overrides the lock and synchronizes the configuration files.

- Distribution: Propagates a configuration across the routing plane on a multichassis device. Distribution occurs automatically. There is no user command available to control the distribution process. If a configuration is locked during a distribution of a configuration, the locked configuration does not receive the distributed configuration file, so the synchronization fails. You need to clear the lock before the configuration and resynchronize the routing planes.

NOTE: When you use the **commit synchronize force** CLI command on a multichassis platform, the forced synchronization of the configuration files does not affect the distribution of the configuration file across the routing plane. If a configuration file is locked on a device remote from the device where the command was issued, the synchronization fails on the remote device. You need to clear the lock and reissue the **synchronization** command.

Committing a Junos OS Configuration and Exiting Configuration Mode

To save Junos OS configuration changes, activate the configuration on the device and exit configuration mode, using the **commit and-quit** configuration mode command. This command succeeds only if the configuration contains no errors.

```
[edit]
user@host# commit and-quit
commit complete
exiting configuration mode
user@host>
```

NOTE: We do not recommend performing a commit operation on the backup Routing Engine when graceful Routing Engine switchover is enabled on the router.

RELATED DOCUMENTATION

[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 58](#)

Understanding Junos OS Configuration Groups

IN THIS SECTION

- [Configuration Groups Overview | 52](#)
- [Inheritance Model | 53](#)
- [Configuring Configuration Groups | 53](#)

This topic provides an overview of the configuration groups feature and the inheritance model in Junos OS.

Configuration Groups Overview

The configuration groups feature in Junos OS enables you to create a group containing configuration statements and to direct the inheritance of that group's statements in the rest of the configuration. The same group can be applied to different sections of the configuration, and different sections of one group's configuration statements can be inherited in different places in the configuration.

Configuration groups enable you to create smaller, more logically constructed configuration files, making it easier to configure and maintain Junos OS. For example, you can group statements that are repeated in many places in the configuration, such as when configuring interfaces, and thereby limit updates to just the group.

You can also use wildcards in a configuration group to allow configuration data to be inherited by any object that matches a wildcard expression.

The configuration group mechanism is separate from the grouping mechanisms used elsewhere in the configuration, such as BGP groups. Configuration groups provide a generic mechanism that can be used throughout the configuration but that are known only to the Junos OS CLI. The individual software processes that perform the actions directed by the configuration receive the expanded form of the configuration; they have no knowledge of configuration groups.

Inheritance Model

Configuration groups use true inheritance, which involves a dynamic, ongoing relationship between the source of the configuration data and the target of that data. Data values changed in the configuration group are automatically inherited by the target. The target does not need to contain the inherited information, although the inherited values can be overridden in the target without affecting the source from which they were inherited.

This inheritance model allows you to see only the instance-specific information without seeing the inherited details. A command pipe in configuration mode allows you to display the inherited data.

Configuring Configuration Groups

For areas of your configuration to inherit configuration statements, you must first put the statements into a configuration group and then apply that group to the levels in the configuration hierarchy that require the statements.

To configure configuration groups and inheritance, you can include the **groups** statement at the **[edit]** hierarchy level:

```
[edit]
groups {
  group-name {
    configuration-data;
  }
}
```

Include the **apply-groups [group-names]** statement anywhere in the configuration where the configuration statements contained in a configuration group are needed.

2

PART

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Configuring Junos Devices

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Initial Router or Switch Configuration Using Junos OS

This topic provides an overview of initial network device configuration tasks using Junos OS.

When you turn on a device for the first time, Junos OS automatically boots and starts. You must enter basic configuration information so the device is on the network and you can log in to it over the network.

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

When you first connect to the device console, you must log in as the user **root**. At first, the root account requires no password. You see that you are the user **root**, because the command prompt shows the username **root@#**.

You must start the Junos OS command-line interface (CLI) using the command **cli**. The command prompt **root@>** indicates that you are the user **root** and that you are in Junos OS operational mode. Enter Junos OS configuration mode by typing the command **configure**. The command prompt **root@#** indicates that you are in the Junos OS configuration mode.

When you first configure a device, you must configure the following basic properties:

- Device hostname
- Domain name
- IP address of the device management Ethernet interface. To find the management Ethernet interface that you should use for configuration, see *Supported Routing Engines by Router*.
- IP address of a backup router
- IP address of one or more DNS name servers on your network
- Password for the root account

RELATED DOCUMENTATION

[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 58](#)

[Configuring Junos OS for the First Time on a Device with Dual Routing Engines | 63](#)

Supported Routing Engines by Router

[Junos OS Configuration Using the CLI | 69](#)

Configuring Junos OS for the First Time on a Device with a Single Routing Engine

To configure the Junos OS for the first time on a router with a single Routing Engine, follow these steps:

1. Connect a terminal or laptop computer to the device through the console port on the front of the device. Only console access to the device is enabled by default.
2. Power on the device and wait for it to boot.

The 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@#
```

6. Configure the hostname of the device. We do not recommend spaces in the router name. However, if the name does include spaces, enclose the entire name in quotation marks (" ").

```
[edit]
root@# set system host-name hostname
```

7. Configure the device domain name:

```
[edit]
root@# set system domain-name domain-name
```

NOTE: Before you begin the next step, see *Supported Routing Engines by Router* to find the management Ethernet interface that you should use to perform this configuration.

8. Configure the IP address and prefix length for the device management Ethernet interface. The management Ethernet interface provides a separate out-of-band management network for the device.

- For devices that use management Ethernet interface fxp0:

```
[edit]
root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

- For devices that use management Ethernet interface em0:


```
[edit]
root@# set interfaces em0 unit 0 family inet address address/prefix-length
```

To use em0 as an out-of-band management Ethernet interface, you must configure its logical port, em0.0, with a valid IP address.

9. Configure the IP address of a backup or default network device. This device is called the backup because it is used only while the routing protocol process is not running. Choose a device that is directly connected to the local router by way of the management interface. This backup is used only when it is booting and only or when the Junos routing software (the routing protocol process, rpd) is not running.

For devices with two Routing Engines, the backup Routing Engine, **RE1**, uses the backup device as a default gateway after the device boots. This enables you to access the backup Routing Engine. (**RE0** is the default master Routing Engine.)

NOTE: The backup Routing Engine does not support more than 16 destinations. If you configure more than 16 destinations on the backup Routing Engine, the Junos OS ignores any destination addresses after the sixteenth address and displays a commit-time warning message to this effect.

```
[edit]
root@# set system backup-router address
```

10. Configure the IP address of a DNS server. The router uses the DNS name server to translate hostnames into IP addresses.

```
[edit]
root@# set system name-server address
```

11. Set the root password, entering either a clear-text password that the system will encrypt, a password that is already encrypted, or an SSH public key string.

Choose one of the following:

- a. To enter a clear-text password, use the following command:

```
[edit]
root@# set system root-authentication plain-text-password
New password: type password
Retype new password: retype password
```

- b. To enter a password that is already encrypted, use the following command:

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

- c. To enter an SSH public key, use the following command:

```
[edit]
root@# set system root-authentication ssh-rsa key
```

12. Optionally, display the configuration statements:

```
[edit]
root@ show
system {
  host-name hostname;
  domain-name domain.name;
  backup-router address;
  root-authentication {
    (encrypted-password "password" | public-key);
    ssh-dsa "public-key";
    ssh-ecdsa "public-key";
    ssh-rsa "public-key";
  }
  name-server {
    address;
  }
  interfaces {
    fxp0 {
      unit 0 {
        family inet {
          address address ;
        }
      }
    }
  }
}
```

On devices that use management Ethernet interface em0, you will see em0 in place of fxp0 in the **show** command output.

13. Commit the configuration, which activates the configuration on the device:

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

After committing the configuration, you see the newly configured hostname appear after the username in the prompt—for example, **user@host#**.

The defaults for Junos OS are now set on the device.

If you want to configure additional Junos OS properties at this time, remain in the CLI configuration mode and add the necessary configuration statements. You need to commit your configuration changes to activate them on the device.

14. Exit from the CLI configuration mode.

```
[edit]
root@hostname# exit
root@hostname>
```

15. Back up the configuration on the hard drive.

After you have installed the software on the device, committed the configuration, and are satisfied that the new configuration is successfully running, you should issue the **request system snapshot** command to back up the new software to the **/altconfig** file system. If you do not issue the **request system snapshot** command, the configuration on the alternate boot device will be out of sync with the configuration on the primary boot device.

The **request system snapshot** command causes the root file system to be backed up to **/altroot**, and **/config** to be backed up to **/altconfig**. The root and **/config** file systems are on the device's CompactFlash card, and the **/altroot** and **/altconfig** file systems are on the device's hard drive.

NOTE: After you issue the **request system snapshot** command, you cannot return to the previous version of the software, because the running copy and the backup copy of the software are identical.

RELATED DOCUMENTATION

[Initial Router or Switch Configuration Using Junos OS | 57](#)

Supported Routing Engines by Router

[Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements | 70](#)

[Default Directories for Junos OS File Storage on the Network Device | 21](#)

[Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive | 78](#)

Configuring Junos OS for the First Time on a Device with Dual Routing Engines

If a router has dual Routing Engines, you can create configuration groups and use the same configuration for both Routing Engines. This ensures that the configuration will not change during a failover scenario because of the identical configuration shared between the Routing Engines.

Configure the hostnames and addresses of the two Routing Engines using configuration groups at the **[edit groups]** hierarchy level. Use the reserved configuration group **re0** for the Routing Engine in slot 0 and **re1** for the Routing Engine in slot 1 to define Routing Engine-specific parameters. Configuring **re0** and **re1** groups enables both Routing Engines to use the same configuration file.

Use the **apply-groups** statement to reproduce the configuration group information in the main part of the configuration.

The **commit synchronize** command commits the same configuration on both Routing Engines. The command makes the active or applied configuration the same for both Routing Engines with the exception of the groups, **re0** being applied to only **RE0** and **re1** being applied only to **RE1**. If you do not synchronize the configurations between two Routing Engines and one of them fails, the router may not forward traffic correctly, because the backup Routing Engine may have a different configuration.

To initially configure a router with dual Routing Engines, follow these steps:

1. If you have not already done so, refer [“Configuring Junos OS for the First Time on a Device with a Single Routing Engine” on page 58](#) and follow the steps to initially configure the backup Routing Engine.
2. Create the configuration group **re0**. The **re0** group is a special group designator that is only used by **RE0** in a redundant routing platform.

```
[edit]
root@host# set groups re0
```

3. Navigate to the **groups re0** level of the configuration hierarchy.

```
[edit]
root@host# edit groups re0
```

4. Specify the device hostname.

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

NOTE: The hostname specified in the device configuration is not used by the DNS server to resolve to the correct IP address. This hostname is used to display the name of the Routing Engine in the CLI. For example, the hostname appears at the command-line prompt when you are logged in to the CLI:

```
user-name@host-name>
```

NOTE: Before you begin the next step, see *Supported Routing Engines by Router* to find the management Ethernet interface that you should use to perform this configuration.

5. Configure the IP address and prefix length for the device management Ethernet interface. The management Ethernet interface provides a separate out-of-band management network for the device.

- For devices using the management Ethernet interface fxp0:

```
[edit groups]
root@host# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

- For devices that use the management Ethernet interface em0:

```
[edit groups]
root@host# set interfaces em0 unit 0 family inet address address/prefix-length
```

To use em0 as an out-of-band management Ethernet interface, you must configure its logical port, em0.0, with a valid IP address.

6. Set the loopback interface address for the **re0** configuration group:

```
[edit groups]
root@host# set re0 interfaces lo0 unit 0 family inet address address/prefix-length
```

7. Return to the top level of the hierarchy.

```
[edit groups re0]
root@host# top
```

The next steps repeat for **re1** the same steps as were done for the **re0** configuration group.

8. Create the configuration group **re1**.

```
[edit]
root@host# set groups re1
```

9. Navigate to the **groups re1** level of the configuration hierarchy.

```
[edit]
root@host# edit groups re1
```

10. Specify the device hostname.

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

NOTE: Before you begin the next step, see *Supported Routing Engines by Router* to find the management Ethernet interface that you should use to perform this configuration.

11. Configure the IP address and prefix length for the device management Ethernet interface.

- For devices that use the management Ethernet interface `fxp0`:

```
[edit groups]
root@host# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

- For devices that use the management Ethernet interface `em0`:

```
[edit groups]
root@host# set interfaces em0 unit 0 family inet address address/prefix-length
```

To use `em0` as an out-of-band management Ethernet interface, you must configure its logical port, `em0.0`, with a valid IP address.

12. Set the loopback interface address for **re1** configuration group:

```
[edit groups]
root@host# set re1 interfaces lo0 unit 0 family inet address address/prefix-length
```

13. Once both configuration groups have been set up, return to the top level of the hierarchy.

```
[edit groups re0]
root@host# top
```

14. Configure the **apply-groups** statement to reproduce the configuration group information to the main part of the configuration and to specify the group application order.

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

15. Configure Routing Engine redundancy:

```
[edit]
root@host# set chassis redundancy routing-engine 0 master
root@host# set chassis redundancy routing-engine 1 backup
```

16. Save the configuration change on both Routing Engines:

```
[edit]
user@host> commit synchronize
```

After the configuration changes are saved, complete the management console configuration.

1. Configure the IP address of the DNS server.

```
[edit ]
root@host# set system name-server address
```

2. Configure the router domain name:

```
[edit ]
root@host# set system domain-name domain-name
```

3. Configure the IP address of a backup or default network device. A backup device is used only while the routing protocol process is not running. Choose a backup device that is directly connected to the local device by way of the management interface. The device uses this backup only when it is booting and or when the Junos routing software (the routing protocol process, rpd) is not running. For more information, see *Configuring a Backup Router*.

For devices with two Routing Engines, the backup Routing Engine, **RE1**, uses the backup as a default gateway after the device boots. This enables you to access the backup Routing Engine. (**RE0** is the default master Routing Engine.)

NOTE: The backup router Routing Engine does not support more than 16 destinations. If you configure more than 16 destinations on the backup Routing Engine, the Junos OS ignores any destination addresses after the sixteenth address and displays a commit-time warning message to this effect.

```
[edit]
root@host# set system backup-router address
```

4. Set the root password by choosing one of the following:

- To enter a clear-text password, use the following command:

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

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

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

- To enter an SSH public key, use the following command:

```
[edit]
root@host# set system root-authentication ssh-rsa key
```

5. Optionally, display the configuration statements:

```
[edit]
root@ show
system {
  host-name hostname;
  domain-name domain.name;
  backup-router address;
  root-authentication {
```



```

    (encrypted-password "password" | public-key);
    ssh-dsa "public-key";
    ssh-ecdsa "public-key";
    ssh-rsa "public-key";
  }
  name-server {
    address;
  }
  interfaces {
    fxp0 {
      unit 0 {
        family inet {
          address address ;
        }
      }
    }
  }
}

```

On devices that use management Ethernet interface em0, you will see em0 in place of fxp0 in the **show** command output.

6. After you have installed the new software and are satisfied that it is successfully running, issue the **request system snapshot** command to back up the new software on both master and backup Routing Engines.

```

{master}
user@host> request system snapshot

```

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 device's CompactFlash card, and the **/altroot** and **/altconfig** file systems are on the device's hard drive.

NOTE: After you issue the **request system snapshot** command, you cannot return to the previous version of the software, because the running copy and backup copy of the software are identical.

For information about creating configuration groups, see *CLI User Guide*.

For information about configuring high availability features for redundant Routing Engine systems and the **re0** group, see *High Availability Feature Guide*.

RELATED DOCUMENTATION

[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 58](#)

[*Supported Routing Engines by Router*](#)

[Initial Router or Switch Configuration Using Junos OS | 57](#)

[Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements | 70](#)

[Default Directories for Junos OS File Storage on the Network Device | 21](#)

[Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive | 78](#)

Junos OS Configuration Using the CLI

Junos OS is configured using the Junos OS command-line interface (CLI). The CLI is described in detail in the *CLI User Guide*.

After completing the initial minimal configuration, you can configure software properties. If you configure the software interactively using the CLI, you enter software configuration statements to create a candidate configuration that contains a hierarchy of statements. At any hierarchy level, you generally can enter statements in any order. While you are configuring the software, you can display all or portions of the candidate configuration, and you can insert or delete statements. Any changes you make affect only the candidate configuration, not the active configuration that is running on the router.

The configuration hierarchy logically groups related functions, which results in configuration statements that have a consistent syntax. For example, you configure routing protocols, routing policies, interfaces, and SNMP management in their own separate portions of the configuration hierarchy.

At each level of the hierarchy, you can display a list of the statements available at that level, along with short descriptions of the statements' functions. To have the CLI complete the statement name if it is unambiguous or to provide a list of possible completions, you can type a partial statement name followed by a space or tab.

More than one user can edit a router's configuration simultaneously. All changes made by all users are visible to everyone editing the configuration.

RELATED DOCUMENTATION

[*Disk Space Management for Junos OS Installation*](#)

[Creating and Activating a Candidate Configuration | 72](#)

Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements

Many statements in the Junos OS configuration include an option to specify an IP address or route prefix. This option is represented in one of the following ways:

- **network/prefix-length**—The network portion of the IP address, followed by a slash and the destination prefix length (previously called the subnet mask). For example, 10.0.0.1/8.
- **network**—The IP address. For example, 10.0.0.2.
- **destination-prefix/prefix-length**—The route prefix, followed by a slash and the destination prefix length. For example, 192.168.1.10/32.

You enter all IP addresses in classless mode. You can enter the IP address with or without a prefix length, in standard dotted notation (for example, 1.2.3.4), or hexadecimal notation as a 32-bit number in network-byte order (for example, 0x01020304). If you omit any octets, they are assumed to be zero. Specify the prefix length as a decimal number from 1 through 32.

RELATED DOCUMENTATION

[Format for Specifying Filenames and URLs in Junos OS CLI Commands](#) | 70

Format for Specifying Filenames and URLs in Junos OS CLI Commands

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

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

NOTE: Starting with Junos OS Release 15.1, the **sslv3-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 **sslv3-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 sslv3-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 sslv3-support** command to enable the copying of files from an SSLv3 URL.



WARNING: Using SSLv3 presents a potential security vulnerability, and for this reason we recommend that you not use SSLv3.

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

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

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

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

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

- **a:filename** or **a:path/filename**—A file on the local removable media. The default path is / (the root-level directory). The removable media can be in MS-DOS or UNIX (UFS) format.
- **hostname:/path/filename**, **hostname:filename**, **hostname:path/filename**, or **"scp://hostname/path/filename"**—File on an scp/ssh server. This form is not available in the worldwide version of Junos OS. The default path is the user's home directory on the remote system. You can also specify **hostname** as **username@hostname**.

- **ftp://hostname/path/filename**—File on an FTP server. You can also specify **hostname** as **username@hostname** or **username:password@hostname**. The default path is the user's home directory. To specify an absolute path, the path must start with **%2F**; for example, **ftp://hostname/%2Fpath/filename**. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required and you do not specify the password or **prompt**, an error message is displayed:

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

```
file copy ftp.hostname.net: Not logged in.
```

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

```
Password for username@ftp.hostname.net:
```

- **http://hostname/path/filename**—A file on an HTTP server. You can also specify hostname as **username@hostname** or **username:password@hostname**. If a password is required and you omit it, you are prompted for it.

NOTE: You cannot specify a HTTP(s) URL for a file as a destination, because HTTP(s) URLs are not writable. However you can specify HTTP(s) URL for a file as a source.

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

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

RELATED DOCUMENTATION

[Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements | 70](#)

[Default Directories for Junos OS File Storage on the Network Device | 21](#)

Creating and Activating a Candidate Configuration

You can enter software configuration statements using the CLI to create a candidate configuration that contains a hierarchy of statements. To have a candidate configuration take effect, you commit the changes. At this point, the candidate file is checked for proper syntax, activated, and marked as the current,

operational software configuration file. If multiple users are editing the configuration, when you commit the candidate configuration, all changes made by all the users take effect.

The CLI always maintains a copy of previously committed versions of the software configuration. If you need to return to a previous configuration, you can do this from within the CLI.

RELATED DOCUMENTATION

[Junos OS Commit Model for Configurations](#) | 50

Mapping the Name of the Router to IP Addresses

While using the Domain Name System (DNS) is an easier and more scalable way to resolve IP addresses from hostnames, you might want to manually map the hostname to a static IP address for the following reasons:

- You might not have a DNS entry for the router.
- You might not want the computer to contact the DNS server to resolve a particular IP address—you might use this particular IP address frequently, or it might be just for testing or development purposes.

To map a router's hostname to one or more IP addresses:

1. Include the **inet** statement at the **[edit system static-host-mapping hostname]** hierarchy level.

```
user@host# set system static-host-mapping hostname inet [ ip-addresses ]
```

2. Verify the configuration with the **show** command.

```
[edit system]
user@host# show
static-host-mapping {
  hostname {
    inet [ ip-addresses ];
  }
}
```

RELATED DOCUMENTATION

Example: Configuring a Proxy Server for License Updates

IN THIS SECTION

- Requirements | 74
- Overview | 74
- Configuration | 75
- Verification | 77

This example shows how to configure a proxy server to download Juniper Networks license updates.

Requirements

This example uses the following hardware and software components:

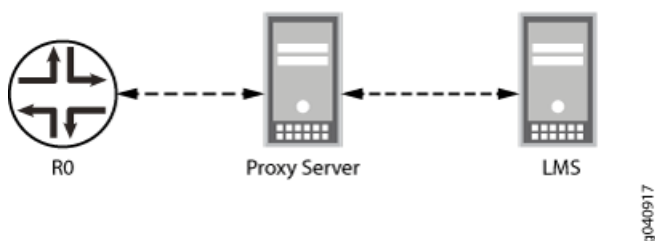
- An M Series, MX Series, PTX Series, or SRX Series device
- Junos OS Release 11.4 running on the device

Overview

In Junos OS Release 11.4 and later, you can download Juniper Networks license updates using a proxy server. This feature is supported on M Series and SRX Series devices. In earlier releases, downloading license updates was only possible by directly connecting to the [Juniper Networks License Management System](#).

In an enterprise, there might be devices in a private network that might be restricted from connecting to the Internet directly for security reasons. In such scenarios, you can configure a proxy server in the private network to connect to the LMS and download the license updates, and have the routers or devices in the private network connect to the proxy server to download the licenses or license updates. In the following illustration, R0 is the router in the private network. Proxy Server represents the proxy server, and LMS represents the Juniper Networks License Management System.

Figure 2: Proxy Server Example



To enable this feature, you configure the device with details of the proxy server at the **[edit system proxy]** hierarchy level.

Configuration

CLI Quick Configuration

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

Router R0

```

set system proxy server 192.168.1.10
set system proxy port 3128
set system proxy username user1
set system proxy password user123
set system license traceoptions file license.log
set system license traceoptions flag all
  
```

Step-by-Step Procedure

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

To configure the proxy server properties on the device:

1. Configure the proxy server IP address or hostname.

```

[edit system proxy]
user@hostR0# set server 192.168.1.10
  
```

2. Configure a port number (ranging from 0 through 65535) used to connect to the proxy server.


```
[edit system proxy]
user@hostR0# set port 3128
```

3. Configure the password as configured on the proxy server.

```
[edit system proxy]
user@R0# set password user123
```

4. Configure the username as configured on the proxy server.

```
[edit system proxy]
user@R0# set username user1
```

5. Configure trace options for licenses.

```
[edit system license]
user@R0# set traceoptions file license.log
user@R0# set traceoptions flag all
```

Results

From configuration mode, confirm your configuration by entering the **show system** command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show system
proxy {
  server 192.168.1.10;
  port 3128;
  username user1;
  password "$ABC123"; ## SECRET-DATA
}
license {
  traceoptions {
    file license.log;
    flag all;
  }
}
```

If you are done configuring the router, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly by verifying the license has been downloaded.

Confirm the License Is Downloaded

Purpose

Checking to see that the license is downloaded using the proxy server.

Action

1. Delete the existing license using the **request system license delete *license-filename*** command.
2. Download the license using the **request system license update** command.

```
user@R0> request system license update
```

```
Request to automatically update license keys from https://devicex.example.com
has been sent, use 'show system license' to check status.
```

3. Verify the license using the **show system license** command.

```
user@R0> show system license
```

```
License usage:
```

Feature name	Licenses used	Licenses installed	Licenses needed	Expiry
av_key_kaspersky_engine	0	1	0	
2011-11-17 16:00:00 PST				
idp-sig	1	1	0	
2011-11-17 16:00:00 PST				
ax411-wlan-ap	0	2	0	permanent

```

Licenses installed:
License identifier: JUNOS282725
License version: 2
Valid for device: AG2909AA0014
Features:
av_key_kaspersky_engine - Kaspersky AV
date-based, 2010-11-21 16:00:00 PST - 2011-11-17 16:00:00 PST

```

4. Check the system log file to verify that the license is downloaded using the proxy server.

```
user@R0> show /var/log/license.log
```

```

Nov 18 08:14:14 Received SIGHUP signal
Nov 18 08:14:17 GRES not enabled.
Nov 18 08:14:17 License download proxy server configured.
Nov 18 08:14:17 License download proxy server: 192.168.1.10
Nov 18 08:14:17 License download proxy server port: 3128
Nov 18 08:14:17 License download proxy user name: user1
Nov 18 08:14:17 License download proxy user password: xxx
Nov 18 08:14:18 Access configuration autoupdate url: devicex.example.com
Nov 18 08:14:18 Access configuration renew-before-expiration: 60 days
Nov 18 08:14:18 Access configuration renew-interval: 1 hours
Nov 18 08:16:53 Received SIGUSR1 signal, license download start...
Nov 18 08:16:58 env HTTP_PROXY=http://192.168.1.10/
Nov 18 08:16:58 env HTTP_PROXY_AUTH="basic*:abc:xxx"
HTTP_PROXY_AUTH="basic*:user:<password>" /usr/sbin/license_fetch -o
/tmp/license.keys.1053
'https://devicex.example.com/junos/key_retrieval?serial=AG2909AA0014=11.4I'
2> /tmp/license.status.1053
Nov 18 08:17:03 /tmp/license.keys.1053                    505 kB
505 kBps

```

RELATED DOCUMENTATION

| [proxy](#) | [151](#)

Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive

You can direct the device hard drive to automatically mirror the contents of the CompactFlash card. When you include the **mirror-flash-on-disk** statement, the hard drive 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 drive. If the CompactFlash card fails to read data, the hard drive automatically retrieves its mirrored copy of the CompactFlash card.

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

You cannot issue the **request system snapshot** command while flash-to-disk mirroring is enabled.

To configure the mirroring of the CompactFlash card to the hard drive, include the **mirror-flash-on-disk** statement at the **[edit system]** hierarchy level:

```
[edit system]
mirror-flash-on-disk;
```

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

RELATED DOCUMENTATION

[Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card | 79](#)
[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 58](#)

Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card

By default, Junos OS saves the current configuration and three previous versions of the committed configuration on the CompactFlash card. The currently operational Junos OS configuration is stored in the file **juniper.conf.gz**, and the last three committed configurations are stored in the files **juniper.conf.1.gz**, **juniper.conf.2.gz**, and **juniper.conf.3.gz**. These four files are located in the CompactFlash card in the directory **/config**.

In addition to saving the current configuration and the current operational version, you can also specify how many previous versions of the committed configurations you want stored on the CompactFlash card in the directory **/config**. The remaining previous versions of committed configurations are stored in the directory **/var/db/config** on the hard disk. This is useful when you have very large configurations that might not fit on the CompactFlash card.

To specify how many previous versions of the committed configurations you want stored on the CompactFlash card, include the **max-configurations-on-flash** statement at the **[edit system]** hierarchy level:

```
[edit system]
max-configurations-on-flash number;
```

number is a value from 0 through 49.

RELATED DOCUMENTATION

| [Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive | 78](#)

Backing Up Configurations to an Archive Site

You can configure a device to transfer its configuration to an archive file periodically. The following tasks describe how to transfer the configuration to an archive site:

1. [Configuring the Transfer of the Currently Active Configuration to an Archive Site | 80](#)
2. [Configuring the Periodic Transfer of the Active Configuration to an Archive Site | 81](#)
3. [Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed | 81](#)
4. [Configuring Archive Sites for the Transfer of Active Configuration Files | 82](#)

Configuring the Transfer of the Currently Active Configuration to an Archive Site

If you want to back up your device's current configuration to an archive site, you can configure the device to transfer its currently active configuration by FTP, HTTP, or secure copy (SCP) periodically or after each commit.

To configure the device to transfer its currently active configuration to an archive site, include statements at the **[edit system archival configuration]** hierarchy level:

```
[edit system archival configuration]
archive-sites {
  ftp://username<:password>@host-address<:port>/url-path;
  scp://username<:password>@host-address<:port>/url-path;
  http://username @host-address :url-path <password>;
```

```

}
transfer-interval interval;
transfer-on-commit;

```

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**"

Configuring the Periodic Transfer of the Active Configuration to an Archive Site

To configure the device to periodically transfer its currently active configuration to an archive site, include the **transfer-interval** statement at the **[edit system archival configuration]** hierarchy level:

```

[edit system archival configuration]
transfer-interval interval;

```

The ***interval*** is a period of time ranging from 15 through 2880 minutes.

Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed

To configure the device to transfer its currently active configuration to an archive site each time you commit a candidate configuration, include the **transfer-on-commit** statement at the **[edit system archival configuration]** hierarchy level:

```

[edit system archival configuration]
transfer-on-commit;

```

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, "**scp://username<:password>@[ipv6-host-address]<:port>/url-path**"

Configuring Archive Sites for the Transfer of Active Configuration Files

When you configure the device to transfer its configuration files, you specify an archive site to which the files are transferred. If you specify more than one archive site, the device attempts to transfer files to the first archive site in the list, moving to the next site only if the transfer fails.

When you use the **archive-sites** statement, you can specify a destination as an FTP URL, HTTP URL, or SCP-style remote file specification. The URL type **file://** is also supported.

To configure the archive site, include the **archive-sites** statement at the **[edit system archival configuration]** hierarchy level:

```
[edit system archival configuration]
archive-sites {
  ftp://username@host:<port>url-path password password;
  scp://username@host:<port>url-path password password;
  file://<path>/<filename>;
  http://username@host: url-path password password;
}
```

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, "**scp://username<:password>@[ipv6-host-address]<:port>/url-path**"

When you specify the archive site, do not add a forward slash (/) to the end of the URL.

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: Whenever configurations are made, the time included in the destination filename is either in Coordinated Universal Time (UTC) or Japan Standard Time (JST) . The default time zone on the device is UTC.

SEE ALSO

[Junos OS Commit Model for Configurations](#) | 50

Specifying the Device Physical Location

To specify the physical location of the network device, you can configure the following options for the **location** statement at the **[edit system]** hierarchy level:

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

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

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


RELATED DOCUMENTATION

| [Getting Started Guide](#)

Configuring Junos OS to Set Console and Auxiliary Port Properties

Each device has a console port and an auxiliary port for connecting terminals to the router or switch. The console port is enabled by default, and its speed is 9600 baud. The auxiliary port is disabled by default.

To configure the properties for the console and auxiliary ports, include the **ports** statement at the **[edit system]** hierarchy level:

```
[edit system]
ports {
  auxiliary {
    disable;
    insecure;
    type terminal-type;
  }
  console {
    authentication-order;
    disable;
    insecure;
    log-out-on-disconnect;
    type terminal-type;
  }
}
```

By default, the terminal type is unknown. To change the terminal type, include the **type** statement, specifying a **terminal-type** of **ansi**, **vt100**, **small-xterm**, or **xterm**. The first three terminal types set a screen size of 80 columns by 24 lines. The last type, **xterm**, sets the size to 80 columns by 65 rows.

By default, the console session is not logged out when the data carrier is lost on the console modem control lines. To change this default and log out the session automatically when the data carrier on the console port is lost, include the **log-out-on-disconnect** statement. You can use the **show system users** command to verify the console session is logged out.

NOTE: The **log-out-on-disconnect** statement is not operational on MX80 routers. On MX80 routers you must manually log out from the console with the **request system logout u0** command.

By default, terminal connections to the console and auxiliary ports are secure. When you configure the console as insecure, root logins are not allowed to establish terminal connections. In addition, superusers and anyone with a user identifier (UID) of 0 are not allowed to establish terminal connections in multiuser mode when you configure the console as insecure. To disable root login connections to the console and auxiliary ports, include the **insecure** statement. This option can be used to prevent someone from attempting password recovery by booting into single-user mode, if they do not know the root password.

To disable console login, include the **disable** statement. By default, console login is enabled.

NOTE: For Common Criteria compliance, the console port must be disabled.

RELATED DOCUMENTATION

[Methods for Configuring Junos OS | 46](#)

[console](#)

[ports | 147](#)

Configuring a Device's Unique Identity for the Network

IN THIS SECTION

- [Requirements | 86](#)
- [Overview | 86](#)
- [Configuration | 87](#)
- [Verification | 88](#)

To use a device in a network, you must configure the device's identity. Doing this makes the device 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
- Use the Domain Name System (DNS) to resolve an IP address from a hostname
- Manually map the hostname to a static IP address

Although using 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. In this latter instance, perhaps you use this particular IP address frequently, 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 some or all of the following details: The hostname of the router, its IP address, the domain name, and IP addresses for two or three domain name servers.

Requirements

No special configuration beyond device initialization is required.

Overview

In this context, the hostname is the device'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 also use the hostname to telnet to a device.

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*—for example, "Juniper.net."

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

The values given in the following table are used to configure each of these variables. You need to substitute data specific to your device and network for these values.

Table 7: 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	

Table 7: Values to Use in Example (*continued*)

Name of Variable	Value Used in Example	Value You Substitute
<code>name-server <i>ip-address</i></code>	<code>name-server 172.24.16.115</code> <code>name-server 192.0.2.0</code>	

Configuration

CLI Quick Configuration

To quickly configure a device using this example

- Copy the following commands and paste them in a text file
- Remove any line breaks
- Change the values listed here to match your network configuration
- Copy and paste the commands into the CLI at the **[edit]** hierarchy level
- Finally, 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

Confirm the Device Hostname and IP Address

Purpose

Confirm the hostname and IP address of a device are as expected.

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

Configuring a DNS Name Server for Resolving Hostnames into Addresses

Monitoring Junos Devices

IN THIS CHAPTER

- [Junos OS Tools for Monitoring | 91](#)
- [Tracing and Logging Junos OS Operations | 92](#)
- [Understanding Dropped Packets and Untransmitted Traffic Using show Commands | 94](#)
- [Log a User Out of the Device | 98](#)

Junos OS Tools for Monitoring

The primary method of monitoring and troubleshooting Junos OS, routing protocols, network connectivity, and the device hardware is to enter commands from the CLI. The CLI enables you to display information in the routing tables and routing protocol-specific data, and to check network connectivity using **ping** and **traceroute** commands.

The J-Web GUI is a Web-based alternative to using CLI commands to monitor, troubleshoot, and manage the device.

Junos OS includes SNMP software, which enables you to manage routers. The SNMP software consists of an SNMP master agent and a MIB II agent, and supports MIB II SNMP version 1 traps and version 2 notifications, SNMP version 1 **Get** and **GetNext** requests, and version 2 **GetBulk** requests.

The software also supports tracing and logging operations so that you can track events that occur—both normal device operations and error conditions—and track the packets that are generated by or pass through the device. Logging operations use a syslog-like mechanism to record system-wide, high-level operations, such as interfaces going up or down and users logging in to or out of the device. Tracing operations record more detailed messages about the operation of routing protocols, such as the various types of routing protocol packets sent and received, and routing policy actions.

RELATED DOCUMENTATION

[Methods for Configuring Junos OS | 46](#)

[Junos OS Features for Router Security | 39](#)

Tracing and Logging Junos OS Operations

Tracing and logging operations allow you to track events that occur in the device—both normal operations and error conditions—and to track the packets that are generated by or passed through the device. The results of tracing and logging operations are placed in files in the `/var/log` directory.

Junos OS provides an option to do remote tracing for specific processes, which greatly reduces use of device internal storage for tracing and is analogous to remote system logging. You configure remote tracing system-wide using the **tracing** statement at the **[edit system]** hierarchy level. By default, remote tracing is not configured. You can disable remote tracing for specific processes using the **no-remote-trace** statement at the **[edit process-name traceoptions]** hierarchy level. This feature does not alter local tracing functionality in any way, and logging files are stored on the device.

Junos OS supports remote tracing for the following processes:

- **chassisd**—Chassis-control process
- **eventd**—Event-processing process
- **cosd**—Class-of-service process
- **spd**—Adaptive-services process

Logging operations use a system logging mechanism similar to the UNIX `syslogd` utility to record system-wide, high-level operations, such as interfaces going up or down and users logging in to or out of the device. You configure these operations by using the **syslog** statement at the **[edit system]** hierarchy level, as described in *Junos OS System Log Overview*, and by using the **options** statement at the **[edit routing-options]** hierarchy level, as described in the *Junos OS Routing Protocols Library*.

Tracing operations record more detailed messages about the operation of routing protocols, such as the various types of routing protocol packets sent and received, and routing policy actions. You configure tracing operations using the **traceoptions** statement. You can define tracing operations in different portions of the router configuration:

- **Global tracing operations:** Define tracing for all routing protocols. You define these tracing operations at the **[edit routing-options]** hierarchy level of the configuration.
- **Protocol-specific tracing operations:** Define tracing for a specific routing protocol. You define these tracing operations in the **[edit protocol]** hierarchy when configuring the individual routing protocol. Protocol-specific tracing operations override any equivalent operations that you specify in the global **traceoptions** statement. If there are no equivalent operations, they supplement the global tracing options. If you do not specify any protocol-specific tracing, the routing protocol inherits all the global tracing operations.
- **Tracing operations within individual routing protocol entities:** Some protocols allow you to define more granular tracing operations. For example, in Border Gateway Protocol (BGP), you can configure peer-specific tracing operations. These operations override any equivalent BGP-wide operations or, if

there are no equivalents, supplement them. If you do not specify any peer-specific tracing operations, the peers inherit, first, all the BGP-wide tracing operations and, second, the global tracing operations.

- Interface tracing operations: Define tracing for individual router interfaces and for the interface process itself. You define these tracing operations at the **[edit interfaces]** hierarchy level of the configuration as described in the *Junos OS Network Interfaces Library for Routing Devices*.
- Remote tracing—To enable system-wide remote tracing, include the **destination-override syslog host** statement at the **[edit system tracing]** hierarchy level. This specifies the remote host running the system log process (syslogd), which collects the traces. Traces are written to file(s) on the remote host per the syslogd configuration in */etc/syslog.conf*. By default remote tracing is *not* configured.

To override the system-wide remote tracing configuration for a particular process, include the **no-remote-trace** statement at the **[edit process-name traceoptions]** hierarchy. When **no-remote-trace** is enabled, the process does local tracing.

NOTE: When remote tracing is configured, traces will go to the remote host.

To collect traces, use the **local0** facility as the selector in */etc/syslog.conf* on the remote host. To separate traces from various processes into different files, include the process name or trace-file name if it is specified at the **[edit process-name traceoptions file]** hierarchy level, in the Program field in */etc/syslog.conf*. If your syslog server supports parsing hostname and program name, then you can separate traces from the various processes.

RELATED DOCUMENTATION

Junos OS Network Interfaces Library for Routing Devices

Junos OS Routing Protocols Library

Junos OS System Log Overview

Understanding Dropped Packets and Untransmitted Traffic Using show Commands

Starting with Junos OS Release 14.2, packets that need to be forwarded to the adjacent network element or a neighboring device along a routing path might be dropped by a device owing to several factors. Some of the causes for such a loss of traffic or a block in transmission of data packets include overloaded system conditions, profiles and policies that restrict the bandwidth or priority of traffic, network outages, or disruption with physical cable faults. You can use a number of show commands to determine and analyze the statistical counters and metrics related to any traffic loss and take an appropriate corrective measure. The fields displayed in the output of the show commands help in diagnosing and debugging network performance and traffic-handling efficiency problems.

The following **show** commands and associated fields applicable for dropped packets enable you to view and analyze some of the system parameters for errors or disruption in transmitted packets.

show interfaces extensive—Display input and output packet errors or drops. Following are some of the **show interfaces extensive** input counters and their definitions.

Errors—Sum of the incoming frame aborts and FCS errors.

Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism.

Framing errors—Number of packets received with an invalid frame checksum (FCS).

Runts—Number of frames received that are smaller than the runt threshold.

Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the Junos OS does not handle.

L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. L3 incomplete errors can be ignored by configuring the **ignore-l3-incompletes** statement.

L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame.

L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.

FIFO errors—Number of FIFO errors in the receive direction that are reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning.

Resource errors—Sum of transmit drops.

Following are definitions for some of the output counters for **show interfaces extensive**:

Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning.

Errors—Sum of the outgoing frame aborts and FCS errors.

Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism.

Collisions—Number of Ethernet collisions. The Gigabit Ethernet PIC supports only full-duplex operation, so for Gigabit Ethernet PICs, this number should always remain 0. If it is nonzero, there is a software bug.

Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware.

FIFO errors—Number of FIFO errors in the send direction as reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning.

HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.

MTU errors—Number of packets whose size exceeded the MTU of the interface.

Resource errors—Sum of transmit drops.

Following are definitions for some of the Queue counters for **show interfaces extensive** (both outbound and inbound). This includes CoS queue number and its associated user-configured forwarding class name, and is displayed on IQ2 interfaces.

Queued packets—Number of queued packets.

Transmitted packets—Number of transmitted packets.

Dropped packets—Number of packets dropped by the ASIC's RED mechanism.

show interfaces queue—Display class-of-service (CoS) queue information for physical interfaces. Following are some of the **show interfaces queue** output fields and their definitions.

Queued packets—Number of queued packets.

Transmitted packets—Number of transmitted packets.

Dropped packets—Number of packets dropped by the ASIC's RED mechanism.

Tail-dropped packets—Number of packets dropped because of tail drop.

RL-dropped packets—Number of packets dropped due to rate limiting. For rate-limited interfaces hosted on MICs, MPCs, and Enhanced Queuing DPCs only, this statistic is not included in the queued traffic statistics.

RED-dropped packets—Number of packets dropped because of random early detection (RED).

On M320 and M120 routers and most T Series routers, just the total number of dropped packets is displayed. For other M Series routers, as well as MX Series routers with enhanced DPCs, T Series routers with enhanced FPCs, and all J Series routers, the output classifies dropped packets into the following categories:

- **Low, non-TCP**—Number of low-loss priority non-TCP bytes dropped because of RED.
- **Low, TCP**—Number of low-loss priority TCP packets dropped because of RED.
- **High, non-TCP**—Number of high-loss priority non-TCP packets dropped because of RED.
- **High, TCP**—Number of high-loss priority TCP packets dropped because of RED.

show class-of-service fabric statistics summary—Display class-of-service (CoS) switch fabric queue drop statistics. Following are the fabric queue statistics for dropped traffic:

Packets—Dropped packet count for high-priority and low-priority queues.

Bytes—Dropped byte count for high-priority and low-priority queues.

pps—Dropped packets-per-second count for high-priority and low-priority queues.

bps—Dropped bits-per-second count for high-priority and low-priority queues.

show pfe statistics traffic fpc—Display packet drops related to the entire FPC. Following are the FPC-level statistics for Packet Forwarding Engine hardware discards:

Timeout—Number of packets discarded because of timeouts.

Truncated key—Number of packets discarded because of truncated keys.

Bits to test—Number of bits to test.

Data error—Number of packets discarded because of data errors.

Stack underflow—Number of packets discarded because of stack underflows.

Normal discard—Number of packets discarded because of discard routes. Packets are dropped silently without being further processed by the host. Normal discards are reported when packets match a firewall filter term that has an action of discard or when the final result of the route look-up is a next hop of discard.

Extended discard—Number of packets discarded because of illegal next hops. Packets are dropped silently but are also sent to the Routing Engine for further processing. Extended discards are reported when

packets match a firewall filter term that has an action of discard and an additional action that requires Routing Engine processing, such as log, count, sample, or syslog.

Invalid interface—Number of packets discarded because of invalid incoming interfaces.

Info cell drops—Number of information cell drops.

Fabric drops—Number of fabric drops.

The following statistics are related to Packet Forwarding Engine local traffic for **show pfe statistics traffic fpc**:

Local packets input—Number of incoming packets from the local network.

Local packets output—Number of outgoing packets dispatched to a host in the local network.

Software input high drops—Number of incoming software packets of high-priority, dropped during transmission.

Software input medium drops—Number of incoming software packets of medium-priority, dropped during transmission.

Software input low drops—Number of incoming software packets of low-priority, dropped during transmission.

Software output drops—Number of outgoing software packets that were dropped during transmission.

Hardware input drops—Number of incoming hardware packets that were dropped during transmission.

The preceding commands represent only the main parameters that you can use to identify and monitor traffic drops or errors. Depending on your specific deployment scenario and network conditions, you might need to view the output of other relevant **show** commands to evaluate different factors that might be resulting in traffic transmission losses.

RELATED DOCUMENTATION

show interfaces extensive

show interfaces queue

show pfe statistics traffic

show class-of-service fabric statistics

Log a User Out of the Device

Sometimes you may need to disconnect a user session if it does not terminate after a user logs out, or you may otherwise want to log a user out for some other reason.

To log a user out of all terminal sessions on a router, enter the following Junos OS CLI command:

```
user@host> request system logout username
```

```
user@host> show system users
```

```
10:07PM up 13 days, 1:25, 2 users, load averages: 0.17, 0.05, 0.02
USER      TTY      FROM              LOGIN@   IDLE WHAT
harry     p0       hpot-lt.cmpy.net  10:07PM        - -cli (cl
lisa      p1       hpot-lt.cmpy.net  10:06PM        - -cli (cl
```

```
user@host> request system logout user harry
```

```
user@host> show system users
```

```
10:07PM up 13 days, 1:25, 1 user, load averages: 0.24, 0.06, 0.02
USER      TTY      FROM              LOGIN@   IDLE WHAT
lisa      p1       hpot-lt.cmpy.net  10:06PM        - -cli (cl
```

The sample output for the first **show system users** command shows there were two users on the router, harry and lisa. The **request system logout user** command was issued to log out user harry. Because there is no output to indicate that harry was logged out, the **show system users** command was issued again to verify that user harry was actually logged out of the router, while the user lisa remains logged in.

Managing Junos OS Processes

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- Viewing Core Files from Junos OS Processes | 100
- Disabling Junos OS Processes | 101
- Configuring Failover to Backup Media If a Junos OS Process Fails | 101
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- Using Virtual Memory for Process Configuration Data | 103
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Saving Core Files from Junos OS Processes

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

To disable the saving of core files and associated context information, include the **no-saved-core-context** statement at the **[edit system]** hierarchy level:

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

To save the core files only, include the **saved-core-files** statement at the **[edit system]** hierarchy level and specify the number of files to save:

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

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

To save the core files along with the contextual information, include the **saved-core-context** statement at the **[edit system]** hierarchy level:

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

RELATED DOCUMENTATION

[saved-core-context | 158](#)

[saved-core-files | 159](#)

[Viewing Core Files from Junos OS Processes | 100](#)

Viewing Core Files from Junos OS Processes

When an internal Junos OS process generates a core file, you can find the output at **/var/crash/** and **/var/tmp/**. For Junos OS Evolved, you can find the output core files at **/var/core/** for Routing Engine core files and **/var/lib/ftp/in/** for FPC core files. Using these directories provides a quick method of finding core issues across large networks.

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

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

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

RELATED DOCUMENTATION

show system core-dumps

[Saving Core Files from Junos OS Processes | 99](#)

Disabling Junos OS Processes



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

To disable a software process, specify the appropriate option in the **processes** statement at the **[edit system]** hierarchy level:

```
[edit system]
processes {
    process-name (enable | disable);
}
```

NOTE: The **process-name** variable is one of the valid process names. You can obtain a complete list of process names by using the CLI command completion feature.

RELATED DOCUMENTATION

[processes | 149](#)

[Configuring Failover to Backup Media If a Junos OS Process Fails | 101](#)

[Viewing Core Files from Junos OS Processes | 100](#)

Configuring Failover to Backup Media If a Junos OS Process Fails

For network devices with redundant Routing Engines, you can configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly. You can configure the device to fail over either to backup media or to the other Routing Engine. To configure automatic switchover to backup media if a software process fails, include the **failover** statement at the **[edit system processes process-name]** hierarchy level:

```
[edit system processes]
process-name failover (alternate-media | other-routing-engine);
```

The value for ***process-name*** should be one of the valid process names. If this statement is configured for a process, and that process fails four times within 30 seconds, the device reboots from either the alternative media or the other Routing Engine.

RELATED DOCUMENTATION

[Disabling Junos OS Processes | 101](#)

[Saving Core Files from Junos OS Processes | 99](#)

[processes | 149](#)

Using the AgentD Process for Exporting Data to the Routing Engine

The agent process is a control plane process known as AgentD. This AgentD process interfaces with the Junos OS CLI to configure sensors and streaming servers, and to export profiles that are present in the Packet Forwarding Engine. The data pertaining to sensors is in turn exported as a JRF (Java Required Files format) file at the configured intervals to the streaming servers from Packet Forwarding Engine. AgentD can intercept the data sent out from the Packet Forwarding Engine to prevent the Routing Engine processes or daemons from querying the Packet Forwarding Engine.

This data is exported by AgentD from the Packet Forwarding Engine to the Routing Engine. A historical snapshot of this data collected is maintained in the Routing Engine. A limit on the number of records of the sensor data that is saved in the Routing Engine exists.

NOTE: The AgentD control plane process was introduced beginning with Junos OS Release 14.2.

The following operations occur during the export of data to the Routing Engine using AgentD:

1. AgentD listens on port 2000 for messages from the Packet Forwarding Engine. Data can be received at the Routing Engine by configuring the IP address of one of the streaming servers as the Routing Engine IP address fxp0 and port 2000.
2. The data is sent by Packet Forwarding Engine in JRF format.
3. AgentD maintains the sensor data history in a Berkeley-format database (***/var/run/agentd.db***). AgentD database has tables based on sensor types. Because CPU, NPU, and interface sensor types are supported, a total of three tables are created.
4. It is possible to maintain a history of maximum 50 records for each table in the database. The number of records is configured using a hidden statement.

NOTE: We recommend that you use the hidden statement to configure the limit on the number of records of sensor data that is exported by AgentD only with the assistance of a Juniper Technical Assistance Center representative.

5. After the sensor data arrives at the Routing Engine, AgentD decodes the header to find sensor type to write the data into the respective table. It determines the sensor ID, FPC slot, Packet Forwarding Engine ID, and retrieves the current timestamp. This 4-tuple value becomes the key for the table. The entire message along with the header is written to the database table.
6. When a fresh record needs to be written to the table, the maximum limit for number of records, if configured, is examined. If the limit is exceeded, the oldest entry is purged from the table to insert the fresh record.

Using Virtual Memory for Process Configuration Data

Configuration data for each process in Junos OS is stored in memory that is mapped within the address space of each process, requiring a fixed maximum space to be reserved in each process. Typically, the maximum database size available is 680 MB for the i386 platform and 238 MB for other platforms. This scheme works well until a process is managing many functions at commit time and negatively impacts the commit time, or simply needs more memory than the default allotment. For example, the **rp**d process might be managing many routes and require more space to store important information about the routes.

In circumstances that require more than the maximum memory-mapped size, you can use **virtual-memory-mapping** at the **[edit system configuration-database]** hierarchy level to make more memory available for the configuration database per process.

You can configure a portion of virtual memory at a fixed size for the initial portion of the configuration database, and you can specify an amount to be used for page-pooling. Page-pooling uses a small amount of memory to bring database pages into memory as needed, rather than mapping the entire configuration database into the virtual memory space for the process.

For i386 platforms on the M Series, MX Series, and T Series devices only, you can also extend the configuration database size from a maximum of 680 MB to 1.5 GB.

RELATED DOCUMENTATION

[Example: Configuring Virtual Memory for Process Configuration Data](#) | 104

Example: Configuring Virtual Memory for Process Configuration Data

IN THIS SECTION

- [Requirements | 104](#)
- [Overview | 104](#)
- [Configuration | 105](#)

This example shows how to use **virtual-memory-mapping** to configure different fixed and page-pooling sizes for the configuration database for individual processes in Junos OS.

Requirements

This example uses the following hardware and software components:

- A Juniper Networks M Series, MX Series, PTX Series, or T Series router
- Junos OS Release 13.2 or later

Overview

Typically, the maximum database size available for storing configuration data per process is 665.99 MB for M, MX, PTX, and T i386 platforms, with certain devices such as the PTX1000 Packet Transport Router having a maximum database size of 409.99 MB. The database size is mapped within the address space reserved for that process. Depending on the process, this database size might impact commit performance for a process that manages many changes at commit.

To improve commit performance, you can use **virtual-memory-mapping** at the **[edit system configuration-database]** hierarchy level to allocate virtual memory for storing process configuration data on a per-process basis. You can configure a portion of the virtual memory as fixed size and a portion for page-pooling. Page-pooling uses just a small amount of memory to swap pages in or out as needed, rather than mapping the entire configuration database at once.

Using **virtual-memory-mapping** and enabling page-pooling are methods used to improve commit performance for processes that manage many changes at commit time that negatively impact commit performance.

Additionally, for M, MX, PTX, and T i386 systems, the option **extend-size** is available at the **[edit system configuration-database]** hierarchy level to increase the configuration database size, improving commit performance for **mgd**. The extended default size is based on the original default database size. A device

with a default database size of 409.99 MB will extend to a maximum of 1049.99 MB, and a device with a default database size of 665.99 MB will extend to a maximum of 1305.99. The extended size will automatically be used by **mgd**. Other processes will only be able to access the increased size by using page-pooling. The **extend-size** option is not available on MX80, MX40, MX10, or MX5 platforms.

The configurations provided here are only examples. The sizes and processes that you configure will be different depending on the needs of your system.

Syntax

The syntax structure used in this example is available in Junos OS Release 13.2 or later.

```
system {
  configuration-database {
    virtual-memory-mapping {
      process process name {
        fixed-size size KB;
        page-pooling-size size KB;
      }
    }
    extend-size;
  }
}
```

Configuration

IN THIS SECTION

- [Configuring Virtual Memory Parameters for a Single Process | 105](#)
- [Configuring Virtual Memory Parameters for Multiple Processes | 106](#)
- [Configuring Extended Size for the Configuration Database | 107](#)

Configuring Virtual Memory Parameters for a Single Process

Step-by-Step Procedure

This example sets parameters of 512 KB for the fixed size and 512 KB for the page-pooling size of virtual memory mapping for the interface-control process, which controls the router's physical interface devices and logical interfaces.

We assume the interface-control process on this sample system manages so many changes at commit time that performance is impacted. After completing this configuration on this system, we can expect improvement in the commit time performance.

1. Set the virtual memory fixed size to 512 KB and the page-pooling size to 512 KB for the interface-control process.

```
[edit]
user@host# set system configuration-database virtual-memory-mapping process interface-control fixed-size
512 page-pooling 512
```

2. Commit the changes.

```
user@host# commit
```

Results

Verify the setup using the **show system configuration-database usage** command.

NOTE: Prior to Junos OS Release 15.1, use the **show system configuration database** operational mode command instead to view the usage statistics of configuration database memory.

Configuring Virtual Memory Parameters for Multiple Processes

Step-by-Step Procedure

You can configure virtual memory parameters for configuration data for more than one process on a single system. This example configures parameters to enable page-pooling for the processes: interface-control, mib-process, firewall, event-processing, vrrp, and snmp.

1. Set the fixed-size to 20480 and set the page-pooling size to 30720 for the interface-control process.

```
user@host# set system configuration-database virtual-memory-mapping process interface-control fixed-size
20480 page-pooling 30720
```

2. Set the fixed-size to 512 and set the page-pooling size to 30720 for the mib-process.

```
user@host# set system configuration-database virtual-memory-mapping process mib-process fixed-size  
512 page-pooling 30720
```

3. Set the fixed-size to 30720 and set the page-pooling size to 1024 for the firewall process.

```
user@host# set system configuration-database virtual-memory-mapping process firewall 30720 page-pooling  
1024
```

4. Set the fixed-size to 10240 and set the page-pooling size to 10240 for the snmp process.

```
user@host# set system configuration-database virtual-memory-mapping process snmp fixed-size 10240  
page-pooling 10240
```

5. Commit the changes.

```
user@host# commit
```

Results

Verify the setup using the **show system configuration-database usage** command.

NOTE: Prior to Junos OS Release 15.1, use the **show system configuration database** operational mode command instead to view the usage statistics of configuration database memory.

Configuring Extended Size for the Configuration Database

Step-by-Step Procedure

This example increases the configuration database size available to **mgd** and other processes on i386 versions of M Series, MX Series, PTX Series, or T Series platforms. Devices with a default database size of 409.99 MB will extend to a maximum of 1049.99 MB, and devices with a default database size of 665.99 MB will extend to a maximum of 1305.99.

NOTE: This feature is only available on i386 platforms, and **mgd** automatically uses the increased database size. To make the extended memory available for other processes, enable page-pooling-size under virtual-memory-mapping. The **extend-size** option is not available on MX80, MX40, MX10, or MX5 platforms.

1. Extend the configuration database size.

```
[edit]
user@host# set system configuration-database extend-size
```

2. Commit the changes.

```
user@host# commit
```

Results

Verify the setup using the **show system configuration-database usage** command.

NOTE: Prior to Junos OS Release 15.1, use the **show system configuration database** operational mode command instead to view the usage statistics of configuration database memory.

RELATED DOCUMENTATION

[Using Virtual Memory for Process Configuration Data | 103](#)

[show system configuration database usage | 327](#)

Improving Commit Time When Using Configuration Groups

Configuration groups are used for applying configurations across other hierarchies without re-entering configuration data. Some configuration groups specify every configuration detail. Other configuration groups make use of wildcards to configure ranges of data, without detailing each configuration line. Some configurations have an inheritance path that includes a long string of configurations to be applied.

When a configuration that uses configuration groups is committed, the commit process expands and reads all the configuration data of the group into memory to apply the configurations as intended. The commit performance can be negatively impacted if many configuration groups are being applied, especially if the configuration groups use wildcards extensively.

If your system uses many configuration groups that use wildcards, you can configure the **`persist-groups-inheritance`** statement at the **`[edit system commit]`** hierarchy level to improve commit time performance.

Using this option allows the system to build the inheritance path for each configuration group inside the database, rather than in the process memory. This can improve commit time performance. However, it can also increase the database size by up to 22 percent.

3

PART

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System Management Configuration Statements

This topic lists all the configuration statements that you can include at the **[edit system]** hierarchy level to configure system management features:

```
system {
  accounting {
    destination {
      radius {
        server {
          server-address {
            accounting-port port-number;
            retry number;
            secret password;
            source-address address;
            timeout seconds;
          }
        }
      }
    }
    tacplus {
      server {
        server-address {
          port port-number;
          secret password;
          single-connection;
          timeout seconds;
        }
      }
    }
  }
  enhanced-avs-max;
  events [ login change-log interactive-commands ];
}
archival {
  configuration {
    archive-sites {
```

```

        ftp://<username>:<password>@<host>:<port>/<url-path>;
        ftp://<username>:<password>@<host>:<port>/<url-path>;
    }
    transfer-interval interval;
    transfer-on-commit;
}
}
allow-v4mapped-packets;
arp {
    aging-timer minutes;
    gratuitous-arp-delay;
    gratuitous-arp-on-ifup;
    interfaces;
    passive-learning;
    purging;
}
authentication-order [ authentication-methods ];
backup-router address <destination destination-address>;
commit {
    delta-export;
    fast-synchronize;
    persist-groups-inheritance ;
    server;
    synchronize
}
synchronize;
(compress-configuration-files | no-compress-configuration-files);
default-address-selection;
diag-port-authentication (encrypted-password "password" | plain-text-password);
dynamic-profile-options {
    versioning;
}
domain-name domain-name;
domain-search [ domain-list ];
fips {
    level level;
}
host-name hostname;
inet6-backup-router address <destination destination-address>;
internet-options {
    tcp-mss mss-value;
    (gre-path-mtu-discovery | no-gre-path-mtu-discovery);
    icmpv4-rate-limit bucket-size bucket-size packet-rate packet-rate;
    icmpv6-rate-limit bucket-size bucket-size packet-rate packet-rate;
}

```

```

(ipip-path-mtu-discovery | no-ipip-path-mtu-discovery);
(ipv6-path-mtu-discovery | no-ipv6-path-mtu-discovery);
ipv6-path-mtu-discovery-timeout;
no-tcp-rfc1323-paws;
no-tcp-rfc1323;
(path-mtu-discovery | no-path-mtu-discovery);
source-port upper-limit <upper-limit>;
(source-quench | no-source-quench);
tcp-drop-synfin-set;
}
location {
    altitude feet;
    building name;
    country-code code;
    floor number;
    hcoord horizontal-coordinate;
    lata service-area;
    latitude degrees;
    longitude degrees;
    npa-nxx number;
    postal-code postal-code;
    rack number;
    vcoord vertical-coordinate;
}
login {
    announcement text;
    class class-name {
        allow-hidden-commands;
        no-hidden-commands {
            except ["regular expression or command 1" "regular expression or command 2" ...];
        }
        access-end hh:mm;
        access-start hh:mm;
        allow-commands "regular-expression";
        allow-commands-regexps [ "regular expression 1" "regular expression 2" ... ];
        ( allow-configuration | allow-configuration-regexps ) "regular expression 1" "regular expression 2";
        allow-sources [ allow-sources ... ];
        allow-times [ allow-times ... ];
        allowed-days (days-of-the-week);
        cli {
            prompt prompt;
        }
        configuration-breadcrumbs;
        confirm-commands ["regular expression or command 1" "regular expression or command 2" ...] {

```

```

        confirmation-message;
    }
    deny-commands "regular-expression";
    deny-commands-regexps [ "regular expression 1" "regular expression 2 " ... ];
    ( deny-configuration | deny-configuration-regexps ) "regular expression 1" "regular expression 2 ";
    deny-sources [ deny-sources ... ];
    deny-times [ deny-times ... ];
    idle-timeout;
    logical-system logical-system-name;
    login-alarms;
    login-script filename;
    login-tip;
    no-scp-server;
    no-sftp-server;
    permissions [ permissions ];
    satellite all;
    security-role (audit-administrator | crypto-administrator | ids-administrator | security-administrator);
    tenant tenant-system-name;
}
message text;
password {
    change-type (set-transitions | character-set);
    format (md5 | sha1 | des);
    maximum-length length;
    minimum-changes number;
    minimum-length length;
}
retry-options {
    backoff-threshold number;
    backoff-factor seconds;
    minimum-time seconds;
    tries-before-disconnect number;
}
user username {
    class class-name;
    cli {
        prompt prompt;
    }
    full-name full-name;
    uid uid-value;
    authentication {
        encrypted-password "encrypted-password";
        ssh-ecdsa name {
            from from;

```



```

    }
    ssh-ed25519 name {
        from from;
    }
    ssh-rsa name {
        from from;
    }
}
}
}
mirror-flash-on-disk;
name-server {
    address;
}
no-multicast-echo;
no-redirects;
no-ping-record-route;
no-ping-time-stamp;
ntp {
    authentication-keykey-number type type value password;
    boot-server address;
    broadcast <address> <key key-number> <version value> <ttd value>;
    broadcast-client;
    multicast-client <address>;
    peer address <key key-number> <version value> <prefer>;
    source-address source-address;
    server address <key key-number> <version value> <prefer>;
    trusted-key [ key-numbers ];
}
ports {
    auxiliary {
        type terminal-type;
    }
    pic-console-authentication {
        encrypted-password encrypted-password;
        plain-text-password;
        console {
            insecure;
            log-out-on-disconnect;
            type terminal-type;
            disable;
        }
    }
}
processes {

```

```

    process--name (enable | disable) failover (alternate-media | other-routing-engine);
    timeout seconds;
}
}
radius-server server-address {
    accounting-port port-number;
    port port-number;
    retry number;
    secret password;
    source-address source-address;
    timeout seconds;
}
radius-options {
    enhanced-accounting
    password-protocol mschap-v2;
}
attributes {
    nas-ip-address ip-address;
}
enhanced-accounting;
password-protocol mschap-v2;
}
root-authentication {
    (encrypted-password "password" | plain-text-password);
    ssh-rsa "public-key";
    ssh-dsa "public-key";
}
(saved-core-context | no-saved-core-context);
saved-core-files saved-core-files;
scripts {
    commit {
        allow-transients;
        file filename {
            optional;
            refresh;
            refresh-from url;
            source url;
        }
        traceoptions {
            file <filename> <files number> <size size> <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
        }
    }
    op {

```

```

file filename {
    arguments {
        argument-name {
            description descriptive-text;
        }
    }
    command filename-alias;
    description descriptive-text;
    refresh;
    refresh-from url;
    source url;
}
refresh;
refresh-from url;
traceoptions {
    file <filename> <files number> <size size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
}
}
}
services {
    finger {
        connection-limit limit;
        rate-limit limit;
    }
    flow-tap-dtcp {
        ssh {
            connection-limit limit;
            rate-limit limit;
        }
    }
    ftp {
        connection-limit limit;
        rate-limit limit;
    }
    rest {
        control {
            allowed-sources [ value-list ];
            connection-limit limit;
        }
        enable-explorer;
        http {
            addresses [ addresses ];

```

```

    port port-number;
  }
  https {
    addresses [ addresses ];
    cipher-list [ cipher-1 cipher-2 cipher-3 ... ];
    mutual-authentication {
      certificate-authority certificate-authority-profile-name;
    }
    port port-number;
    server-certificate local-certificate-identifier;
  }
  traceoptions {
    flag flag;
  }
}
service-deployment {
  servers server-address {
    port port-number;
  }
  source-address source-address;
}
ssh {
  root-login (allow | deny | deny-password);
  protocol-version [v1 v2];
  connection-limit limit;
  rate-limit limit;
}
telnet {
  connection-limit limit;
  rate-limit limit;
}
web-management {
  http {
    interfaces [ interface-names ];
    port port;
  }
  https {
    interfaces [ interface-names ];
    local-certificate name;
    port port;
  }
}
session {
  idle-timeout [ minutes ];
  session-limit [ session-limit ];
}

```

```

    }
}
xnm-clear-text {
    connection-limit limit;
    rate-limit limit;
}
xnm-ssl {
    connection-limit limit;
    local-certificate name;
    rate-limit limit;
}
}
static-host-mapping {
    hostname {
        alias [ alias ];
        inet [ address ];
        sysid system-identifier;
    }
}
syslog {
    archive <files number> <size size> <world-readable | no-world-readable>;
    console {
        facility severity;
    }
    file filename {
        facility severity;
        archive <archive-sites {ftp-url <password password>}> <files number> <size size>
            <start-time "YYYY-MM-DD.hh:mm"> <transfer-interval minutes> <world-readable | no-world-readable>;
        explicit-priority;
        match "regular-expression";
        match-strings string-name;
        structured-data {
            brief;
        }
    }
}
host (hostname | other-routing-engine | scc-master) {
    facility severity;
    explicit-priority;
    facility-override facility;
    log-prefix string;
    match "regular-expression";
    match-strings string-name;
    source-address source-address;
    structured-data {

```

```

        brief;
    }
}
source-address source-address;
time-format (year | millisecond | year millisecond);
user (username | *) {
    facility severity;
    match "regular-expression";
    match-strings string-name;
}
}
tacplus-options {
    enhanced-accounting;
    service-name service-name;
    (no-cmd-attribute-value | exclude-cmd-attribute);
}
tacplus-server server-address {
    secret password;
    single-connection;
    source-address source-address;
    timeout seconds;
}
time-zone (GMThour-offset | time-zone);
}
tracing {
    destination-override {
        syslog host;
    }
}
use-imported-time-zones;
}

```

announcement

Syntax

```
announcement text;
```

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

Configuring Junos OS to Display a System Login Announcement

[message](#) | **140**

backup-router

Syntax

```
backup-router address <destination destination-address>;
```

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

address—Address of the default router.

destination destination-address—(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.

Default: All hosts (default route) are reachable through the backup router.

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

Configuring a Backup Router

[System Management Configuration Statements](#) | 114

commit (System)

Syntax

```
commit {  
  commit-synchronize-server;  
  delta-export;  
  fast-synchronize;  
  notification;  
  peers;  
  peers-synchronize;  
  persist-groups-inheritance | no-persist-groups-inheritance;  
  server;  
  synchronize;  
}
```

The parameters for fast-synchronize and synchronize do not apply for the SRX Series.

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced in Junos OS Release 7.4.

Option **persist-groups-inheritance** added in Junos OS Release 13.2.

Option **delta-export** added in Junos OS Release 14.2.

Option **peers** added in Junos OS Release 14.2R6.

Option **peers-synchronize** added in Junos OS Release 14.2R6.

Option **no-persist-groups-inheritance** added in Junos OS Evolved Release 19.2R1 and Junos OS Release 19.4R1.

Description

Configure options for Junos OS commit.

Options

commit-synchronize-server—(Optional) Specify traceoptions for commit synchronize server actions.

delta-export—(Optional) Configure system commit to export only the changes made in the candidate configuration instead of exporting the entire candidate configuration to the configuration database. This helps to reduce the time taken to commit the configuration changes..

fast-synchronize—(Optional) 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. (Option not available for SRX Series.)

notification—(Optional) Notify applications upon commit completion.

peers—(Optional) Specify the host names or IP addresses of the MC-LAG peers and the user authentication details for the users administering the MC-LAG peers that are participating in commit synchronization.

NOTE: Starting in Junos OS Release 17.1R1, the **peers** option at the **[edit system commit]** hierarchy level is not supported in batch configuration mode.

peers-synchronize—(Optional) Configure a commit synchronization on MC-LAG peers.

persist-group-inheritance—(Optional) Configure this option to improve commit performance for systems that use many configuration groups that use wildcards. This option causes the full inheritance paths of the configuration groups to be built in the database instead of in the process memory. Starting in Junos OS Evolved Release 19.2R1 and Junos OS Release 19.4R1, this option is enabled by default. To disable this option, use **no-persist-groups-inheritance**.

server—(Optional) Configure a default batch commit.

synchronize—(Optional) 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. (Option not available for SRX Series.)

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

Required Privilege Level

maintenance—To view this statement in the configuration.

maintenance-control—To add this statement to the configuration.

RELATED DOCUMENTATION

[Improving Commit Time When Using Configuration Groups | 109](#)

server

synchronize

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

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.

NOTE: We recommend that you enable compression of the router configuration files to minimize the amount of disk space that they require.

Default

The current operational configuration file is compressed.

Options

This command has no options.

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

| *Compressing the Current Configuration File*

configuration-database

Syntax

```
configuration-database {
  ephemeral {
    allow-commit-synchronize-with-gres;
    ignore-ephemeral-default;
    instance instance-name;
  }
  extend-size;
  max-db-size max-db-size;
  resize {
    database-size-diff size MB;
    database-size-on-disk size MB;
  }
  virtual-memory-mapping {
    process process name {
      fixed-size size KB;
      page-pooling-size size KB;
    }
  }
}
```

Hierarchy Level

[edit system]

Release Information

Statement introduced in Junos OS Release 13.2.

Description

Define parameters for the configuration databases.

Configure the **virtual-memory-mapping** statement hierarchy to increase the memory space available for the configuration database size per process, as needed, by using virtual memory mapping and page-pooling.

Configure the **ephemeral** statement hierarchy to specify options for the ephemeral configuration database.

Configure the **resize** statement hierarchy when it is necessary to resize the configuration database.

Options

ephemeral—Configure settings for the ephemeral configuration database. **instance** sets the instance name, **allow-commit-synchronize-with-gres** enables a device to synchronize ephemeral configuration data

to the other Routing Engine when GRES is enabled on the device and a commit synchronize operation is requested, and **ignore-ephemeral-default** disables the default instance of the ephemeral configuration database.

extend-size—For the M Series, MX Series, or T Series devices only, increase the memory space available for the configuration database, per process, up to 1.5 GB. The extended default size is based on the original default database size. A device with a default database size of 409.99 MB will extend to a maximum of 1049.99 MB, and a device with a default database size of 665.99 MB will extend to a maximum of 1305.99.

NOTE: You must reboot the router after committing this statement to make the change effective.

Starting with Junos OS Release 15.1R2, any operation on the **system configuration-database extend-size** configuration statement such as, **deactivate**, **delete**, or **set**, generates the following warning message:

Change in 'system configuration-database extend-size' will be effective at next reboot only.

max-db-size—Configures the maximum database size.

resize—For the M Series, MX Series, or T Series devices only, resizes the configuration database. The database will be resized automatically during the commit based on the values specified in the **database-size-diff** and **database-size-on-disk** attributes. The system will display **Database resize completed** when the configuration database has been successfully resized.

virtual-memory-mapping—Define parameters for using virtual memory mapping for the configuration database on a per-process basis. You can define a fixed size for the initial portion of the database and configure a page-pooling size for the remaining portion of the database. The parameter **process** sets the process name, while **fixed-size** sets the size in kilobytes to directly map for the initial portion of the configuration database for the specified process and **page-pooling-size** sets the size in kilobytes to use for page-pooling the remaining data in the database, with the valid range being from 512KB to 680MB for each.

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

Required Privilege Level

admin—To view this statement in the configuration.

admin-control—To add this statement to the configuration.

RELATED DOCUMENTATION

Example: Configuring Virtual Memory for Process Configuration Data | 104

domain-name

Syntax

```
domain-name domain-name;
```

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

domain-name—Name of the domain.

NOTE: The length of the domain name cannot exceed 255 characters.

Required Privilege Level

system—To view this statement in the configuration.

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

domain-search

Syntax

```
domain-search [domain-list ];
```

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 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

domain-list—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:

```
[edit system]
set domain-search [domain1.net domain2.net domain3.net]
```

Required Privilege Level

system—To view this statement in the configuration.

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

events

Syntax

```
events (change-log | interactive-commands | login);
```

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

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

Specifying TACACS+ Auditing and Accounting Events

Configuring RADIUS System Accounting

host-name

Syntax

```
host-name hostname;
```

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

hostname—Name of the router or switch.

Required Privilege Level

system—To view this statement in the configuration.

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

inet6-backup-router

Syntax

```
inet6-backup-router address <destination destination-address>;
```

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

address—Address of the default router.

destination *destination-address*—(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.

Default: All hosts (default route) are reachable through the backup router.

Required Privilege Level

system—To view this statement in the configuration.

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

location (System)

Syntax

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

Hierarchy Level

[edit system]

Release Information

Statement introduced 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

altitude *feet*—Number of feet above sea level.

building *name*—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 (" ").

country-code *code*—Two-letter country code.

floor *number*—Floor in the building.

hcoord *horizontal-coordinate*—Bellcore Horizontal Coordinate.

lata *transport-area*—Local Access Transport Area.

latitude *degrees*—Latitude in degree format.

longitude *degrees*—Longitude in degree format.

npa-nxx *number*—First six digits of the phone number (area code and exchange).

postal-code *postal-code*—Postal code.

rack *number*—Rack number.

vcoord *vertical-coordinate*—Bellcore Vertical Coordinate.

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

| [Specifying the Device Physical Location](#) | 83

management-instance

Syntax

```
management-instance;
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced in Junos OS Release 17.3R1.

Description

Enable a dedicated management virtual routing and forwarding (VRF) instance.

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.

The name of the dedicated management instance is reserved and hardcoded as **mgmt_junos**; you cannot configure any other routing instance by the name **mgmt_junos**.

For more information about configuring the **mgmt_junos** routing instance, see *Management Interface in a Nondefault Instance*

Options

This command has no options.

Required Privilege Level

system—To view this statement in the configuration.

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

max-configurations-on-flash

Syntax

```
max-configurations-on-flash number;
```

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

number—The number of configurations stored on the CompactFlash card.

Range: 0 through 49. The most recently saved configuration is number 0, and the oldest saved configuration is number 49.

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

[Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card](#) | 79

message

Syntax

```
message text;
```

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 message. This message appears before a user logs in.

You can format the message using the following special characters:

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

Options

text—Text of the message.

Required Privilege Level

system—To view this statement in the configuration.

system-control—To add this statement to the configuration

RELATED DOCUMENTATION

Configuring Junos OS to Display a System Login Message

[announcement](#) | 124

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.

Options

This command has no options.

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 Drive](#) | 78

name-server (System Services)

Syntax

```
name-server {  
  address {  
    routing-instance routing-instance;  
  }  
}
```

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.

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.

routing-instance options introduced in Junos OS Release 19.2R1 under the **[edit system]** hierarchy level only.

Description

Configure one or more Domain Name System (DNS) name servers.

Options

address—Address of the name server. To configure multiple name servers, include a maximum of three **address** options.

routing-instance *routing-instance*—Configure name of the routing instance through which the name server is reachable.

NOTE: The only routing instance supported is `mgmt_junos`.

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

| *Configuring a DNS Name Server for Resolving Hostnames into Addresses*

non-subscriber-no-reply

Syntax

```
non-subscriber-no-reply;
```

Hierarchy Level

```
[edit system 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.

Options

This command has no options.

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

| *autoinstallation*

pic-console-authentication

Syntax

```
pic-console authentication {  
  (encrypted-password "password");  
}
```

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

encrypted-password "password"—Use MD5 or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password.

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.

Required Privilege Level

admin—To view this statement in the configuration.

admin-control—To add this statement to the configuration.

RELATED DOCUMENTATION

[Configuring Junos OS to Set Console and Auxiliary Port Properties](#) | 84

Configuring Password Authentication for Console Access to PICs

port (Syslog)

Syntax

```
port port number;
```

Hierarchy Level

```
[edit system syslog host hostname | 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

port number—Port number of the remote syslog server.

Range: 0 through 65535

Default: 514

Required Privilege Level

system—To view this statement in the configuration.

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

RELATED DOCUMENTATION

syslog

host

ports

Syntax

```
ports {  
  auxiliary {  
    disable;  
    insecure;  
    type terminal-type;  
    port-type (mini-usb | rj45);  
  }  
  console {  
    disable;  
    insecure;  
    log-out-on-disconnect;  
    type terminal-type;  
  }  
}
```

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 properties of the console and auxiliary ports. The ports are located on the router's craft interface.

See the switch's hardware documentation for port locations.

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

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](#) | **101**

proxy (System)

Syntax

```
proxy {  
  server (hostname | ip-address);  
  port port-number;  
  username username;  
  password password;  
}
```

Hierarchy Level

[edit system]

Release Information

Statement introduced in Junos OS Release 11.4.

Description

Configure the proxy server properties for a device.

Options

server—Configure the server by hostname or IP address.

port—Set the port number for the proxy server ranging from 0 through 65535.

username—Specify the user name configured in the proxy server.

password—Specify the password associated with the **username** for 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

[Example: Configuring a Proxy Server for License Updates](#) | 74

redundancy-interface-process

Syntax

```
redundancy-interface-process {  
    command binary-file-path;  
    disable;  
    failover (alternate-media | other-routing-engine);  
}
```

Hierarchy Level

[edit system processes]

Release Information

Statement introduced in Junos OS Release 8.5.

Description

Specify as an active or backup process of an application server, configure to process traffic for more than one logical application server.

Options

command *binary-file-path*—Path to the binary process.

disable—Disable the redundancy interface management process.

failover—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.

alternate-media—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.

other-routing-engine—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

Required Privilege Level

system—To view this statement in the configuration.

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

root-authentication

Syntax

```
root-authentication {
  encrypted-password "password";
  no-public-keys
  ssh-eccdsa name {
    from from;
  }
  ssh-ed25519 name {
    from from;
  }
  ssh-rsa name {
    from from;
  }
}
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced before Junos OS Release 7.4.

Statement introduced in Junos OS Release 8.5 for SRX Series.

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

Statement introduced in Junos OS Release 11.1 for the QFX Series.

Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure the authentication methods for the root-level user, whose username is **root**.

You can use the **ssh-eccdsa**, **ssh-ed25519**, or **ssh-rsa** statements to directly configure SSH ECDSA, ED25519, or RSA 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.

Options

encrypted-password "password"—Specify the MD5 or other password. You can specify only one encrypted password. You cannot configure a blank 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.

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

ssh-ecdsa *name* from *from*—Use an SSH ECDSA public key. You can specify one or more public keys.

ssh-ed25519 *name* from *from*—Use an SSH ED25519 public key. You can specify one or more public keys.

ssh-rsa *name* from *from*—Use an SSH RSA 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

class (Defining Login Classes)

user (Access)

root-login

Syntax

```
root-login (allow | deny | deny-password);
```

Hierarchy Level

```
[edit system services ssh]
```

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

Control user access through SSH.

Default

root-login deny-password is the default for most systems.

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**.

Options

allow—Allow users to log in to the router or switch as root through SSH.

deny—Disable users from logging in to the router or switch as root through SSH.

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.

Required Privilege Level

admin—To view this statement in the configuration.

admin-control—To add this statement to the configuration.

RELATED DOCUMENTATION

| *Configuring SSH Service for Remote Access to the Router or Switch*

routing (System Processes)

Syntax

```
routing {
  force-32-bit | force-64-bit | auto-64-bit;
}
```

Hierarchy Level

```
[edit system processes],
[edit logical-systems logical-system name system processes]
```

Release Information

Statement introduced in Junos OS Release 13.3 R4.

Description

Configure routing protocols process (rpd) mode.

Default

force-32-bit mode is used in Junos 15.1F2 and prior releases

auto-64-bit mode is used starting in Junos 15.1F3

Options

auto-64-bit—(Optional) Enable to use 64-bit mode. If the system is 64-bit capable and has at least 16 GB of RAM, then **auto-64-bit** will cause the Routing Engine to run in 64-bit mode. Otherwise, it will run in 32-bit mode.

NOTE: This option is not applicable for logical systems.

NOTE: Starting in Junos 15.1F3, 15.1R2, 15.1R3, and 15.2R1, 64-bit mode is enabled by default on systems that support it and which have at least 16 GB of RAM.

force-32-bit—(Optional) Enable to always use 32-bit mode.

NOTE: For MX Series routers, virtual private LAN service (VPLS) dynamic profiles are not supported with the 64-bit mode routing protocol process (rpd). To enable VPLS dynamic profiles configuration, configure the routing process to use 32-bit mode.

force-64-bit—(Optional) Enable to always use 64-bit mode.

TIP: You need not restart the routing protocol process (rpd) to use the 64-bit mode. However, forcing rpd from 32-bit to 64-bit or 64-bit-to 32-bit will restart the rpd process, which can impact the routing protocols. For this reason, it is recommended to perform these changes in a maintenance window.

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 | 101](#)

[processes | 149](#)

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

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):

- **saved-core-context**—The router saves each cores file and its associated context in a compressed tar file named `/var/tmp/process-name.core.core-number.tgz`.
- **no-saved-core-context**—The router does not save cores files and their associated context.

Options

These commands have no options.

Required Privilege Level

admin—To view this statement in the configuration.

admin-control—To add this statement to the configuration.

RELATED DOCUMENTATION

[Saving Core Files from Junos OS Processes](#) | 99

[saved-core-files](#) | 159

saved-core-files

Syntax

```
saved-core-files number;
```

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

number—Maximum number of core files to save. The valid range is from 1 through 10.

Required Privilege Level

admin—To view this statement in the configuration.

admin-control—To add this statement to the configuration.

RELATED DOCUMENTATION

[Saving Core Files from Junos OS Processes | 99](#)

[saved-core-context | 158](#)

static-host-mapping

Syntax

```
static-host-mapping {
  hostname {
    alias [ aliases ];
    inet [ addresses ];
    inet6 [ addresses ];
    sysid system-identifier;
  }
}
```

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

alias *alias*—Alias for the hostname.

hostname—Fully qualified hostname.

inet *address*—IP address. You can specify one or more IP addresses for the host.

sysid *system-identifier*—ISO system identifier (system ID). This is the 6-byte portion of the Intermediate System-to-Intermediate System (IS-IS) network service access point (NSAP). We recommend that you use the host's IP address represented in binary-coded decimal (BCD) format. For example, the IP address 208.197.169.18 is 2081.9716.9018 in BCD.

Required Privilege Level

system—To view this statement in the configuration.

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

File Management Commands

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- file compare | 173
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- file show | 187

file archive

Syntax

```
file archive destination destination source source
<compress>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.

For information on valid filename and URL formats, see [“Format for Specifying Filenames and URLs in Junos OS CLI Commands” on page 70](#).

Options

destination *destination*—Destination of the archived file or files. Specify the destination as a URL or filename.

The Junos OS adds one of the following suffixes if the destination filename does not already have it:

- For archived files—The suffix **.tar**
- For archived and compressed files—The suffix **.tgz**

source *source*—Source of the original file or files. Specify the source as a URL or filename.

compress—(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix **.tgz**.

Required Privilege Level

maintenance

RELATED DOCUMENTATION

[Format for Specifying Filenames and URLs in Junos OS CLI Commands](#) | 70

List of Sample Output

[file archive \(Multiple Files\) on page 165](#)

[file archive \(Single File\) on page 165](#)

[file archive \(with Compression\) on page 165](#)

[File Archive Using Secure Copy Protocol \(scp\) with 'source-address' and 'routing-instance' options on page 166](#)

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 messages files in the local directory **/var/log/** 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 a single messages file in the local directory **/var/log/** 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 messages files in the local directory **/var/log/** 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.
```

```
user@host>
```

File Archive Using Secure Copy Protocol (scp) with 'source-address' and 'routing-instance' options

To use the scp command to archive a file with the **source-address** and **routing-instance** options, enter the following command:

```
user@host> file archive source source destination scp:// destination source-address address  
routing-instance instance-name
```


file checksum md5

Syntax

```
file checksum md5 <pathname> filename
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Calculate the Message Digest 5 (MD5) checksum of a file.

Options

pathname—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the MD5 checksum.

Required Privilege Level

maintenance

RELATED DOCUMENTATION

Configuring Checksum Hashes for a Commit Script

Configuring Checksum Hashes for an Event Script

Configuring Checksum Hashes for an Op Script

Configuring Checksum Hashes for an SNMP Script

Executing an Op Script from a Remote Site

[file checksum sha-256 | 171](#)

[file checksum sha1 | 169](#)

List of Sample Output

[file checksum md5 on page 168](#)

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

```
file checksum sha1 <pathname> filename
```

Release Information

Command introduced in Junos OS Release 9.5.

Command introduced in Junos OS Release 9.5 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.

Options

pathname—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the SHA-1 checksum.

Required Privilege Level

maintenance

RELATED DOCUMENTATION

Configuring Checksum Hashes for a Commit Script

Configuring Checksum Hashes for an Event Script

Configuring Checksum Hashes for an Op Script

Configuring Checksum Hashes for an SNMP Script

Executing an Op Script from a Remote Site

[file checksum md5 | 167](#)

[file checksum sha-256 | 171](#)

List of Sample Output

[file checksum sha1 on page 170](#)

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/opscrip.slax
```

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

file checksum sha-256

Syntax

```
file checksum sha-256 <pathname> filename
```

Release Information

Command introduced in Junos OS Release 9.5.

Command introduced in Junos OS Release 9.5 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.

Options

pathname—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the SHA-256 checksum.

Required Privilege Level

maintenance

RELATED DOCUMENTATION

Configuring Checksum Hashes for a Commit Script

Configuring Checksum Hashes for an Event Script

Configuring Checksum Hashes for an Op Script

Configuring Checksum Hashes for an SNMP Script

Executing an Op Script from a Remote Site

[file checksum md5 | 167](#)

[file checksum sha1 | 169](#)

List of Sample Output

[file checksum sha-256 on page 172](#)

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

```
file compare (files filename filename)  
<context | unified>  
<ignore-white-space>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Compare two local files and describe the differences between them in default, context, or unified output styles:

- **Default**—In the first line of output, **c** means lines were changed between the two files, **d** means lines were deleted between the two files, and **a** means lines were added between the two files. The numbers preceding this alphabetical marker represent the first file, and the lines after the alphabetical marker represent the second file. A left angle bracket (<) in front of output lines refers to the first file. A right angle bracket (>) in front of output lines refers to the second file.
- **Context**—The display is divided into two parts. The first part is the first file; the second part is the second file. Output lines preceded by an exclamation point (!) have changed. Additions are marked with a plus sign (+), and deletions are marked with a minus sign (-).
- **Unified**—The display is preceded by the line number from the first and the second file (xx,xxx,x). Before the line number, additions to the file are marked with a plus sign (+), and deletions to the file are marked with a minus sign (-). The body of the output contains the affected lines. Changes are viewed as additions plus deletions.

Options

files *filename*—Names of two local files to compare.

context—(Optional) Display output in context format.

ignore-white-space—(Optional) Ignore changes in the amount of white space.

unified—(Optional) Display output in unified format.

Required Privilege Level

none

RELATED DOCUMENTATION

[Format for Specifying Filenames and URLs in Junos OS CLI Commands](#) | 70

[Viewing Core Files from Junos OS Processes](#) | 100

List of Sample Output

[file compare files on page 174](#)

[file compare files context on page 174](#)

[file compare files unified on page 175](#)

[file compare files unified ignore-white-space on page 175](#)

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>source-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 17.3R1.

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 file name and URL formats, see [“Format for Specifying Filenames and URLs in Junos OS CLI Commands” on page 70](#).



CAUTION: 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, see the Juniper Networks Knowledge Base article [here](#).

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*.

Options

source—Specify the source URL.

destination—Specify the destination URL.

source-address**source-address**—(Optional) Specify the local address to use in originating the connection.

staging-directory **directory-location**—(Optional) Specify the staging directory on Routing Engine

Required Privilege Level

maintenance

RELATED DOCUMENTATION

[Format for Specifying Filenames and URLs in Junos OS CLI Commands](#) | 70

[Default Directories for Junos OS File Storage on the Network Device](#) | 21

List of Sample Output

[Copy a File from the Local Device to a Personal Computer on page 178](#)

[Copy a Configuration File between Routing Engines on page 179](#)

[Copy a File Using File Transfer Protocol which Requires a Password on page 179](#)

[Copy a File Using a Staging Directory on page 179](#)

Sample Output

Following are some **file copy** examples.

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 File Using File Transfer Protocol which Requires 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 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

```
file delete filename  
<purge>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Delete a file on the local router or switch.

Options

filename—Name of the file to delete. For a routing matrix, include chassis information in the filename if the file to be deleted is not local to the Routing Engine from which the command is issued.

purge—(Optional) Overwrite regular files before deleting them.

Required Privilege Level

maintenance

List of Sample Output

[file delete on page 180](#)

[file delete \(Routing Matrix\) on page 181](#)

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

```
file list <detail | recursive> <path>
```

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 list of files on the local router or switch.

Options

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.

detail—(Optional) Display detailed information about the files. The output is similar to what is displayed by the Linux **ls -l** command.

recursive—(Optional) Display detailed information about the files in the directory and all subdirectories below it.

path—(Optional) List the files in a specified directory path. The path name cannot contain any special characters (![=;|(){}]).

Additional Information

To view available directories, enter a space and then a slash (/) after the **file list** command. To view files within a specific directory, include a slash followed by the directory and, optionally, subdirectory name after the **file list** command.

Required Privilege Level

maintenance

List of Sample Output

[file list on page 183](#)

[file list \(detailed\) on page 183](#)

[file list \(recursive\) on page 183](#)

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

```
file rename source destination
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Rename a file on the local router or switch.

Options

destination—New name for the file.

source—Original name of the file. For a routing matrix, the filename must include the chassis information.

Required Privilege Level

maintenance

List of Sample Output

[file rename on page 185](#)

[file rename \(Routing Matrix\) on page 186](#)

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

```
file show filename  
<encoding (base64 | raw)>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Display the contents of a file.

Options

filename—Name of a file. For a routing matrix, the file name 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 187](#)

[file show \(Routing Matrix\) on page 188](#)

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
```

System Software Administrative Commands

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clear system reboot

List of Syntax

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Syntax

```
clear system reboot  
<both-routing-engines>
```

Syntax (EX Series Switches)

```
clear system reboot  
<all-members>  
<both-routing-engines>  
<local>  
<member member-id>
```

Syntax (TX Matrix Router)

```
clear system reboot  
<both-routing-engines>  
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
clear system reboot  
<both-routing-engines>  
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (QFX Series)

```
clear system reboot  
<infrastructure name>  
<interconnect-device name>  
<node-group name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Clear any pending system software reboots or halts. When issued on a TX Matrix router without any options, the default behavior clears all pending system software reboots or halts on all T640 routers connected to the TX Matrix router. When issued on a TX Matrix Plus router without any options, the default behavior clears all pending system software reboots or halts on all T1600 or T4000 routers connected to the TX Matrix Plus router.

Options

none—Clear all pending system software reboots or halts.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for all the Routing Engines in the chassis.

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

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

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[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[clear system reboot on page 192](#)

[clear system reboot \(TX Matrix Router\) on page 193](#)

[clear system reboot \(QFX Series\) on page 193](#)

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.
```

request flight-recorder set high-cpu

Syntax

```
request flight-recorder set high-cpu
  <disable>
  <backoff-duration seconds>
  <collect-core>
  <cpu-threshold percentage>
  <logical-system>
  <num-snapshots number>
  <polling-frequency frequency>
```

Release Information

Command introduced in Junos OS Release 18.2R1 on all platforms.

Description

Enable flight recorder tool to collect snapshots of historical data on when the CPU utilization for the routing protocol process on a device was high and what processes caused the high utilization. The detection of high CPU usage enables faster resolution of issues.

The recorded snapshots and core files are saved as log files in a folder under the `/var/log/flight_recorder/` directory. The log files are listed in the order of time stamp saved. The folder format is **Flr_MONTH_DD_YYYY_HH:MM:SS**; for example, **Flr_May_09_2018_02:20:50**. Each log file in the directory includes the following information:

- Output from the **show task accounting detail** command (after enabling and waiting for 10 seconds).
- Output from the **show task jobs** command.
- Running core data stored in a separate core log file, if enabled.

Options

none—Enable flight recorder tool to collect snapshots of data used for detecting high CPU utilization. The recorded snapshots and core files are saved as log files in a folder under the `/var/log/flight_recorder/`.

disable—Disable flight recorder tool that has been enabled using the **request flight-recorder set high-cpu** command.

Default: Disabled.

backoff-duration *seconds*—(Optional) Specify the time interval in seconds between two snapshots of data.

Default: 100 seconds.

Range: 10 through 1000.

collect-core—(Optional) Perform snapshot collection of the running core with every snapshot of data taken.

When the **collect-core** option is enabled, the data snapshots are stored in a separate core log file in a folder under the `/var/log/flight_recorder/` directory. The folder format is **Flr_MONTH_DD_YYYY_HH:MM:SS**; for example, **Flr_May_09_2018_02:20:50**.

Default: Disabled.

cpu-threshold *percentage*—(Optional) Specify the maximum value of CPU utilization in percentage, beyond which the collection of data is triggered.

Default: 80

Range: 1 through 400.

logical-system—(Optional) Enable data collection on logical systems.

Default: Disabled.

num-snapshots *number*—(Optional) Specify the number of snapshots of data to be collected before quitting the collection process.

Default: 0

Range: 1 through 20

polling-frequency *seconds*—(Optional) Specify the time in seconds for polling for high CPU utilization.

Default: 10 seconds.

Range: 5 through 100.

Required Privilege Level

root

RELATED DOCUMENTATION

| [show flight-recorder status](#) | [294](#)

List of Sample Output

[request flight-recorder set high-cpu \(Enable flight-recorder\) on page 196](#)

[request flight-recorder set high-cpu disable \(When flight-recorder is enabled\) on page 196](#)

[request flight-recorder set high-cpu disable \(When flight-recorder is disabled\) on page 196](#)

Output Fields

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

Sample Output

request flight-recorder set high-cpu (Enable flight-recorder)

```
user@host> request flight-recorder set high-cpu cpu-threshold 10 polling-frequency 5 backoff-duration  
10 collect-core num-snapshots 1
```

```
Please wait....Starting flight-recorder process.
```

request flight-recorder set high-cpu disable (When flight-recorder is enabled)

```
user@host> request flight-recorder set high-cpu disable
```

```
Disabling Done
```

request flight-recorder set high-cpu disable (When flight-recorder is disabled)

```
user@host> request flight-recorder set high-cpu disable
```

```
Flight Recorder is not running!
```

request message

Syntax

```
request message all message "text"
request message message "text" (terminal terminal-name | user user-name)
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display a message on the screens of all users who are logged in to the router or switch or on specific screens.

Options

all—Display a message on the terminal of all users who are currently logged in.

message "text"—Message to display.

terminal *terminal-name*—Name of the terminal on which to display the message.

user *user-name*—Name of the user to whom to direct the message.

Required Privilege Level

maintenance

List of Sample Output

[request message message on page 197](#)

Output Fields

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

Sample Output

request message message

```
user@host> request message message "Maintenance window in 10 minutes" user maria
```

```
Message from user@host on ttyp0 at 20:27 ...  
Maintenance window in 10 minutes  
EOF
```


request system configuration database resize

Syntax

```
request system configuration database resize
<force>
<re0 | re1>
<routing-engine backup | master | both | local>
```

Release Information

Command introduced in Junos OS Release 17.2R1 for i386 platforms on the M Series , MX Series, or T Series devices only.

Description

You might require to perform a resizing of the configuration database as a result of performing frequent load replacement operations which replaces the configuration hierarchy with the new configuration. When this occurs, deleted objects store in the database, and the memory allocated in the database is freed after the commit is completed. However, during this process the database size on disk can grow although the actual configuration size is actually less.

The **request system configuration database resize** command provides you with a manual method to resize the configuration database. The system will display **Database resize completed** when the configuration database has been successfully resized.

Use the **show system configuration database usage** command to display configuration database disk space usage statistics. The Current database size on disk field will display the change in database size related to the use of the **resize** command. See [show system configuration database usage](#).

Options

force—(Optional) If there are uncommitted changes and you execute the **request system configuration database resize** command, the command will fail and an error will be generated (**error: Database resize failed, Configuration Database Modified.**). To execute the command when this occurs, use the **force** option to discard the uncommitted changes.

re0 | re1—(Optional) If a router has dual Routing Engines, **re0** and **re1** identify the specific routing engine that is to execute the **request system configuration database resize** command. **re0** is for the Routing Engine in slot 0 and **re1** is for the Routing Engine in slot 1.

routing-engine—(Optional) To execute the **request system configuration database resize** command on a specific routing engine, or on both routing engines, in a redundant configuration you can specify one of the following:

- backup—Resizes the configuration database on the backup routing engine in a redundant configuration.
- master—Resizes the configuration database on the master routing engine in a redundant configuration.
- both—Resizes the configuration database on both routing engines.
- local—Resizes the configuration database on the local routing engine.

Additional Information

Include below is a set of usage guidelines when using the **request system configuration database resize** command:

- All other configuration sessions will be closed on the routing engine to remove the old mappings to the configuration database.
- This command cannot be run from configuration mode.
- Do not execute the **request system configuration database resize** command when a commit is in progress.
- During the time when the **request system configuration database resize** command is in progress, a new configuration session cannot be opened. A warning message will appear instructing you that the configuration database is being resized (**warning: Database is being resized**).
- If there are uncommitted changes and the command is executed, the command will fail and an error will be generated (**error: Database resize failed, Configuration Database Modified.**). To execute the command when this occurs, use the **force** option to discard the uncommitted changes.
- To execute the command on both routing engines use the **request system configuration database resize routing-engine both** command.
- Do not abort the command when it is in progress (for example, by specifying **Ctrl+c** or **Ctrl+z**).

Required Privilege Level

maintenance

List of Sample Output

[request system configuration database resize on page 200](#)

Output Fields

Sample Output

request system configuration database resize

```
user@host> show system configuration database usage
```

```
Maximum size of the database: 1309.99 MB  
Current database size on disk: 500.00 MB  
Actual database usage: 176.81 MB  
Available database space: 1133.18 MB
```

user@host> **request system configuration database resize**

```
Database resize completed
```

user@host> **show system configuration database usage**

```
Maximum size of the database: 1309.99 MB  
Current database size on disk: 176.50 MB  
Actual database usage: 176.48 MB  
Available database space: 1133.52 M
```

request system halt

List of Syntax

[Syntax on page 202](#)

[Syntax \(EX Series Switches\) on page 202](#)

[Syntax \(PTX Series\) on page 202](#)

[Syntax \(TX Matrix Router\) on page 203](#)

[Syntax \(TX Matrix Plus Router\) on page 203](#)

[Syntax \(MX Series Router\) on page 203](#)

[Syntax \(QFX Series\) on page 204](#)

Syntax

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

Syntax (EX Series Switches)

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

Syntax (PTX Series)

```
request system halt
<at time>
<backup-routing-engine>
<both-routing-engines>
```

```

<other-routing-engine>
<in minutes>
<media (compact-flash | disk)>
<message "text">

```

Syntax (TX Matrix Router)

```

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

```

Syntax (TX Matrix Plus Router)

```

request system halt
<all-chassis | all-lcc | lcc number | sfc number>
<at time>
<backup-routing-engine>
<both-routing-engines>
<other-routing-engine>
<in minutes>
<media (compact-flash | disk)>
<message "text">

```

Syntax (MX Series Router)

```

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

```

Syntax (QFX Series)

```
request system halt
<all-members>
<at time>
<both-routing-engines>
<director-device director-device-id>
<in minutes>
<local>
<media >
<member member-id>
<message "text">
<other-routing-engine>
<slice slice>
```

Release Information

Command introduced before Junos OS Release 7.4.

other-routing-engine option introduced in Junos OS Release 8.0.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

director-device option introduced for QFabric systems in Junos OS Release 12.2.

backup-routing-engine option introduced in Junos OS Release 13.1.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Stop the router or switch software.

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—(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.
- **yyymmddhhmm**—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—(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*—(Optional) Halt the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, ***member-id*** can only be 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 190
request system power-off 217
request vmhost halt
show virtual-chassis
Routing Matrix with a TX Matrix Plus Router Solutions Page

- List of Sample Output**
- [request system halt on page 207](#)
 - [request system halt \(In 2 Hours\) on page 208](#)
 - [request system halt \(Immediately\) on page 208](#)
 - [request system halt \(At 1:20 AM\) on page 208](#)

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 logout

Syntax

```
request system logout (pid pid | terminal terminal | user username)  
<all>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Log out users from the router or switch and the configuration database. If a user held the **configure exclusive** lock, this command clears the exclusive lock.

Options

all—(Optional) Log out all sessions owned by a particular PID, terminal session, or user. (On a TX Matrix or TX Matrix Plus router, this command is broadcast to all chassis.)

pid *pid*—Log out the user session using the specified management process identifier (PID). The PID type must be management process.

terminal *terminal*—Log out the user for the specified terminal session.

user *username*—Log out the specified user.

Required Privilege Level

configure

RELATED DOCUMENTATION

| [Log a User Out of the Device](#) | 98

List of Sample Output

[request system logout on page 210](#)

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 211](#)

[Syntax \(TX Matrix Router\) on page 211](#)

[Syntax \(TX Matrix Plus Router\) on page 211](#)

[Syntax \(MX Series Router\) on page 211](#)

Syntax

```
request system partition abort
```

Syntax (TX Matrix Router)

```
request system partition abort
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
request system partition abort
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)

```
request system partition abort
<all-members>
<local>
<member member-id>
```

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

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Abort a previously scheduled partition operation for all chassis.

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.

all-members—(MX Series routers only) (Optional) Abort a previously scheduled partition operation for all members of the Virtual Chassis configuration.

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](#) | [214](#)

List of Sample Output

[request system partition abort on page 213](#)

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 214](#)

[Syntax \(TX Matrix Router\) on page 214](#)

[Syntax \(TX Matrix Plus Router\) on page 214](#)

[Syntax \(MX Series Router\) on page 214](#)

Syntax

```
request system partition hard-disk
```

Syntax (TX Matrix Router)

```
request system partition hard-disk
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
request system partition hard-disk
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)


```
request system partition hard-disk
<all-members>
<local>
<member member-id>
```

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

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.

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.

all-members—(MX Series routers only) (Optional) Schedule a partition of the hard disk for all members of the Virtual Chassis configuration.

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

[request system partition abort | 211](#)

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[request system partition hard-disk on page 216](#)

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 217](#)

[Syntax \(EX Series Switches\) on page 217](#)

[Syntax \(TX Matrix Router\) on page 217](#)

[Syntax \(TX Matrix Plus Router\) on page 218](#)

[Syntax \(MX Series Router\) on page 218](#)

[Syntax \(QFX Series\) on page 218](#)

Syntax

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

Syntax (EX Series Switches)

```
request system power-off
<all-members>
<at time>
<both-routing-engines>
<in minutes>
<local>
<media (external | internal)>
<member member-id>
<message "text">
<other-routing-engine>
<slice slice>
```

Syntax (TX Matrix Router)

```
request system power-off
<all-chassis | all-lcc | lcc number | scc>
<both-routing-engines>
<other-routing-engine>
<at time>
<in minutes>
<media (compact-flash | disk)>
```

```
<message "text">
```

Syntax (TX Matrix Plus Router)

```
request system power-off
<all-chassis | all-lcc | lcc number | sfc number>
<both-routing-engines>
<other-routing-engine>
<at time>
<in minutes>
<media (compact-flash | disk)>
<message "text">
```

Syntax (MX Series Router)

```
request system power-off
<all-members>
<at time>
<both-routing-engines>
<in minutes>
<local>
<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 222](#)

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 process terminate

Syntax

```
request system process terminate process-id
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Terminate any process that you specify with the process identification number (process ID or pid). The **request system process terminate** command is an alternative to using the **restart** command. The **restart** command terminates and restarts a process that you specify by process name, but limits you to only certain well-known processes.



CAUTION: Caution: Never terminate a software process unless instructed to do so by a customer support engineer. Restarting processes could cause unknown system behavior resulting in partial or complete traffic loss.

Use the [show system processes](#) command to display a list of processes by process ID.

Options

process-id—Identification number for a process.

Range: 1 through 99999

Required Privilege Level

maintenance

RELATED DOCUMENTATION

[show system processes](#) | 330

[List of Junos OS Processes](#) | 12

List of Sample Output

[request system process terminate on page 224](#)

Output Fields

When you enter this command, you are not provided feedback on the status of your request. You can use the **show system processes extensive** command to confirm the process that was terminated.

Sample Output

```
request system process terminate
```

```
user@host> request system process terminate 1514
```

request system reboot

List of Syntax

[Syntax on page 225](#)

[Syntax \(EX Series Switches and EX Series Virtual Chassis\) on page 225](#)

[Syntax \(MX Series Routers and MX Series Virtual Chassis, EX9200 Switches and EX9200 Virtual Chassis\) on page 225](#)

[Syntax \(QFabric Systems\) on page 226](#)

[Syntax \(QFX Series Switches and QFX Series Virtual Chassis, Virtual Chassis Fabric\) on page 226](#)

[Syntax \(TX Matrix Router\) on page 226](#)

[Syntax \(TX Matrix Plus Router\) on page 226](#)

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 and EX Series Virtual Chassis)

```
request system reboot
  <all-members | local | member member-id>
  <at time>
  <in minutes>
  <media (external | internal)> | <media (compact-flash | disk | removable-compact-flash | usb)>
  <message "text">
  <slice slice>
```

Syntax (MX Series Routers and MX Series Virtual Chassis, EX9200 Switches and EX9200 Virtual Chassis)

```
request system reboot
  <all-members | local | member member-id>
  <at time>
  <both-routing-engines>
  <in minutes>
  <media (external | internal)> | <media (compact-flash | disk | usb)> | <junos | network | oam | usb>
  <message "text">
  <other-routing-engine>
```

Syntax (QFabric Systems)

```
request system reboot
<all <graceful>>
<at time>
<director-device name>
<director-group <graceful>>
<fabric <graceful>>
<in minutes>
<in-service>
<media>
<message "text">
<node-group name>
<slice slice>
```

Syntax (QFX Series Switches and QFX Series Virtual Chassis, Virtual Chassis Fabric)

```
request system reboot
<all-members | local | member member-id>
<at time>
<in minutes>
<in-service>
<hypervisor>
<junos | network | oam | usb>
<message "text">
<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)>

```

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 **partition** changed to **slice** in Junos OS Release 10.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Option **both-routing-engines** introduced in Junos OS Release 12.1.

Description

Reboot the software.

This command can be used on standalone devices and on devices supported in a Virtual Chassis, Virtual Chassis Fabric, or QFabric system.

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*.

NOTE: On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the Routing Engine to the backup Routing Engine, and then reboot.

Options

The options described here are not all supported on every platform or release of Junos OS. Refer to the Syntax sections for the options commonly available on each type of platform.

none—Reboot the software immediately.

all-chassis—(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—(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 | local | member *member-id*—(Optional) Specify which member of the Virtual Chassis to reboot:

- **all-members**—Reboots each switch that is a member of the Virtual Chassis.
- **local**—Reboots only the local switch (switch where you are logged in).
- **member *member-id***—Reboots the specified member switch of the Virtual Chassis

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.
- ***yyymmddhhmm***—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.

hypervisor—(Optional) Reboot Junos OS, host OS, and any installed guest VMs.

in *minutes*—(Optional) Number of minutes from now to reboot the software. The minimum value is 1. This option is an alias for the **at +*minutes*** option.

in-service—(Optional) Enables you to reset the software state (no software version change) of the system with minimal disruption in data and control traffic.

junos—(Optional) Reboot from the Junos OS (main) volume.

lcc *number*—(Optional) Line-card chassis (LCC) 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.

media (compact-flash | disk | removable-compact-flash | usb)—(Optional) Use the indicated boot medium for the next boot.

media (external | internal)—(Optional) Use the indicated boot medium for the next boot:

- **external**—Reboot the device using a software package stored on an external boot source, such as a USB flash drive.
- **internal**—Reboot the device using a software package stored in an internal memory source.

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

network—(Optional) Reboot using the Preboot Execution Environment (PXE) boot method over the network.

oam—(Optional) Reboot from the maintenance volume (OAM volume, usually the compact flash drive).

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 *partition*—(Optional) Reboot using the specified partition on the boot media. This option is equivalent to the **slice** option that is supported on some devices. Specify one of the following *partition* values:

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

scc—(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*—(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*—(Optional) Reboot using the specified partition on the boot media. This option was originally the **partitiion** option but was renamed to **slice** on EX Series and QFX Series switches. Specify one of the following *slice* values:

- **1**—Reboot from partition 1.

- **2**—Reboot from partition 2.
- **alternate**—Reboot from the alternate partition (which did not boot the switch at the last bootup).

NOTE: The **slice** option is not supported on QFX Series switches that have no alternate slice when Junos OS boots as a Virtual Machine (VM). To switch to the previous version of Junos OS, issue the **request system software rollback** command.

usb—(Optional) Reboot from a USB device.

The following options are available only on QFabric Systems:

all—(Optional) Reboots the software on the Director group, fabric control Routing Engines, fabric manager Routing Engines, Interconnect devices, and network and server Node groups.

director-device name—(Optional) Reboots the software on the Director device and the default partition (QFabric CLI).

director-group—(Optional) Reboots the software on the Director group and the default partition (QFabric CLI).

fabric—(Optional) Reboots the fabric control Routing Engines and the Interconnect devices.

node-group name—(Optional) Reboots the software on a server Node group or a network Node group.

graceful—(Optional) Enables the QFabric component to reboot with minimal impact to network traffic. This sub-option is only available for the **all**, **fabric**, and **director-group** options.

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

- [clear system reboot | 190](#)
- [request system halt | 202](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)
- [request vmhost reboot](#)

List of Sample Output

- [request system reboot on page 231](#)
- [request system reboot \(at 2300\) on page 232](#)
- [request system reboot \(in 2 Hours\) on page 232](#)
- [request system reboot \(Immediately\) on page 232](#)
- [request system reboot \(at 1:20 AM\) on page 232](#)
- [request system reboot in-service on page 232](#)

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 reboot in-service

```
user@switch> request system reboot in-service
```

```

Reboot the system ? [yes,no]
[Feb 22 02:37:04]:ISSU: Validating Image

PRE ISSR CHECK:
-----
PFE Status                : Online
Member Id zero            : Valid
VC not in mixed or fabric mode : Valid
Member is single node vc  : Valid
BFD minimum-interval check done : Valid
GRES enabled              : Valid
NSR enabled               : Valid
drop-all-tcp not configured : Valid
Ready for ISSR            : Valid

warning: Do NOT use /user during ISSR. Changes to /user during ISSR may get lost!
Current image is jinstall-jcp-i386-flex-18.1.img
[Feb 22 02:37:14]:ISSU: Preparing Backup RE
Prepare for ISSR
[Feb 22 02:37:19]:ISSU: Backup RE Prepare Done
Spawning the backup RE
Spawn backup RE, index 1 successful
Starting secondary dataplane
Second dataplane container started
GRES in progress
Waiting for backup RE switchover ready
GRES operational
Copying home directories
Copying home directories successful
Initiating Chassis In-Service-Upgrade for ISSR
Chassis ISSU Started
[Feb 22 02:42:55]:ISSU: Preparing Daemons
[Feb 22 02:43:00]:ISSU: Daemons Ready for ISSU
[Feb 22 02:43:05]:ISSU: Starting Upgrade for FRUs
[Feb 22 02:43:15]:ISSU: FPC Warm Booting
[Feb 22 02:44:16]:ISSU: FPC Warm Booted
[Feb 22 02:44:27]:ISSU: Preparing for Switchover
[Feb 22 02:44:31]:ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item                Status                Reason
  FPC 0                Online (ISSU)
Send ISSR done to chassisd on backup RE
Chassis ISSU Completed
Removing dcpfe0 eth1 128.168.0.16 IP

```

```
Bringing down bme00
Post Chassis ISSU processing done
[Feb 22 02:44:33]:ISSU: IDLE
Stopping primary dataplane
Clearing ISSU states
Console and management sessions will be disconnected. Please login again.
device_handoff successful ret: 0
Shutdown NOW!
[pid 14305]

*** FINAL System shutdown message from root@sw-duckhorn-01 ***

System going down IMMEDIATELY
```

request system snapshot

List of Syntax

[Syntax \(ACX Series Routers\) on page 235](#)

[Syntax \(EX Series Switches; for EX4600, see QFX Series Syntax\) on page 235](#)

[Syntax \(MX Series Routers\) on page 235](#)

[Syntax \(PTX Series\) on page 235](#)

[Syntax \(QFX Series, OCX1100, and EX4600\) on page 236](#)

[Syntax \(TX Matrix Routers\) on page 236](#)

[Syntax \(TX Matrix Plus Routers\) on page 236](#)

Syntax (ACX Series Routers)

```
request system snapshot
<media type>
<partition>
```

Syntax (EX Series Switches; for EX4600, see QFX Series Syntax)

```
request system snapshot
<all-members | local | member member-id>
<media type>
<partition>
<re0 | re1 | routing-engine routing-engine-id>
<slice alternate>
```

Syntax (MX Series Routers)

```
request system snapshot
<all-members>
<config-partition>
<local>
<member member-id>
<media usb-port-number>
<partition>
<root-partition>
```

Syntax (PTX Series)

```
request system snapshot
<partition>
```

Syntax (QFX Series, OCX1100, and EX4600)

```
request system snapshot
<all-members | local | member member-id>
<config-partition>
<partition>
<root-partition>
<slice alternate>
```

Syntax (TX Matrix Routers)

```
request system snapshot
<all-chassis | all-lcc | lcc number | scc>
<config-partition>
<partition>
<root-partition>
```

Syntax (TX Matrix Plus Routers)

```
request system snapshot
<all-chassis | all-lcc | lcc number | sfc number>
<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 routers running Junos OS, 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 switches running Junos OS, 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 version of Junos OS, the active configuration, and log files.
- On devices running Junos OS Evolved, take a snapshot of the contents of the **/soft** directory, which includes the running version of Junos OS Evolved.



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: System snapshot is not supported on QFX10000 switches.

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 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.

(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.
- (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

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List of Sample Output

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[request system snapshot all-members \(Virtual Chassis\) on page 244](#)

[request system snapshot \(Junos OS Evolved\) on page 244](#)

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/dal) ...
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/dals1a' .. (this may take a few minutes)
Copying '/dev/da0s2a' to '/dev/dals2a' .. (this may take a few minutes)
Copying '/dev/da0s3d' to '/dev/dals3d' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/dals3e' .. (this may take a few minutes)
Copying '/dev/da0s4d' to '/dev/dals4d' .. (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 (dal) ...
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/dals1a' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/dals3e' .. (this may take a few minutes)
Copying '/dev/da0s2f' to '/dev/dals1f' .. (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 snapshot (Junos OS Evolved)

```
user@host> request system snapshot
```

```
-----
node: re0
```

```

-----
Snapshot device found - /dev/sdb
System is up for 29 minutes, proceed and initiate snapshot
Creating snapshot mount dirs in /tmp/snapshot
Creating snapshot disk filesystems and mounts
sfdisk: failed to dump partition table: Success
Found 186 gig (195360984 kbytes) Vendor ATA, Model XXXXXXXXXXXXXXXX-

Writing new partitioning table to disk sdb -
    boot - 204800K
    soft - 16384M
    swap - 4096M
    data - 3072M
    conf - 1024M
    var - 166006M
    user - 0M
Done
New Partitions - rebuilding filesystems
Error: Could not stat device sdb - No such file or directory.
Processing /dev/sdb2 for mount on /tmp/snapshot/soft
...[creating]..ok [mounting]..done
    Processing /dev/sdb5 for mount on /tmp/snapshot/data
...[creating]..ok [mounting]..done
    Processing /dev/sdb6 for mount on /tmp/snapshot/data/config
...[creating]..ok [mounting]..done
    Processing /dev/sdb7 for mount on /tmp/snapshot/data/var
...[creating]..ok [mounting]..done
    Setting up swapspace version 1, size = 4 GiB (4294963200 bytes)
    no label, UUID=xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx
    Processing /dev/sdb1 for mount on /tmp/snapshot/boot
...[creating]..ok [mounting]..mkswap: /dev/sdb3: warning: wiping old swap signature.

done
Done with local filesystems setup.
.....
Space available 14822042 K, proceeding...
Copying junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2...
Copying /soft/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
to /tmp/snapshot//soft/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
Installing BOM...
    bom.xml...done
    bom.sh...done
    bom.py...done
Done.

```

```

        Copying files to
/tmp/snapshot//soft/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2...
        Copying files for node re...
        Boot objects...
            bzImage-re-64b.bin...done
            bzImage-re-64b.bin.psig...done
            .bzImage-re-64b.bin.hmac...done
            bzImage-ptx1000-rcb.dtb...done
            bzImage-ptx1000-rcb.dtb.psig...done
        FSF files...
            ptx-fixed-js64_Yocto_2.2_x86_64.fs...done
            java_Yocto_2.2_x86_64.fs...done
            .....
            modules_Yocto_2.2_x86_64.fs...done
            zookeeper_Yocto_2.2_x86_64.fs...done
            python-2.7_Yocto_2.2_x86_64.fs...done
            dev_Yocto_2.2_x86_64.fs...done
            perl-5.22.1_Yocto_2.2_x86_64.fs...done
            initrd_Yocto_2.2_x86_64.fs...done
            initrd_Yocto_2.2_x86_64.fs.psig...done
            .initrd_Yocto_2.2_x86_64.fs.hmac...done
            python-3.5_Yocto_2.2_x86_64.fs...done
            jimbase_Yocto_2.2_x86_64.fs...done
            osbase_Yocto_2.2_x86_64.fs...done
        done.
        Done installing modules for re.
        Copying /data/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2

        Copying
/data/config/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
        Copying
/data/etc/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
        Copying
/data/var_db/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
        .....
        Copying
/data/usr_conf/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
        Copying
/data/var_rundb/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
        Copying
/data/usr_evo_share/junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2
        Copying /data/var
        Copying /boot

```



```
Unmounting snapshot mounts  
Snapshot completed for /dev/sdb
```

request system software abort

Syntax

```
request system software abort in-service-upgrade
```

Release Information

Command introduced in JUNOS Release 9.0.

Command introduced in Junos OS Release 13.2 for PTX5000 routers.

Description

Abort a unified in-service software upgrade (ISSU). The unified ISSU must be in progress and you must issue this command from a router session other than the one on which you issued the **request system in-service-upgrade** command that launched the unified ISSU.

Options

This command has no options.

Required Privilege Level

view

RELATED DOCUMENTATION

request system software in-service-upgrade

show chassis in-service-upgrade

Getting Started with Unified In-Service Software Upgrade

Example: Performing a Unified ISSU

List of Sample Output

[request system software abort \(New Router Session\) on page 249](#)

[request system software in-service-upgrade \(Unified ISSU Session\) on page 249](#)

Output Fields

When you enter the **request system software abort** command on a new router session, you are provided feedback on the status of your request in the router session on which you issued the **request system software in-service-upgrade** command.

Sample Output

request system software abort (New Router Session)

```
user@host> request system software abort
```

request system software in-service-upgrade (Unified ISSU Session)

```
user@host> request system software in-service-upgrade
/var/tmp/jinstall-9.0-20080117.0-domestic-signed.tgz
```

```
ISSU: Preparing Backup RE
Pushing bundle to rel
Checking compatibility with configuration Initializing...
Using jbase-9.0-20080116.2
Verified manifest signed by PackageProduction_9_0_0 Using
/var/tmp/jinstall-9.0-20080117.0-domestic-signed.tgz
Verified jinstall-9.0-20080117.0-domestic.tgz signed by PackageProduction_9_0_0
Using jinstall-9.0-20080117.0-domestic.tgz
Using jbundle-9.0-20080117.0-domestic.tgz
Checking jbundle requirements on /
Using jbase-9.0-20080117.0.tgz
Verified manifest signed by PackageProduction_9_0_0 Using jkernel-9.0-20080117.0.tgz
Verified manifest signed by PackageProduction_9_0_0 Using
jcrypto-9.0-20080117.0.tgz Verified manifest signed by PackageProduction_9_0_0
Using jpfe-9.0-20080117.0.tgz Using jdocs-9.0-20080117.0.tgz Verified manifest
signed by PackageProduction_9_0_0 Using jroute-9.0-20080117.0.tgz Verified manifest
signed by PackageProduction_9_0_0 Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-9.0-20080117.0-domestic-signed.tgz'
...
Verified jinstall-9.0-20080117.0-domestic.tgz signed by PackageProduction_9_0_0
Adding jinstall...
Verified manifest signed by PackageProduction_9_0_0

WARNING:      This package will load JUNOS 9.0-20080117.0 software.
WARNING:      It will save JUNOS configuration files, and SSH keys
WARNING:      (if configured), but erase all other files and information
WARNING:      stored on this machine. It will attempt to preserve dumps
WARNING:      and log files, but this can not be guaranteed. This is the
WARNING:      pre-installation stage and all the software is loaded when
WARNING:      you reboot the system.
```

```
Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:      A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:      'request system reboot' command when software installation is
WARNING:      complete. To abort the installation, do not reboot your system,
WARNING:      instead use the 'request system software delete jinstall'
WARNING:      command as soon as this operation completes.

Saving package file in
/var/sw/pkg/jinstall-9.0-20080117.0-domestic-signed.tgz ...
Saving state for rollback ...
Backup upgrade done
Rebooting Backup RE

Rebooting rel
error: ISSU Aborted! Backup RE maybe in inconsistent state, Please restore backup
RE
ISSU: IDLE

{master}
user@host>
```

request system software add

List of Syntax

[Syntax on page 251](#)

[Syntax \(EX Series Switches\) on page 251](#)

[Syntax \(TX Matrix Router\) on page 252](#)

[Syntax \(TX Matrix Plus Router\) on page 252](#)

[Syntax \(MX Series Router\) on page 252](#)

[Syntax \(QFX Series\) on page 253](#)

[Syntax \(OCX Series\) on page 253](#)

[Syntax \(Junos OS Evolved\) on page 254](#)

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>
```

Syntax (Junos OS Evolved)

```
request system software add package-name
<force>
<no-validate>
<reboot>
<restart>
```

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.

The following options are deprecated in Junos OS Evolved Release 18.3R1: **best-effort-load**, **delay-restart**, **no-copy**, **on-primary**, (**re0** | **re1**), **set**, **unlink**, **validate**, **validate-on-host**, and **validate-on-routing-engine**.

Description

For Junos OS Evolved, the **request system software add** command has a built-in feature not to start the upgrade if a reboot is pending after an upgrade or rollback.

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” on page 70](#).



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: When graceful Routing Engine switchover (GRES) is enabled on a device, you must perform a unified in-service software upgrade (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.

NOTE: In Junos OS, **package-name** can be either the URL of a remote location or the pathname of a local package. But Junos OS Evolved does not support a remote iso for upgrade, so “URL” is removed from the help string in the CLI.

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 the 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 the 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.

restart—(Optional) (For Junos OS Evolved only) This option allows you to upgrade the system using an application-level restart, that is, no system reboot. First the system determines how many applications need to restart (start with a new version), and then, after sending output to the CLI session, it restarts those applications. Restarted applications resync their state from the system. You can perform a dry run by using the *request system software validate-restart* command before using the **request system software add restart** command.

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, jkernel, last. Add the operating system package, jkernel, first and the routing software package, jroute, last. If you are upgrading all packages at once, delete and add them in the following order:

```
user@host> request system software add /var/tmp/jbase
user@host> request system software add /var/tmp/jkernel
user@host> request system software add /var/tmp/jpfe
user@host> request system software add /var/tmp/jdocs
user@host> request system software add /var/tmp/jroute
user@host> request system software add /var/tmp/jcrypto
```

By default, when you issue the **request system software add *package-name*** command on a TX Matrix master Routing Engine, all the T640 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix backup Routing Engine, all the T640 backup Routing Engines that are connected to it are upgraded to the same version of software.

Likewise, when you issue the **request system software add *package-name*** command on a TX Matrix Plus master Routing Engine, all the T1600 or T4000 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix Plus backup

Routing Engine, all the T1600 or T4000 backup Routing Engines that are connected to it are upgraded to the same version of software.

Before installing software on a device that has one or more custom YANG data models added to it, back up and remove the configuration data corresponding to the custom YANG data models from the active configuration. For more information see *Managing YANG Packages and Configurations During a Software Upgrade or Downgrade*.

Required Privilege Level
maintenance

RELATED DOCUMENTATION

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request system software rollback
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Installing Software Packages on QFX Series Devices
Upgrading Software on a QFabric System
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- [request system software add restart \(Junos OS Evolved\) on page 266](#)

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 ...

```

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 software add restart (Junos OS Evolved)

```
user@device> request system software add restart /var/tmp/qfx-ms-fixed-1-target1-ifmanarpcos.iso
```

```
Adding software images. This process can take several minutes. Please be patient...
Download and Validate in Progress
re0: Starting upgrade : /var/tmp/qfx-ms-fixed-1-target1-ifmanarpcos.iso
re0: Single RE upgrade detected.
re0: Installing IMA keys of the incoming ISO image...
re0: Validating existing configs. See /var/log/validation_config.log for config
validation logs.
re0: Validation Passed. Going ahead with Installation
re0: Starting the installation...
re0: Copying files to
//soft/junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190523235333-1...
re0: Running post install commands...
re0: Post install sequence was successful.
re0: Installation of image
junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190523235333-1 done.
re0: Boot version is now
'junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190523235333-1'
Image validation and installation succeeded. Restarting Applications.
```

```

*** Restart Apps list ***
arpd
ifmand
cosd
Activating active instance of app arpd on node re0
Activating active instance of app ifmand on node re0
Activating active instance of app cosd on node re0
Image activation succeeded for arpd on node re0
Stopping active instance of app arpd on node re0
Image activation succeeded for ifmand on node re0
Stopping active instance of app ifmand on node re0
Image activation succeeded for cosd on node re0
Stopping active instance of app cosd on node re0
App arpd stopped on node re0
Starting active instance of app arpd on node re0
App ifmand stopped on node re0
Starting active instance of app ifmand on node re0
App cosd stopped on node re0
Starting active instance of app cosd on node re0
App cosd started/restarted on node re0
App ifmand started/restarted on node re0
App arpd started/restarted on node re0
*** Restart Summary ***
    *** Restart Success ***
    arpd
    ifmand
    cosd
Please check the status of applications using 'show system alarms'

```

user@device> **request system software add restart**
/var/tmp/qfx-ms-fixed-1-target2-ifmanarpcossysman.iso

```

Adding software images. This process can take several minutes. Please be patient...
Download and Validate in Progress
re0: Starting upgrade : /var/tmp/qfx-ms-fixed-1-target2-ifmanarpcossysman.iso
re0: Single RE upgrade detected.
re0: Installing IMA keys of the incoming ISO image...
re0: Validating existing configs. See /var/log/validation_config.log for config
validation logs.
re0: Validation Passed. Going ahead with Installation
re0: Starting the installation...
re0: Copying files to
//soft/junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190523235731-1...

```

```

re0: Running post install commands...
re0: Post install sequence was successful.
re0: Installation of image
junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190523235731-1 done.
re0: Boot version is now
'junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190523235731-1'
Image validation and installation succeeded. Restarting Applications.

*** Restart Apps list ***
sysman
arpd
ifmand
cosd
Activating active instance of app sysman on node re0
Image activation succeeded for sysman on node re0
Restarting active instance of app sysman on node re0
App sysman started/restarted on node re0
Activating active instance of app arpd on node re0
Activating active instance of app ifmand on node re0
Activating active instance of app cosd on node re0
Image activation succeeded for arpd on node re0
Stopping active instance of app arpd on node re0
Image activation succeeded for ifmand on node re0
Stopping active instance of app ifmand on node re0
Image activation succeeded for cosd on node re0
Stopping active instance of app cosd on node re0
App cosd stopped on node re0
Starting active instance of app cosd on node re0
App ifmand stopped on node re0
Starting active instance of app ifmand on node re0
App arpd stopped on node re0
Starting active instance of app arpd on node re0
App cosd started/restarted on node re0
App ifmand started/restarted on node re0
App arpd started/restarted on node re0
*** Restart Summary ***
    *** Restart Success ***
    sysman
    arpd
    ifmand

```

```
cosd
```

```
Please check the status of applications using 'show system alarms'
```

```
user@device> request system software add restart
```

```
/var/tmp/qfx-ms-fixed-1-target3-ifmanarpcossysmanimgdorhd.iso
```

```
ifmanarpcossysmanimgdor
```

```
Adding software images. This process can take several minutes. Please be patient...
```

```
Download and Validate in Progress
```

```
re0: Starting upgrade :
```

```
/var/tmp/qfx-ms-fixed-1-target3-ifmanarpcossysmanimgdorhd.iso
```

```
re0: Single RE upgrade detected.
```

```
re0: Installing IMA keys of the incoming ISO image...
```

```
re0: Validating existing configs. See /var/log/validation_config.log for config  
validation logs.
```

```
re0: Validation Passed. Going ahead with Installation
```

```
re0: Starting the installation...
```

```
re0: Copying files to
```

```
//soft/junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190524000025...
```

```
re0: Running post install commands...
```

```
re0: Post install sequence was successful.
```

```
re0: Installation of image
```

```
junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190524000025-gsanka-1  
done.
```

```
re0: Boot version is now
```

```
'junos-evo-install-qfx-ms-fixed-x86-64-19.2R1-20190522.4-EVOI20190524000025'
```

```
Image validation and installation succeeded. Restarting Applications.
```

```
*** Restart Apps list ***
```

```
sysman
```

```
arpd
```

```
ifmand
```

```
cosd
```

```
imgd
```

```
orchestrator
```

```
Activating active instance of app sysman on node re0
```

```
Image activation succeeded for sysman on node re0
```

```
Restarting active instance of app sysman on node re0
```

```
App sysman started/restarted on node re0
```

```
Activating active instance of app arpd on node re0
```

```
Activating active instance of app ifmand on node re0
```

```
Activating active instance of app cosd on node re0
```

```
Image activation succeeded for arpd on node re0
```

```
Stopping active instance of app arpd on node re0
Image activation succeeded for ifmand on node re0
Stopping active instance of app ifmand on node re0
Image activation succeeded for cosd on node re0
Stopping active instance of app cosd on node re0
App arpd stopped on node re0
Starting active instance of app arpd on node re0
App ifmand stopped on node re0
Starting active instance of app ifmand on node re0
App cosd stopped on node re0
Starting active instance of app cosd on node re0
App cosd started/restarted on node re0
App arpd started/restarted on node re0
App ifmand started/restarted on node re0
Activating active instance of app imgd on node re0
Activating active instance of app orchestrator on node re0
Image activation succeeded for imgd on node re0
Image activation succeeded for orchestrator on node re0
Restarting active instance of app imgd on node re0
Restarting active instance of app orchestrator on node re0
```


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](#) | 235

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 273](#)

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
...

```

show chassis hardware

List of Syntax

[Syntax on page 275](#)

[Syntax \(EX Series, MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms\) on page 275](#)

[Syntax \(TX Matrix Router\) on page 275](#)

[Syntax \(TX Matrix Plus Router\) on page 275](#)

[Syntax \(MX Series Routers\) on page 276](#)

[Syntax \(QFX Series\) on page 276](#)

Syntax

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
```

Syntax (EX Series, MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<satellite [slot-id slot-id | device-alias alias-name]>
```

Syntax (TX Matrix Router)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc number | sfc number>
```

Syntax (MX Series Routers)

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
<all-members>
<local>
<member member-id>
```

Syntax (QFX Series)

```
show chassis hardware
<detail | extensive>
<clei-models>
<interconnect-device name>
<node-device name>
<models>
```

Release Information

Command introduced before Junos OS Release 7.4.

models option introduced in Junos OS Release 8.2.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.

Command introduced in Junos OS Release 11.1 for QFX Series.

Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.

Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.

Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms.

Information for **disk** and **usb** introduced in Junos OS Release 15.1X53-D60 for QFX10002, QFX10008, and QFX10016 switches.

Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.

Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms and PTX10008 Routers.

Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms and MX150 Router Appliance.

Command introduced in Junos OS Release 17.4 for MX204 Routers.

Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.

Command introduced in Junos OS Release 18.2R1 for MX10008 Routers and EX9253 Switches.

NOTE: Routers and routing platforms use the basic syntax, unless otherwise listed. For example, the EX Series has an additional satellite parameter available.

Description

Display a list of all Flexible PIC Concentrators (FPCs) and PICs installed in the router or switch chassis, including the hardware version level and serial number.

In the EX Series switch command output, FPC refers to the following:

- On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC *number* is always 0.
- On EX4200 switches in a Virtual Chassis configuration—Refers to the member of a Virtual Chassis; FPC *number* equals the member ID, from 0 through 9.
- On EX8208 and EX8216 switches—Refers to a line card; FPC *number* equals the slot number for the line card.

On QFX3500, QFX5100, and OCX Series standalone switches, and PTX1000 routers both the FPC and FPC *number* are always 0.

On T4000 Type 5 FPCs, there are no **top temperature sensor** or **bottom temperature sensor** parameters. Instead, **fan intake temperature sensor** and **fan exhaust temperature sensors** parameters are displayed.

Starting from Junos OS Release 11.4, the output of the **show chassis hardware models** operational mode command displays the enhanced midplanes FRU model numbers (CHAS-BP3-MX240-S, CHAS-BP3-MX480-S or CHAS-BP3-MX960-S) based on the router. Prior to release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through the Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 14.1, the output of the **show chassis hardware detail | extensive | clei-models | models** operational mode command displays the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

Options

none—Display information about hardware. For a TX Matrix router, display information about the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display information about the TX Matrix Plus router and its attached routers.

clei-models—(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).

detail—(Optional) Include RAM and disk information in output.

extensive—(Optional) Display ID EEPROM information.

all-members—(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.

lcc *number*—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display hardware information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

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

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

local—(MX Series routers only) (Optional) Display hardware-specific information for the local Virtual Chassis members.

member *member-id*—(MX Series routers and EX Series switches) (Optional) Display hardware-specific information for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value 0 or 1.

models—(Optional) Display model numbers and part numbers for orderable FRUs and, for components that use ID EEPROM format v2, the CLEI code.

node-device *name*—(QFabric systems only) (Optional) Display hardware-specific information for the Node device.

satellite [*slot-id slot-id* | *device-alias alias-name*]—(Junos Fusion only) (Optional) Display hardware information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

scc—(TX Matrix router only) (Optional) Display hardware information for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Display hardware information for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

Additional Information

The **show chassis hardware detail** command now displays DIMM information for the following Routing Engines, as shown in [Table 8 on page 279](#).

Table 8: Routing Engines Displaying DIMM Information

Routing Engines	Routers
RE-S-1800x2 and RE-S-1800x4	MX240, MX480, and MX960 routers
RE-A-1800x2	M120 and M320 routers

In Junos OS Release 11.4 and later, the output for the **show chassis hardware models** operational mode command for MX Series routers display the enhanced midplanes FRU model numbers—CHAS-BP3-MX240-S, CHAS-BP3-MX480-S, or CHAS-BP3-MX960-S—based on the router. In releases before Junos OS Release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 17.3R1, the output of the **show chassis hardware** command displays the mode in which vMX is running (performance mode or lite mode) in the part number field for the FPC. **RIOT-PERF** indicates performance mode and **RIOT-LITE** indicates lite mode.

Required Privilege Level

view

RELATED DOCUMENTATION

| [*show chassis power*](#)

List of Sample Output

[show chassis hardware \(MX10008 Router\) on page 284](#)

[show chassis hardware clei-models \(PTX10016 Routers\) on page 285](#)

[show chassis hardware detail \(EX9251 Switch\) on page 287](#)

[show chassis hardware extensive \(T640 Router\) on page 287](#)

[show chassis hardware interconnect-device \(QFabric Systems\) on page 288](#)

[show chassis hardware lcc \(TX Matrix Router\) on page 289](#)

[show chassis hardware models \(MX2010 Router\) on page 290](#)

[show chassis hardware node-device \(QFabric Systems\) on page 291](#)

[show chassis hardware scc \(TX Matrix Router\) on page 291](#)

[show chassis hardware sfc \(TX Matrix Plus Router\) on page 291](#)

Output Fields

[Table 9 on page 280](#) lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 9: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item		All levels

Table 9: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
	<p>Chassis component:</p> <ul style="list-style-type: none"> • (EX Series switches)—Information about the chassis, Routing Engine (SRE and Routing Engine modules in EX8200 switches), power supplies, fan trays, and LCD panel. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). Information about the backplane, midplane, and SIBs (SF modules) is displayed for EX8200 switches. • (MX Series routers and EX Series switches)—Information about the backplane, Routing Engine, Power Entry Modules (PEMs), and fan trays. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs), Modular Port Concentrators (MPCs) and associated Modular Interface Cards (MICs), or Dense Port Concentrators (DPCs). MX80 routers have a single Routing Engine and a built-in Packet Forwarding Engine that attaches directly to MICs. The Packet Forwarding Engine has two “pseudo” FPCs (FPC 0 and FPC1). MX80 routers also have a Forwarding Engine Board (FEB). MX104 routers have a built-in Packet forwarding Engine and a Forwarding Engine Board (FEB). The Packet Forwarding Engine of the MX104 router has three “pseudo” FPCs (FPC0, FPC1, and FPC2). • (M Series routers, except for the M320 router)—Information about the backplane; power supplies; fan trays; Routing Engine; maxicab (the connection between the Routing Engine and the backplane, for the M40 router only); SCB, SSB, SFM, or FEB; MCS and PCG (for the M160 router only); each FPC and PIC; and each fan, blower, and impeller. • (M120, M320, and T Series routers)—Information about the backplane, power supplies, fan trays, midplane, FPM (craft interface), CIP, PEM, SCG, CB, FPC, PIC, SFP, SPMB, and SIB. • (QFX Series)—Information about the chassis, Pseudo CB, Routing Engine, power supplies, fan trays, Interconnect devices, and Node devices. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). • (PTX Series)—Information about the chassis, midplane, craft interface (FPM), power distribution units (PDUs) and Power Supply Modules (PSMs), Centralized Clock Generators (CCGs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Flexible PIC Concentrators (FPCs), PICs, Switch Interface Boards (SIBs), and fan trays (vertical and horizontal). • (MX2010, MX2020, and MX2008 routers)—Information about the chassis, midplane, craft interface (FPM), power midplane (PMP), Power Supply Modules (PSMs), Power Distribution Modules (PDMs), Routing 	

Table 9: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
	Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Switch Fabric Boards (SFBs), Flexible PIC Concentrators (FPCs), PICs, adapter cards (ADCs) and fan trays. <ul style="list-style-type: none"> • (vMX routers)—Information about the chassis, midplane, Routing Engines, and Control Boards (CBs). Also displays information about Flexible PIC Concentrators (FPCs) and associated Modular Interface Cards (MICs) and Physical Interface Cards (PICs). 	
Version	Revision level of the chassis component.	All levels
Part number	Part number of the chassis component.	All levels
Serial number	Serial number of the chassis component. The serial number of the backplane is also the serial number of the router chassis. Use this serial number when you need to contact Juniper Networks Customer Support about the router or switch chassis.	All levels
Assb ID or Assembly ID	(extensive keyword only) Identification number that describes the FRU hardware.	extensive
Assembly Version	(extensive keyword only) Version number of the FRU hardware.	extensive
Assembly Flags	(extensive keyword only) Flags.	extensive
FRU model number	(clei-models , extensive , and models keyword only) Model number of the FRU hardware component.	none specified
CLEI code	(clei-models and extensive keyword only) Common Language Equipment Identifier code. This value is displayed only for hardware components that use ID EEPROM format v2. This value is not displayed for components that use ID EEPROM format v1.	none specified
EEPROM Version	ID EEPROM version used by the hardware component: 0x00 (version 0), 0x01 (version 1), or 0x02 (version 2).	extensive
Description	Brief description of the hardware item: <ul style="list-style-type: none"> • Type of power supply. • Type of PIC. If the PIC type is not supported on the current software release, the output states Hardware Not Supported. 	All levels

Table 9: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> • Type of FPC: FPC Type 1, FPC Type 2, FPC Type 3, FPC Type 4 , or FPC TypeOC192. <p>On EX Series switches, a brief description of the FPC.</p> <p>The following list shows the PIM abbreviation in the output and the corresponding PIM name.</p> <ul style="list-style-type: none"> • 2x FE—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM • 4x FE—4-port Fast Ethernet ePIM • 1x GE Copper—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port) • 1x GE SFP—SFP Gigabit Ethernet ePIM (one fiber port) • 2x Serial—Dual-port serial PIM • 2x T1—Dual-port T1 PIM • 2x E1—Dual-port E1 PIM • 2x CT1E1—Dual-port channelized T1/E1 PIM • 1x T3—T3 PIM (one port) • 1x E3—E3 PIM (one port) • 4x BRI S/T—4-port ISDN BRI S/T PIM • 4x BRI U—4-port ISDN BRI U PIM • 1x ADSL Annex A—ADSL 2/2+ Annex A PIM (one port, for POTS) • 1x ADSL Annex B—ADSL 2/2+ Annex B PIM (one port, for ISDN) • 2x SHDSL (ATM)—G SHDSL PIM (2-port two-wire module or 1-port four-wire module) • 1x TGM550—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog LINE ports, and two analog TRUNK ports) • 1x DS1 TIM510—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup) • 4x FXS, 4x FX0, TIM514—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog LINE ports and four analog TRUNK ports) • 4x BRI TIM521—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports) • Crypto Accelerator Module—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services 	

Table 9: show chassis hardware Output Fields (continued)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> • MPC M 16x 10GE—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.) • For hosts, the Routing Engine type. • For small form-factor pluggable transceiver (SFP) modules, the type of fiber: LX, SX, LH, or T. • LCD description for EX Series switches (except EX2200 switches). • MPC2—1-port MPC2 that supports two separate slots for MICs. • MPC3E—1-port MPC3E that supports two separate slots for MICs (MIC-3D-1X100GE-CFP and MIC-3D-20GE-SFP) on MX960, MX480, and MX240 routers. The MPC3E maps one MIC to one PIC (1 MIC, 1 PIC), which differs from the mapping of legacy MPCs. • 100GBASE-LR4, pluggable CFP optics • Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy. • Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs). • MPC4E—Fixed configuration MPC4E that is available in two flavors: MPC4E-3D-32XGE-SFPP and MPC4E-3D-2CGE-8XGE on MX2020, MX960, MX480, and MX240 routers. • LCD description for MX Series routers 	

Sample Output

show chassis hardware (MX10008 Router)

user@host> show chassis hardware

```

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               DE487         JNP10008 [MX10008]
Midplane      REV 27   750-054097   ACPD4307      Midplane 8
Routing Engine 0                BUILTIN      BUILTIN      RE X10 LT
Routing Engine 1                BUILTIN      BUILTIN      RE X10
CB 0          REV 02   750-079563   CAFF4580      Control Board
CB 1          REV 04   750-079563   CAGL8034      Control Board
..

```

```

...
..
4
FPC 3          REV 04  750-084779  CAKR7019          JNP10K-LC2101
  CPU          REV 05  750-073391  CAKJ2854          LC 2101 PMB
  PIC 0                BUILTIN    BUILTIN           4xQSFP28 SYNCE
    Xcvr 0        REV 01  740-058734  1ACQ104300K       QSFP-100GBASE-SR4
  PIC 1                BUILTIN    BUILTIN           4xQSFP28 SYNCE
    Xcvr 0        REV 01  740-061405  1ACQ12110AN       QSFP-100GBASE-SR4
  PIC 2                BUILTIN    BUILTIN           4xQSFP28 SYNCE
    Xcvr 0        REV 01  740-046565  QG1105B2          QSFP+-40G-SR4
  PIC 3                BUILTIN    BUILTIN           4xQSFP28 SYNCE
    Xcvr 0        REV 01  740-045627  QH08036X          40GBASE eSR4
  PIC 4                BUILTIN    BUILTIN           4xQSFP28 SYNCE
    Xcvr 0        REV 01  740-067443  XWR0RY7           QSFP+-40G-SR4
    Xcvr 1        REV 01  740-067443  XWR0RYH           QSFP+-40G-SR4
    Xcvr 2        REV 01  740-067443  XWR0RYP           QSFP+-40G-SR4
    Xcvr 3        REV 01  740-067443  XWS028S           QSFP+-40G-SR4
  PIC 5                BUILTIN    BUILTIN           4xQSFP28 SYNCE
    Xcvr 3        REV 01  740-058734  1ACQ113406C       QSFP-100GBASE-SR4
FPD Board      REV 07  711-054687  ACPD6799          Front Panel Display
PEM 0          REV 02  740-049388  1EDL62102N9       Power Supply AC
PEM 1          REV 02  740-049388  1EDL60300KX       Power Supply AC
PEM 2          REV 02  740-049388  1EDL60300DL       Power Supply AC
PEM 3          REV 02  740-049388  1EDL61701BT       Power Supply AC
PEM 4          REV 02  740-049388  1EDL62102P7       Power Supply AC
PEM 5          REV 02  740-049388  1EDL62102PP       Power Supply AC
FTC 0          REV 14  750-050108  ACPE4038          Fan Controller 8
FTC 1          REV 14  750-050108  ACPE4032          Fan Controller 8
Fan Tray 0     REV 09  760-054372  ACPD6799          Fan Tray 8
Fan Tray 1     REV 09  760-054372  ACNZ3584          Fan Tray 8
SFB 0          REV 24  750-050058  ACPD4587          Switch Fabric (SIB) 8
SFB 1          REV 24  750-050058  ACNZ0635          Switch Fabric (SIB) 8
SFB 2          REV 24  750-050058  ACPD4908          Switch Fabric (SIB) 8
SFB 3          REV 24  750-050058  ACNZ0617          Switch Fabric (SIB) 8
SFB 4          REV 24  750-050058  ACNZ0527          Switch Fabric (SIB) 8
SFB 5          REV 23  750-050058  ACNX6980          Switch Fabric (SIB) 8

```

show chassis hardware clei-models (PTX10016 Routers)

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
------	---------	-------------	-----------	------------------

Midplane	REV 24	750-077138	CMMUN00ARA	JNP10016
CB 0	REV 04	711-065897	PROTOXCLEI	PROTO-ASSEMBLY
CB 1	REV 05	711-065897	PROTOXCLEI	PROTO-ASSEMBLY
FPC 2				
PIC 0		BUILTIN		
FPC 4	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 5	REV 13	750-068822	CMUIAM9BAC	QFX10000-36Q
PIC 0		BUILTIN		
FPC 6	REV 41	750-071976	CMUIANABAB	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 7	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 8	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 9	REV 41	750-071976	CMUIANABAB	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 10	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 11	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 13	REV 41	750-071976	CMUIANABAB	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 15	REV 37	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
Power Supply 0	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 1	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 2	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 3	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 4	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 5	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 6	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 7	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 8	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 9	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Fan Tray 0				QFX5100-FAN-AFO
Fan Tray 1				QFX5100-FAN-AFO
SIB 0	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 1	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 2	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 3	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 4	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 5	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
FPD Board	REV 07	711-054687		

show chassis hardware detail (EX9251 Switch)

```
user@switch> show chassis hardware
```

```
Hardware inventory:
Item              Version  Part number  Serial number  Description
Chassis                               BLANK          EX9251
Routing Engine 0          BUILTIN      BUILTIN        RE-S-2X00x6
CB 0                    REV 05      750-069579    CAGT1382      EX9251
FPC 0                   BUILTIN      BUILTIN        MPC
  PIC 0                 BUILTIN      BUILTIN        4XQSFP28 PIC
    Xcvr 0              REV 01      740-044512    APF14500007NHC QSFP+-40G-CU50CM
    Xcvr 2              REV 01      740-046565    QH21035H      QSFP+-40G-SR4
  PIC 1                 BUILTIN      BUILTIN        8XSFP PIC
    Xcvr 0              REV 01      740-031980    AA15393URH7   SFP+-10G-SR
    Xcvr 1              REV 01      740-031980    AA162832LVG   SFP+-10G-SR
    Xcvr 2              REV 01      740-031980    MXA0NKJ       SFP+-10G-SR
    Xcvr 3              REV 01      740-031980    MXA0K75       SFP+-10G-SR
    Xcvr 4              REV 01      740-021308    MXA138L       SFP+-10G-SR
    Xcvr 5              REV 01      740-021308    13T511102684 SFP+-10G-SR
    Xcvr 6              REV 01      740-021308    MXA138E       SFP+-10G-SR
    Xcvr 7              REV 01      740-021308    MXA152N       SFP+-10G-SR
PEM 0                  REV 02      740-070749    1F186390060   AC AFO 650W PSU
PEM 1                  REV 02      740-070749    1F186390045   AC AFO 650W PSU
Fan Tray 0                                           Fan Tray, Front to Back
Airflow - AFO
Fan Tray 1                                           Fan Tray, Front to Back
Airflow - AFO
```

show chassis hardware extensive (T640 Router)

```
user@host> show chassis hardware extensive
```

```
Hardware inventory:
Item              Version  Part number  Serial number  Description
Chassis                               T640
Jedec Code:      0x7fb0          EEPROM Version: 0x01
P/N:             .....          S/N:             .....
Assembly ID:     0x0507          Assembly Version: 00.00
Date:            00-00-0000      Assembly Flags:   0x00
Version:         .....
ID: Gibson LCC Chassis
Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
```

```

Address 0x00: 7f b0 01 ff 05 07 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane          REV 04    710-002726    AX5633
Jedec Code:      0x7fb0          EEPROM Version:    0x01
P/N:             710-002726.      S/N:          AX5633.
Assembly ID:     0x0127          Assembly Version: 01.04
Date:           06-27-2001       Assembly Flags: 0x00
Version:        REV 04.....
ID: Gibson Backplane
Board Information Record:
Address 0x00: ad 01 08 00 00 90 69 0e f8 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 01 27 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 30 32 37 32 36 00 00
Address 0x20: 53 2f 4e 20 41 58 35 36 33 33 00 00 00 1b 06 07
Address 0x30: d1 ff ff ff ad 01 08 00 00 90 69 0e f8 00 ff ff
Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM GBUS          REV 02    710-002901    HE3245
...
FPM Display       REV 02    710-002897    HA4873
...
CIP               REV 05    710-002895    HA4729
...
PEM 1             RevX02    740-002595    MD21815          Power Entry Module
...
SCG 0             REV 04    710-003423    HF6023
...
SCG 1             REV 04    710-003423    HF6061
...
Routing Engine 0  REV 01    740-005022    210865700292    RE-3.0
...
CB 0              REV 06    710-002728    HE3614
...
FPC 1             REV 01    710-002385    HE3009          FPC Type 1
...              REV 06    710-001726    HC0010

```

show chassis hardware interconnect-device (QFabric Systems)

```
user@switch> show chassis hardware interconnect-device interconnect1
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis	REV 07			QFX_olive
Midplane	REV 07	750-021261	BH0208188289	QFX Midplane
CB 0	REV 07	750-021261	BH0208188289	QFXIC08-CB4S

show chassis hardware lcc (TX Matrix Router)

```
user@host> show chassis hardware lcc 0
```

```
lcc0-re0:
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			65751	T640
Midplane	REV 03	710-005608	RA1408	T640 Backplane
FPM GBUS	REV 09	710-002901	RA2784	T640 FPM Board
FPM Display	REV 05	710-002897	RA2825	FPM Display
CIP	REV 06	710-002895	HT0684	T Series CIP
PEM 0	Rev 11	740-002595	PM18483	Power Entry Module
PEM 1	Rev 11	740-002595	qbl3984	Power Entry Module
SCG 0	REV 11	710-003423	HT0022	T640 Sonet Clock Gen.
Routing Engine 0	REV 13	740-005022	210865700363	RE-3.0 (RE-600)
CB 0	REV 03	710-007655	HW1195	Control Board (CB-T)
FPC 1	REV 05	710-007527	HM3245	FPC Type 2
CPU	REV 14	710-001726	HM1084	FPC CPU
PIC 0	REV 02	750-007218	AZ1112	2x OC-12 ATM2 IQ, SMIR
PIC 1	REV 02	750-007745	HG3462	4x OC-3 SONET, SMIR
PIC 2	REV 14	750-001901	BA5390	4x OC-12 SONET, SMIR
PIC 3	REV 09	750-008155	HS3012	2x G/E IQ, 1000 BASE
SFP 0		NON-JNPR	P1186TY	SFP-S
SFP 1	REV 01	740-007326	P11WLTF	SFP-SX
MMB 1	REV 02	710-005555	HL7514	MMB-288mbit
PPB 0	REV 04	710-003758	HM4405	PPB Type 2
PPB 1	REV 04	710-003758	AV1960	PPB Type 2
FPC 2	REV 08	710-010154	HZ3578	E-FPC Type 3
CPU	REV 05	710-010169	HZ3219	FPC CPU-Enhanced
PIC 0	REV 02	750-009567	HX2882	1x 10GE(LAN), XENPAK
SFP 0	REV 01	740-009898	USC202U709	XENPAK-LR
PIC 1	REV 03	750-003336	HJ9954	4x OC-48 SONET, SMSR
PIC 2	REV 01	750-004535	HC0235	1x OC-192 SM SR1
PIC 3	REV 07	750-007141	HX1699	10x 1GE(LAN), 1000 BASE
SFP 0	REV 01	740-007326	2441042	SFP-SX
SFP 1	REV 01	740-007326	2441027	SFP-SX

MMB 0	REV 03	710-010171	HV2365	MMB-5M3-288mbit
MMB 1	REV 03	710-010171	HZ3888	MMB-5M3-288mbit
SPMB 0	REV 09	710-003229	HW5245	T Series Switch CPU
SIB 3	REV 07	710-005781	HR5927	SIB-L8-F16
B Board	REV 06	710-005782	HR5971	SIB-L8-F16 (B)
SIB 4	REV 07	710-005781	HR5903	SIB-L8-F16
B Board	REV 06	710-005782	HZ5275	SIB-L8-F16 (B)

show chassis hardware models (MX2010 Router)

user@host > show chassis hardware models

Hardware inventory:				
Item	Version	Part number	Serial number	FRU model number
FPM Board	REV 06	711-032349	ZX8744	711-032349
PSM 4	REV 0C	740-033727	VK00254	0000000000000000000000
PSM 5	REV 0B	740-033727	VG00015	0000000000000000000000
PSM 6	REV 0B	740-033727	VH00097	0000000000000000000000
PSM 7	REV 0C	740-033727	VJ00151	0000000000000000000000
PSM 8	REV 0C	740-033727	VJ00149	0000000000000000000000
PDM 0	REV 0B	740-038109	WA00008	
PDM 1	REV 0B	740-038109	WA00014	
Routing Engine 0	REV 02	740-041821	9009094134	RE-S-1800X4-16G-S
Routing Engine 1	REV 02	740-041821	9009094141	RE-S-1800X4-16G-S
CB 0	REV 08	750-040257	CAAB3491	750-040257
CB 1	REV 08	750-040257	CAAB3489	750-040257
SFB 0	REV 06	711-032385	ZV1828	711-032385
SFB 1	REV 07	711-032385	ZZ2568	711-032385
SFB 2	REV 07	711-032385	ZZ2563	711-032385
SFB 3	REV 07	711-032385	ZZ2564	711-032385
SFB 4	REV 07	711-032385	ZZ2580	711-032385
SFB 5	REV 07	711-032385	ZZ2579	711-0323856
SFB 6	REV 07	711-032385	CAAB4882	711-044170
SFB 7	REV 07	711-032385	CAAB4898	711-044170
FPC 0	REV 33	750-028467	CAAB1919	MPC-3D-16XGE-SFPP
FPC 1	REV 21	750-033205	ZG5027	MX-MPC3-3D
MIC 0	REV 03	750-033307	ZV6299	MIC3-3D-10XGE-SFPP
MIC 1	REV 03	750-033307	ZV6268	MIC3-3D-10XGE-SFPP
FPC 8	REV 22	750-031089	ZT9746	MX-MPC2-3D
MIC 0	REV 26	750-028392	ABBS1150	MIC-3D-20GE-SFP
MIC 1	REV 26	750-028387	ABBR9582	MIC-3D-4XGE-XFP
FPC 9	REV 11	750-036284	ZL3591	MPCE-3D-16XGE-SFPP
ADC 0	REV 05	750-043596	CAAC2073	750-043596
ADC 1	REV 01	750-043596	ZV4117	750-043596

ADC 8	REV 01	750-043596	ZV4107	750-043596
ADC 9	REV 02	750-043596	ZW1555	750-043596
Fan Tray 0	REV 2A	760-046960	ACAY0015	
Fan Tray 1	REV 2A	760-046960	ACAY0019	
Fan Tray 2	REV 2A	760-046960	ACAY0020	
Fan Tray 3	REV 2A	760-046960	ACAY0021	

show chassis hardware node-device (QFabric Systems)

user@switch> show chassis hardware node-device node1

Routing Engine 0	BUILTIN	BUILTIN	QFX Routing Engine
node1	REV 05	711-032234	ED3694 QFX3500-48S4Q-AFI
CPU		BUILTIN	BUILTIN
PIC 0		BUILTIN	BUILTIN
Xcvr 8	REV 01	740-030658	AD0946A028B
			FPC CPU
			48x 10G-SFP+
			SFP+-10G-USR

show chassis hardware scc (TX Matrix Router)

user@host> show chassis hardware scc

```
scc-re0:
-----
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               TX Matrix
Midplane      REV 04    710-004396   RB0014         SCC Midplane
FPM GBUS      REV 04    710-004617   HW9141         SCC FPM Board
FPM Display   REV 04    710-004619   HS5950         SCC FPM
CIP 0         REV 01    710-010218   HV9151         SCC CIP
CIP 1         REV 01    710-010218   HV9152         SCC CIP
PEM 1         Rev 11    740-002595   QB13977        Power Entry Module
Routing Engine 0 REV 05    740-008883   P11123900153  RE-4.0 (RE-1600)
CB 0          REV 01    710-011709   HR5964         Control Board (CB-TX)
SPMB 0        REV 09    710-003229   HW5293         T Series Switch CPU
SIB 3
SIB 4         REV 01    710-005839   HW1177         SIB-S8-F16
B Board       REV 01    710-005840   HW1202         SIB-S8-F16 (B)
```

show chassis hardware sfc (TX Matrix Plus Router)

user@host> show chassis hardware sfc 0

sfc0-re0:

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN112F007AHB	TXP
Midplane	REV 05	710-022574	TS4027	SFC Midplane
FPM Display	REV 03	710-024027	DX0282	TXP FPM Display
CIP 0	REV 04	710-023792	DW4889	TXP CIP
CIP 1	REV 04	710-023792	DW4887	TXP CIP
PEM 0	Rev 07	740-027463	UM26368	Power Entry Module
Routing Engine 0	REV 01	740-026942	737A-1064	SFC RE
Routing Engine 1	REV 01	740-026942	737A-1082	SFC RE
CB 0	REV 09	710-022606	DW6099	SFC Control Board
CB 1	REV 09	710-022606	DW6096	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 04	710-022600	DX0841	F13 SIB
B Board	REV 03	710-023431	DX0966	F13 SIB Mezz
SIB F13 1	REV 04	750-024564	DW5776	F13 SIB
B Board	REV 03	710-023431	DW9028	F13 SIB
SIB F13 3	REV 04	750-024564	DW5762	F13 SIB
B Board	REV 03	710-023431	DW9059	F13 SIB
SIB F13 4	REV 04	750-024564	DW5797	F13 SIB
B Board	REV 03	710-023431	DW9041	F13 SIB
SIB F13 6	REV 04	750-024564	DW5770	F13 SIB
B Board	REV 03	710-023431	DW9079	F13 SIB Mezz
SIB F13 7	REV 04	750-024564	DW5758	F13 SIB
B Board	REV 03	710-023431	DW9047	F13 SIB
SIB F13 8	REV 04	750-024564	DW5761	F13 SIB
B Board	REV 03	710-023431	DW9043	F13 SIB Mezz
SIB F13 9	REV 04	750-024564	DW5754	F13 SIB
B Board	REV 03	710-023431	DW9078	F13 SIB Mezz
SIB F13 11	REV 04	710-022600	DX0826	F13 SIB
B Board	REV 03	710-023431	DX0967	F13 SIB Mezz
SIB F13 12	REV 04	750-024564	DW5794	F13 SIB
B Board	REV 03	710-023431	DW9044	F13 SIB Mezz
SIB F2S 0/0	REV 05	710-022603	DW7897	F2S SIB
B Board	REV 05	710-023787	DW7657	NEO PMB
SIB F2S 0/2	REV 05	710-022603	DW7833	F2S SIB
B Board	REV 05	710-023787	DW7526	NEO PMB
SIB F2S 0/4	REV 05	710-022603	DW7875	F2S SIB
B Board	REV 05	710-023787	DW7588	NEO PMB
SIB F2S 0/6	REV 05	710-022603	DW7860	F2S SIB
B Board	REV 05	710-023787	DW7589	NEO PMB

SIB F2S 1/0	REV 04	710-022603	DW4820	F2S SIB
B Board	REV 05	710-023787	DW8510	NEO PMB
SIB F2S 1/2	REV 05	710-022603	DW7849	F2S SIB
B Board	REV 05	710-023787	DW7525	NEO PMB
SIB F2S 1/4	REV 05	710-022603	DW7927	F2S SIB
B Board	REV 05	710-023787	DW7556	F2S SIB Mezz
SIB F2S 1/6	REV 05	710-022603	DW7866	F2S SIB
B Board	REV 05	710-023787	DW7651	NEO PMB
SIB F2S 2/0	REV 05	710-022603	DW7880	F2S SIB
B Board	REV 05	710-023787	DW7523	NEO PMB
SIB F2S 2/2	REV 05	710-022603	DW7895	F2S SIB
B Board	REV 05	710-023787	DW7591	NEO PMB
SIB F2S 2/4	REV 05	710-022603	DW7907	F2S SIB
B Board	REV 05	710-023787	DW7590	NEO PMB
SIB F2S 2/6	REV 05	710-022603	DW7785	F2S SIB
B Board	REV 05	710-023787	DW7524	NEO PMB
SIB F2S 3/0	REV 05	710-022603	DW7782	F2S SIB
B Board	REV 05	710-023787	DW7634	NEO PMB
SIB F2S 3/2	REV 05	710-022603	DW7793	F2S SIB
B Board	REV 05	710-023787	DW7548	NEO PMB
SIB F2S 3/4	REV 05	710-022603	DW7779	F2S SIB
B Board	REV 05	710-023787	DW7587	NEO PMB
SIB F2S 3/6	REV 05	710-022603	DW7930	F2S SIB
B Board	REV 05	710-023787	DW7505	NEO PMB
SIB F2S 4/0	REV 05	710-022603	DW7867	F2S SIB
B Board	REV 05	710-023787	DW7656	NEO PMB
SIB F2S 4/2	REV 05	710-022603	DW7917	F2S SIB
B Board	REV 05	710-023787	DW7640	NEO PMB
SIB F2S 4/4	REV 05	710-022603	DW7929	F2S SIB
B Board	REV 05	710-023787	DW7643	NEO PMB
SIB F2S 4/6	REV 05	710-022603	DW7870	F2S SIB
B Board	REV 05	710-023787	DW7635	NEO PMB
Fan Tray 0	REV 06	760-024497	DV7831	Front Fan Tray
Fan Tray 1	REV 06	760-024497	DV9614	Front Fan Tray
Fan Tray 2	REV 06	760-024502	DV9618	Rear Fan Tray
Fan Tray 3	REV 06	760-024502	DV9616	Rear Fan Tray
Fan Tray 4	REV 06	760-024502	DV7807	Rear Fan Tray
Fan Tray 5	REV 06	760-024502	DV7828	Rear Fan Tray

show flight-recorder status

Syntax

```
show flight-recorder status
```

Release Information

Command introduced in Junos OS Release 18.2R1 on all platforms.

Description

Display the current status of the flight recorder tool and associated parameters, such as the running status of the tool, and the current data snapshot list.

Options

This command has no options.

Required Privilege Level

view

RELATED DOCUMENTATION

| [request flight-recorder set high-cpu](#) | [194](#)

List of Sample Output

[show flight-recorder status on page 295](#)

Output Fields

[Table 10 on page 294](#) lists the output fields for the **show flight-recorder status** command. Output fields are listed in the approximate order in which they appear.

Table 10: show flight-recorder status Output Fields

Field Name	Field Description
Flight-recorder status	State of the flight recorder tool: <ul style="list-style-type: none">• Running—The flight recorder tool is enabled using the request flight-recorder set high-cpu command.• Not Running—The flight recorder tool is not enabled. By default, the flight recorder tool is disabled.

Table 10: show flight-recorder status Output Fields (*continued*)

Field Name	Field Description
Recent Parameter Data	<p>Information about configured parameters for the flight recorder tool:</p> <ul style="list-style-type: none"> • Cpu-threshold—Specify the maximum value of CPU utilization in percentage, beyond which the collection of data is triggered. • Polling-frequency—Specify the time in seconds for polling for high CPU utilization. • Backoff-duration—Specify the time interval in seconds between two snapshots of data. • Num-snapshots—Specify the number of snapshots of data to be collected before quitting the collection process.
Flags set	<p>Information about additional flags configured for the flight recorder tool:</p> <ul style="list-style-type: none"> • Collect-core—Perform snapshot collection of the running core with every snapshot of data taken. • Logical System—Enable data collection on logical systems.
Snapshot Directory	<p>Log file that is recorded and saved in the flight recorder directory.</p> <p>The recorded snapshots and core log files are saved in a folder under the <code>/var/log/flight_recorder/</code> directory. The folder format is Flr_MONTH_DD_YYYY_HH:MM:SS; for example, Flr_May_09_2018_02:20:50.</p>
List of snapshots	List of log files recorded and saved under the flight recorder directory.

Sample Output

show flight-recorder status

```
user@host> show flight-recorder status
```

```
Flight-recorder status: Not Running!
```

```
Recent Parameter Data:
```

```
Cpu-threshold      10
Polling-frequency   5
Backoff-duration    10
Num-snapshots       3
```

```
Flags set:
```

```
Collect-core flag is set
Logical System flag is Not set (default)

Snapshot Directory : Flr_Feb_22_2018_13:26:41

List of snapshots:
  flr_2018-02-22_13:26:41.txt
  flr_2018-02-22_13:27:04.txt
  flr_2018-02-22_13:27:28.txt
```

show host

List of Syntax

[Syntax on page 297](#)

[Syntax \(Junos OS Evolved\) on page 297](#)

Syntax

```
show host hostname  
<routing-instance mgmt_junos>  
<server server-name>
```

Syntax (Junos OS Evolved)

```
show host hostname  
<routing-instance mgmt_junos>  
<server server-name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

routing-instance mgmt_junos option introduced in Junos OS Evolved Release 18.3R1.

routing-instance mgmt_junos option introduced in Junos OS Release 19.2R1.

Description

Display Domain Name System (DNS) hostname information.

Options

hostname—Hostname or address.

routing-instance mgmt_junos—(Optional) Side host server that is running.

server *server-name*—(Optional) Name server to use.

Additional Information

The **show host** command displays the raw data received from the name server.

Required Privilege Level

view

List of Sample Output

[show host on page 298](#)

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 log

List of Syntax

[Syntax on page 299](#)

[Syntax \(QFX Series and OCX Series\) on page 299](#)

[Syntax \(TX Matrix Router\) on page 299](#)

Syntax

```
show log  
<filename | user <username>>
```

Syntax (QFX Series and OCX Series)

```
show log filename  
<device-type (device-id | device-alias)>
```

Syntax (TX Matrix Router)

```
show log  
<all-lcc | lcc number | scc>  
<filename | user <username>>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Option *device-type (device-id | device-alias)* is introduced in Junos OS Release 13.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

List log files, display log file contents, or display information about users who have logged in to the router or switch.

NOTE: On MX Series routers, modifying a configuration to replace a service interface with another service interface is treated as a catastrophic event. When you modify a configuration, the entire configuration associated with the service interface—including NAT pools, rules, and service sets—is deleted and then re-created for the newly specified service interface. If there are active sessions associated with the service interface that is being replaced, these sessions are deleted and the NAT pools are then released, which leads to the generation of the NAT_POOL_RELEASE system log messages. However, because NAT pools are already deleted as a result of the catastrophic configuration change and no longer exist, the NAT_POOL_RELEASE system log messages are not generated for the changed configuration.

Options

none—List all log files.

<all-lcc | lcc *number* | scc>—(Routing matrix only)(Optional) Display logging information about all T640 routers (or line-card chassis) or a specific T640 router (replace ***number*** with a value from 0 through 3) connected to a TX Matrix router. Or, display logging information about the TX Matrix router (or switch-card chassis).

device-type—(QFabric system only) (Optional) Display log messages for only one of the following device types:

- **director-device**—Display logs for Director devices.
- **infrastructure-device**—Display logs for the logical components of the QFabric system infrastructure, including the diagnostic Routing Engine, fabric control Routing Engine, fabric manager Routing Engine, and the default network Node group and its backup (NW-NG-0 and NW-NG-0-backup).
- **interconnect-device**—Display logs for Interconnect devices.
- **node-device**—Display logs for Node devices.

NOTE: If you specify the **device-type** optional parameter, you must also specify either the **device-id** or **device-alias** optional parameter.

(*device-id* | *device-alias*)—If a device type is specified, display logs for a device of that type. Specify either the device ID or the device alias (if configured).

filename—(Optional) Display the log messages in the specified log file. For the routing matrix, the filename must include the chassis information.

NOTE: The *filename* parameter is mandatory for the QFabric system. If you did not configure a syslog filename, specify the default filename of **messages**.

user <username>—(Optional) Display logging information about users who have recently logged in to the router or switch. If you include **username**, display logging information about the specified user.

Required Privilege Level

trace

RELATED DOCUMENTATION

| [syslog \(System\)](#)

List of Sample Output

[show log on page 301](#)

[show log filename on page 302](#)

[show log filename \(QFabric System\) on page 302](#)

[show log user on page 303](#)

Sample Output

show log

user@host> **show log**

```
total 57518
-rw-r--r-- 1 root bin      211663 Oct  1 19:44 dcd
-rw-r--r-- 1 root bin      999947 Oct  1 19:41 dcd.0
-rw-r--r-- 1 root bin      999994 Oct  1 17:48 dcd.1
-rw-r--r-- 1 root bin      238815 Oct  1 19:44 rpd
-rw-r--r-- 1 root bin     1049098 Oct  1 18:00 rpd.0
-rw-r--r-- 1 root bin      1061095 Oct  1 12:13 rpd.1
-rw-r--r-- 1 root bin      1052026 Oct  1 06:08 rpd.2
-rw-r--r-- 1 root bin      1056309 Sep 30 18:21 rpd.3
-rw-r--r-- 1 root bin      1056371 Sep 30 14:36 rpd.4
-rw-r--r-- 1 root bin      1056301 Sep 30 10:50 rpd.5
-rw-r--r-- 1 root bin      1056350 Sep 30 07:04 rpd.6
```

```
-rw-r--r--  1 root  bin      1048876 Sep 30 03:21 rpd.7
-rw-rw-r--  1 root  bin      19656 Oct  1 19:37 wttmp
```

show log filename

user@host> show log rpd

```
Oct  1 18:00:18 trace_on: Tracing to ?/var/log/rpd? started
Oct  1 18:00:18 EVENT <MTU> ds-5/2/0.0 index 24 <Broadcast PointToPoint Multicast
Oct  1 18:00:18
Oct  1 18:00:19 KRT recv len 56 V9 seq 148 op add Type route/if af 2 addr 192.0.2.21
nhop type local nhop 192.0.2.21
Oct  1 18:00:19 KRT recv len 56 V9 seq 149 op add Type route/if af 2 addr 192.0.2.22
nhop type unicast nhop 192.0.2.22
Oct  1 18:00:19 KRT recv len 48 V9 seq 150 op add Type ifaddr index 24 devindex
43
Oct  1 18:00:19 KRT recv len 144 V9 seq 151 op chnge Type ifdev devindex 44
Oct  1 18:00:19 KRT recv len 144 V9 seq 152 op chnge Type ifdev devindex 45
Oct  1 18:00:19 KRT recv len 144 V9 seq 153 op chnge Type ifdev devindex 46
Oct  1 18:00:19 KRT recv len 1272 V9 seq 154 op chnge Type ifdev devindex 47
...
```

show log filename (QFabric System)

user@qfabric> show log messages

```
Mar 28 18:00:06 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:06 ED1486
chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 2159)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1486
chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 2, jnxFruL3Index 0,
jnxFruName PIC: @ 0/1/*, jnxFruType 11, jnxFruSlot 0, jnxFruOfflineReason 2,
jnxFruLastPowerOff 0, jnxFruLastPowerOn 2191)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1492
chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 242726)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1492
chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
```



```
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 2, jnxFruL3Index 0,
jnxFruName PIC: @ 0/1/*, jnxFruType 11, jnxFruSlot 0, jnxFruOfflineReason 2,
jnxFruLastPowerOff 0, jnxFruLastPowerOn 242757)
Mar 28 18:00:16 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:16 ED1486 file:
  UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:00:27 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:27 ED1486 file:
  UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:00:50 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:50
_DCF_default___NW-INE-0_RE0_ file: UI_COMMIT: User 'root' requested 'commit'
operation (comment: none)
Mar 28 18:00:50 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:50
_DCF_default___NW-INE-0_RE0_ file: UI_COMMIT: User 'root' requested 'commit'
operation (comment: none)
Mar 28 18:00:55 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:55 ED1492 file:
  UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:01:10 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:01:10 ED1492 file:
  UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:02:37 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:02:37 ED1491
chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 33809)
```

show log user

```
user@host> show log user
```

usera	mg2546		Thu Oct 1 19:37	still logged in
usera	mg2529		Thu Oct 1 19:08 - 19:36	(00:28)
usera	mg2518		Thu Oct 1 18:53 - 18:58	(00:04)
root	mg1575		Wed Sep 30 18:39 - 18:41	(00:02)
root	ttyp2	aaa.bbbb.com	Wed Sep 30 18:39 - 18:41	(00:02)
userb	ttyp1	192.0.2.0	Wed Sep 30 01:03 - 01:22	(00:19)

show system connections

List of Syntax

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[Syntax \(MX Series Router\) on page 305](#)

[Syntax \(QFX Series\) on page 305](#)

[Syntax \(OCX Series\) on page 305](#)

[Syntax \(Junos OS Evolved\) on page 305](#)

Syntax

```
show system connections
<extensive>
<inet | inet6>
<show-routing-instances>
```

Syntax (EX Series)

```
show system connections
<extensive>
<all-members>
<inet | inet6>
<local>
<member member-id>
<show-routing-instances>
```

Syntax (TX Matrix Router)

```
show system connections
<extensive>
<all-chassis | all-lcc | lcc number | scc>
<inet | inet6>
<show-routing-instances>
```

Syntax (TX Matrix Plus Router)

```
show system connections
<extensive>
<all-chassis | all-lcc | lcc number | sfc number>
```

```
<inet | inet6>
<show-routing-instances>
```

Syntax (MX Series Router)

```
show system connections
<extensive>
<all-members>
<inet | inet6>
<local>
<member member-id>
<show-routing-instances>
```

Syntax (QFX Series)

```
show system connections
<extensive>
<inet>
<infrastructure name>
<interconnect-device name>
<node-group name>
<show-routing-instances>
```

Syntax (OCX Series)

```
show system connections
<extensive>
<inet>
<show-routing-instances>
```

Syntax (Junos OS Evolved)

```
show system connections
<inet | inet6>
<node node-name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Options **extensive** and **show-routing-instance** deprecated in Junos OS Evolved Release 17.3.

node option introduced in Junos OS Evolved Release 18.3R1.

Description

Display information about the active IP sockets on the Routing Engine. Use this command to verify which servers are active on a system and what connections are currently in progress.

Options

none—Display information about all active IP sockets on the Routing Engine.

extensive—(Optional) Display exhaustive system process information, which, for TCP connections, includes the TCP control block. This option is useful for debugging TCP connections.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system connection activity for all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system connection activity for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system connection activity for all connected T1600 or T4000 LCCs

all-members—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for all members of the Virtual Chassis configuration.

inet | inet6—(Optional) Display IPv4 connections or IPv6 connections, respectively.

infrastructure name—(QFabric systems only) (Optional) Display system connection activity for the fabric control Routing Engines or fabric manager Routing Engines.

interconnect-device name—(QFabric systems only) (Optional) Display system connection activity for the Interconnect device.

lcc number—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system connection activity for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system connection activity for a specific router that is connected to the TX Matrix Plus router.

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

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

local—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for the local Virtual Chassis member.

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

node *node-name*—(Junos OS Evolved only) (Optional) Display system connection activity for the specified node.

node-group *name*—(QFabric systems only) (Optional) Display system connection activity for the Node group.

scc—(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix Plus router.

show-routing-instances—(Optional) Display routing instances.

Additional Information

By default, when you issue the **show system connections** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

RELATED DOCUMENTATION

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show system connections on page 308](#)

[show system connections extensive on page 309](#)

[show system connections show-routing-instances on page 311](#)

Output Fields

[Table 11 on page 308](#) describes the output fields for the **show system connections** command. Output fields are listed in the approximate order in which they appear.

Table 11: show system connections Output Fields

Field Name	Field Description
Proto	Protocol of the socket: IP , TCP , or UDP for IPv4 or IPv6.
Recv-Q	Number of input bytes received by the protocol and waiting to be processed by the application.
Send-Q	Number of output bytes sent by the application and waiting to be processed by the protocol.
Local Address	Local address and port of the socket, separated by a period. An asterisk (*) indicates that the bound address is the wildcard address. Server sockets typically have the wildcard address and a well-known port bound to them.
Foreign Address	Foreign address and port of the socket, separated by a period. An asterisk (*) indicates that the address or port is a wildcard.
Routing Instance	(Displayed only when the show-routing-instance option is used.) Routing instances associated with active IP sockets on the Routing Engine.
(state)	For TCP, the protocol state of the socket.

Sample Output

show system connections

user@host> **show system connections**

```
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         (state)
tcp      0      2 192.0.2.16.513          192.0.2.254.894        ESTABLISHED
tcp      0      0 192.0.2.16.513          192.0.2.195.945        ESTABLISHED
tcp      0      0 *.23                    *.*                      LISTEN
tcp      0      0 *.22                    *.*                      LISTEN
tcp      0      0 *.513                    *.*                      LISTEN
tcp00 *.514      *.*                      LISTEN
tcp 0 0*.21      *.*                      LISTEN
tcp00 *.79      *.*                      LISTEN
tcp 00 *.1023    *.*                      LISTEN
```

```

tcp 00 *.111      *.*                LISTEN
udp00192.192.0.2.1634      192.0.2.249.2049
udp00192.192.0.2.1627      192.0.2.254.2049
udp00192.192.0.2.1371      192.0.2.195.2049
udp00*.*      *.*
udp00*.9999    *.*
udp00 *.161    *.*
udp00192.192.0.2.1039      192.0.2.16.1023
udp00192.192.0.2.1038      192.0.2.16.1023
udp 00 192.0.2.16.1037      192.0.2.16.1023
udp00 192.0.2.16.1036      192.0.2.16.1023
udp00*.1022    *.*
udp00*.1023    *.*
udp00*.111     *.*
udp00*.*      *.*

```

show system connections extensive

user@host> show system connections extensive

```

Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
      (state)
tcp4      0      6 192.0.2.15.23 192.0.2.138.3013
      ESTABLISHED
      sndsbcc:      6 sndsbmbcnt:      256 sndsbmbmax:      272000
      sndsblowat:      2048 sndsbhiwat:      34000
      rcvsbcc:      0 rcvsbmbcnt:      0 rcvsbmbmax:      533120
      rcvsblowat:      1 rcvsbhiwat:      66640
      proc id:      0 proc name:
      iss: 2566994072 sndup: 2566994491
      snduna: 2566994491 sndnxt: 2566994494 sndwnd:      64094
      sndmax: 2566994494 sndcwnd:      6589 sndssthresh:      2720
      irs: 236981199 rcvup: 236981325
      rcvnxt: 236981327 rcvadv: 237046862 rcvwnd:      66640
      rtt: 140058623 srtt:      15519 rttv:      908
      rxtcur:      1200 rxtshift:      0 rtseq: 2566994491
      rttmin:      1000 mss:      1360
      flags: SACK_PERMIT [0x2000200]
tcp4      0      0 10.255.165.93.179
10.255.165.203.65141 ESTABLISHED
      sndsbcc:      0 sndsbmbcnt:      0 sndsbmbmax:      131072
      sndsblowat:      2048 sndsbhiwat:      16384

```

```

rcvsbcc:          0 rcvsbmbcnt:          0 rcvsbmbmax:      131072
rcvsblowat:       1 rcvsbhiwat:          16384
proc id:          0 proc name:
    iss: 2555961065    sndup: 2555995917
    snduna: 2555995917    sndnxt: 2555995917    sndwnd:      16384
    sndmax: 2555995917    sndcwnd:      1000 sndssthresh: 1073725440
    irs: 2123825753    rcvup: 2123860681
    rcvnxt: 2123860681    rcvadv: 2123877065    rcvwnd:      16384
    rtt:          0    srtt:          3309    rttv:          72
    rxtcur:      1200    rxtshift:          0    rtseq: 2555995898
    rttmin:      1000    mss:          500
    flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x3e0]
tcp4          0          0 10.255.165.203.65141          10.255.165.93.179
                ESTABLISHED
    sndsbcc:          0 sndsbmbcnt:          0 sndsbmbmax:      131072
    sndsblowat:      2048 sndsbhiwat:          16384
    rcvsbcc:          0 rcvsbmbcnt:          0 rcvsbmbmax:      131072
    rcvsblowat:      1 rcvsbhiwat:          16384
    proc id:        5022 proc name:      rpd
    iss: 2123825753    sndup: 2123860662
    snduna: 2123860681    sndnxt: 2123860681    sndwnd:      16384
    sndmax: 2123860681    sndcwnd:      1000 sndssthresh: 1073725440
    irs: 2555961065    rcvup: 2555995917
    rcvnxt: 2555995917    rcvadv: 2556012301    rcvwnd:      16384
    rtt:          0    srtt:          3279    rttv:          22
    rxtcur:      1200    rxtshift:          0    rtseq: 2123860662
    rttmin:      1000    mss:          500
    flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x100003e0]
tcp4          0          0 10.255.165.203.179
10.255.165.113.52404          ESTABLISHED
    sndsbcc:          0 sndsbmbcnt:          0 sndsbmbmax:      131072
    sndsblowat:      2048 sndsbhiwat:          16384
    rcvsbcc:          0 rcvsbmbcnt:          0 rcvsbmbmax:      131072
    rcvsblowat:      1 rcvsbhiwat:          16384
    proc id:        0 proc name:
    iss: 1109297190    sndup: 1109332099
    snduna: 1109332118    sndnxt: 1109332118    sndwnd:      16384
    sndmax: 1109332118    sndcwnd:      1000 sndssthresh: 1073725440
    irs: 1476831634    rcvup: 1476866449
    rcvnxt: 1476866449    rcvadv: 1476882833    rcvwnd:      16384
    rtt:          0    srtt:          3235    rttv:          18
    rxtcur:      1200    rxtshift:          0    rtseq: 1109332099
    rttmin:      1000    mss:          500
    flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x3e0]

```


show system connections show-routing-instances

```
user@host> show system connections show-routing-instances
```

```
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q Local Address          Foreign Address         Routing Instance
      (state)
tcp4      0      0 192.0.2.204.23         192.0.2.19.4267        default
      ESTABLISHED
tcp4      0      0 192.0.2.204.58540      10.209.7.138.23        default
      ESTABLISHED
tcp4      0      0 192.0.2.204.23         192.0.2.19.1098        default
      ESTABLISHED
tcp4      0      0 192.0.2.1.57668        192.0.2.1.179          default
      ESTABLISHED
tcp4      0      0 192.0.2.1.179          192.0.2.1.49209        default
      ESTABLISHED
tcp4      0      0 192.0.2.1.6234         192.0.2.17.1024
__juniper_private1__    ESTABLISHED
tcp4      0      0 192.0.2.4.9000         192.0.24.59103
__juniper_private1__    ESTABLISHED
tcp4      0      0 192.0.2.4.59103        192.0.2.4.9000
__juniper_private1__    ESTABLISHED
tcp4      0      0 *.32012                *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.9000                  *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.33007                 *.*
__juniper_private2__    LISTEN
tcp46     0      0 *.179                   *.*                     default
      LISTEN
tcp4      0      0 *.179                   *.*                     default
      LISTEN
tcp4      0      0 *.6154                  *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.6153                  *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.7000                  *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.6152                  *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.6156                  *.*
__juniper_private1__    LISTEN
tcp4      0      0 *.33005                 *.*
__juniper_private2__    LISTEN
```

```

tcp4      0      0 *.31343      *.*
__juniper_private1__ LISTEN
tcp4      0      0 *.31341      *.*
__juniper_private1__ LISTEN
tcp4      0      0 *.32003      *.*
__juniper_private2__ LISTEN
tcp4      0      0 *.666        *.*
__juniper_private1__ LISTEN
tcp4      0      0 *.38         *.*
__juniper_private1__ LISTEN
tcp4      0      0 *.3221       *.*          default
LISTEN

```

show system name-resolution

Syntax

```
show system name-resolution
```

Release Information

Command introduced in Junos OS Release 9.6.

Description

Display hostname-to-IP-address mappings.

Options

This command has no options.

Required Privilege Level

view

Output Fields

[Table 12 on page 313](#) lists the output fields for the **show system name-resolution** command. Output fields are listed in the approximate order in which they appear.

Table 12: show system name-resolution Output Fields

Field Name	Field Description
Last update	Date and time when the hostname-to-IP address mapping were last resolved.
Refresh interval	Interval for refreshing the cache with the updated hostname-to-IP address mappings.
Addresses	Resolved IP addresses based on the hostname-to-IP address mappings.
Error	Error message displayed if there is a DNS hostname lookup failure.
Last change	Timestamp for the last change in the hostname-to-IP address mappings.

show system name-resolution

```
user@host> show system name-resolution
```

Hostname to IP-address mappings:

```
-----  
Last update: Mon Sep 29 18:42:21 2008  
Refresh interval: 600 secs  
Host: ntpl  
  Addresses:  
    3.3.3.11  
  Last change: Mon Sep 29 18:42:20 2008  
Host: radauth1  
  Error: Host name lookup failure  
Last change: Mon Sep 29 18:42:20 2008  
Host: radacct1  
  Error: Host name lookup failure  
Host: snmpl  
  Addresses:  
    4.4.4.1  
    4.4.4.2  
  Last change: Mon Sep 29 18:45:20 2008  
Host: sys1  
  Addresses:  
    192.168.68.69  
  Last change: Mon Sep 29 18:42:21 2008
```

show version

List of Syntax

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[Syntax \(EX Series Switches\) on page 315](#)

[Syntax \(TX Matrix Router\) on page 315](#)

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[Syntax \(MX Series Router\) on page 315](#)

[Syntax \(QFX Series\) on page 316](#)

[Syntax \(Junos OS Evolved\) on page 316](#)

Syntax

```
show version
<brief | detail>
```

Syntax (EX Series Switches)

```
show version
<all-members>
<brief | detail>
<local>
<member member-id>
```

Syntax (TX Matrix Router)

```
show version
<brief | detail>
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show version
<all-chassis | all-lcc | lcc number | sfc number>
<brief | detail>
```

Syntax (MX Series Router)

```
show version
<brief | detail>
<all-members>
```

```
<local>
<member member-id>
```

Syntax (QFX Series)

```
show version
<brief | detail>
<component component-name | all>
```

Syntax (Junos OS Evolved)

```
show version
<brief | detail>
<node (all | node-name)>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.

node option introduced in Junos OS Evolved Release 18.3R1.

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.

The output for the **show version** command for Junos OS Evolved includes a **Junos Package** field that indicates the installation package name. From the prefix of this package name, you can decode which Junos OS architecture the device is running.

Table 13: Common Package Prefixes for Junos OS

Junos OS Package Prefix	Junos OS Architecture
jinstall-*	Junos OS for M Series, MX Series, T Series, TX Matrix, and TX Matrix Plus routers
junos-install-*	Junos OS based on an upgraded FreeBSD kernel instead of older versions of FreeBSD

Table 13: Common Package Prefixes for Junos OS (*continued*)

Junos OS Package Prefix	Junos OS Architecture
junos-vmhost-install-*	Junos OS with upgraded FreeBSD on a VM Host
junos-evo-install-*	Junos OS Evolved

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.

node (all | *node-name*)—(Optional) Display version information for the specified node or all nodes.

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 318](#)

[show version on page 319](#)

[show version \(Junos OS Evolved\) on page 320](#)

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 (Junos OS Evolved)

```
user@host> show version
```

```
Model: qfx5200-32c-32q

Junos: 18.3-20181119.2

Junos Package: junos-evo-install-qfx-ms-fixed-x86-64-18.3-20181119.2.iso

Yocto: 2.2.1

Linux Kernel: 4.8.28-WR2.2.1_standard
```

start shell

Syntax

```
start shell (csh | sh)
<user username>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Exit from the CLI environment and create a UNIX-level shell. To return to the CLI, type **exit** from the shell.

NOTE:

- To issue this command, the user must have the required login access privileges configured by including the **permissions** statement at the **[edit system login class *class-name*]** hierarchy level.
- UNIX wheel group membership or permissions are no longer required to issue this command.

Options

csh—Create a UNIX C shell.

sh—Create a UNIX Bourne shell.

user *username*—(Optional) Start the shell as another user.

Additional Information

When you are in the shell, the shell prompt has the following format:

```
username@hostname%
```

An example of the prompt is:

```
root@host%
```

Required Privilege Level

shell or maintenance

List of Sample Output

[start shell csh on page 322](#)

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>
```

System Software Monitoring Commands

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show system commit

Syntax

```
show system commit <revision | server>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Option **server** introduced in Junos OS Release 12.1 for the PTX Series router.

Option **revision** introduced in Junos OS Release 14.1.

Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Display the system commit history and any pending commit operation.

Options

none—Display the last 50 commit operations listed, most recent to first.

revision—(Optional) Display the revision number of the active configuration of the Routing Engine(s).

server— (Optional) Display commit server status.

NOTE: By default, the status of the commit server is “Not running”. The commit server starts running only when a commit job is added to the batch.

Required Privilege Level

view

RELATED DOCUMENTATION

clear system commit

show system commit revision

List of Sample Output

[show system commit on page 325](#)

[show system commit \(At a Particular Time\) on page 326](#)

[show system commit \(At the Next Reboot\) on page 326](#)

[show system commit \(Rollback Pending\) on page 326](#)

[show system commit \(QFX Series\) on page 326](#)

Output Fields

[Table 14 on page 325](#) describes the output fields for the **show system commit** command. Output fields are listed in the approximate order in which they appear.

Table 14: 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 database usage

Syntax

```
show system configuration database usage
```

Release Information

Command introduced in Junos OS Release 15.1.

Description

Display configuration database disk space usage statistics.

Options

This command has no options.

Required Privilege Level

maintenance

RELATED DOCUMENTATION

Overview for Junos OS

List of Sample Output

[show system configuration database usage on page 328](#)

Output Fields

[Table 15 on page 327](#) describes the output fields for the **show system configuration database usage** command. Output fields are listed in the approximate order in which they appear.

Table 15: show system configuration database usage Output Fields

Field Name	Field Description
Maximum size of the database	Display the maximum available space on the disk to store the configuration database
Current database size on disk	Display the total space on the disk used by the current configuration database
Actual database usage	Display the actual space on the disk used by the current configuration data

Table 15: show system configuration database usage Output Fields (*continued*)

Field Name	Field Description
Available database space	Display the free space available on the disk to store the configuration database

Sample Output

show system configuration database usage

user@host> **show system configuration database usage**

```
Maximum size of the database: 665.99 MB
Current database size on disk: 1.50 MB
Actual database usage: 1.48 MB
Available database space: 664.51 MB
```

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 330](#)

[Syntax \(EX Series Switches and MX Series Routers\) on page 330](#)

[Syntax \(QFX Series Switches\) on page 330](#)

[Syntax \(OCX Series\) on page 331](#)

[Syntax \(TX Matrix Routers\) on page 331](#)

[Syntax \(TX Matrix Plus Router\) on page 331](#)

[Syntax \(Junos OS Evolved\) on page 331](#)

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 and 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 (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 (OCX Series)

```
show system processes
<brief | detail | extensive | summary >
<health (pid process-identifier | process-name process-name)>
host-processes (brief|detail )
<providers>
<resource-limits>
<wide>
```

Syntax (TX Matrix Routers)

```
show system processes
<brief | detail | extensive | summary>
<all-chassis| all-lcc | lcc number | scc>
<wide>
```

Syntax (TX Matrix Plus Router)

```
show system processes
<brief | detail | extensive | summary>
<all-chassis| all-lcc | lcc number | sfc number>
<wide>
```

Syntax (Junos OS Evolved)

```
show system processes
<brief | detail | extensive | summary>
<node node-name>
<wide>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

Option **sfc** introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

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.

mountd-service—(EX Series switches and MX Series routers only) (Optional) Display the service for NFS mounts requests.

mpls-traceroute—(Optional) Display the MPLS Periodic Traceroute process.

mspd—(Optional) Display the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Display the multicast snooping process, which makes Layer 2 devices such as VLAN switches aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Display the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

neighbor-liveness—Display the process, which specifies the maximum length of time that the router waits for its neighbor to re-establish an LDP session.

nfsd-service—(Optional) Display the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

ntp—Display the Network Time Protocol (NTP) process, which provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network.

packet-triggered-subscribers—Display the packet-triggered 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.

node *node-name*—Specify a name if you want to view the system process details for that node. Example: **re0**.

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

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Output Fields

The following table describes the output fields for the **show system processes** command. Output fields are listed in the approximate order in which they appear.

Table 16: 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

Table 16: show system processes Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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

Table 16: show system processes Output Fields (*continued*)

Field Name	Field Description	Level of Output
Swap	Information about physical and virtual memory allocation. NOTE: Memory can remain swapped out indefinitely if it is not accessed again. Therefore, the show system process extensive command shows that memory is swapped to disk even though there is plenty of free memory, and such a situation is not unusual.	brief extensive summary
PID	Process identifier.	detail extensive summary
TT	Control terminal name.	none detail
STAT	Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process: <ul style="list-style-type: none"> • D—In disk or other short-term, uninterruptible wait • I—Idle (sleeping longer than about 20 seconds) • R—Runnable • S—Sleeping for less than 20 seconds • T—Stopped • Z—Dead (zombie) • + —The process is in the foreground process group of its control terminal. • <—The process has raised CPU scheduling priority. • >—The process has specified a soft limit on memory requirements and is currently exceeding that limit; such a process is not swapped. • A—The process requested random page replacement. • E—The process is trying to exit. • L—The process has pages locked in core. • N—The process has reduced CPU scheduling priority. • S—The process requested first-in, first-out (FIFO) page replacement. • s—The process is a session leader. • V—The process is temporarily suspended. • W—The process is swapped out. • X—The process is being traced or debugged. 	none detail
UID	User identifier.	detail
USERNAME	Process owner.	extensive summary

Table 16: show system processes Output Fields (*continued*)

Field Name	Field Description	Level of Output
PPID	Parent process identifier.	detail
CPU	(D)—Short-term CPU usage. (E and S)—Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.	detail extensive summary
RSS	Resident set size.	detail
WCHAN	Symbolic name of the wait channel.	detail
STARTED	Local time when the process started running.	detail
PRI	Current priority of the process. A lower number indicates a higher priority.	detail extensive summary
NI or NICE	UNIX "niceness" value. A lower number indicates a higher priority.	detail extensive summary
SIZE	Total size of the process (text, data, and stack), in kilobytes.	extensive summary
RES	Current amount of program resident memory, in kilobytes. This is also known as RSS or Resident Set Size. The RES value includes shared library pages used by the process. Any amount of memory freed by the process might still be considered part of the RES value. Generally, the kernel delays the migrating of memory out of the Inact queue into the Cache or Free list unless there is a memory shortage. This can lead to large discrepancies between the values reported by the routing protocol process and the kernel, even after the routing protocol process has freed a large amount of memory.	extensive summary
STATE	Current state of the process (for example, sleep , wait , run , idle , zombie , or stop).	extensive summary
C	CPU number. NOTE: There is no such column in output from Junos OS Evolved. To see the CPU number, issue the show system processes wide detail command and look at the PSR column.	extensive summary

Table 16: show system processes Output Fields (*continued*)

Field Name	Field Description	Level of Output
TIME	(S)—Number of system and user CPU seconds that the process has used. (None, D, and E)—Total amount of time that the command has been running.	detail extensive summary
WCPU	Weighted CPU usage.	extensive summary
COMMAND	Command that is currently running. (MX Series routers only) When you display the software processes for an MX Series Virtual Chassis, the show system processes command does not display information about the relayd process.	detail extensive summary
THR	Number of threads in the process	extensive

Sample Output

show system processes

```
user@host> show system processes
```

```

PID  TT  STAT      TIME COMMAND
   0  ??  DLs      0:00.70  (swapper)
   1  ??  Is       0:00.35  /sbin/init --
   2  ??  DL       0:00.00  (pagedaemon)
   3  ??  DL       0:00.00  (vmdaemon)
   4  ??  DL      0:42.37  (update)
   5  ??  DL       0:00.00  (if_jnx)
  80  ??  Ss       0:14.66  syslogd -s
  96  ??  Is       0:00.01  portmap
128  ??  Is       0:02.70  cron
173  ??  Is       0:02.24  /usr/local/sbin/sshd (sshd1)
189  ??  S        0:03.80  /sbin/watchdog -t180
190  ??  I        0:00.03  /usr/sbin/tnetd -N
191  ??  S        2:24.76  /sbin/ibd -N
192  ??  S<       0:55.44  /usr/sbin/xntpd -N
195  ??  S        0:53.11  /usr/sbin/snmpd -N
196  ??  S        1:15.73  /usr/sbin/mib2d -N
198  ??  I        0:00.75  /usr/sbin/inetd -N
2677 ??  I        0:00.01  /usr/sbin/mgd -N

```

```

2712  ??  Ss      0:00.24 rlogind
2735  ??  R       0:00.00 /bin/ps -ax
1985  p0- S      0:07.41 ./rpd -N
2713  p0  Is      0:00.24 -tcsh (tcsh)
2726  p0  S+      0:00.07 cli

```

show system processes brief

user@host> show system processes brief

```

last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

```

show system processes detail

user@host> show system processes detail

PID	UID	PPID	CPU	PRI	NI	RSS	WCHAN	STARTED	TT	STAT	TIME	COMMAND
3151	1049	3129	2	28	0	672	-	1:13PM	p0	R+	0:00.00	ps -ax -r
1	0	0	0	10	0	376	wait	1:51PM	??	Is	0:00.29	/sbin/ini
2	0	0	0	-18	0	12	psleep	1:51PM	??	DL	0:00.00	(pagedae
3	0	0	0	28	0	12	psleep	1:51PM	??	DL	0:00.00	(vmdaemo
4	0	0	0	28	0	12	update	1:51PM	??	DL	0:07.15	(update)
5	0	0	0	2	0	12	pfesel	1:51PM	??	IL	0:02.90	(if_pfe)
27	0	1	0	10	0	17936	mfsidl	1:51PM	??	Is	0:00.46	mfs /dev/
81	0	1	0	2	0	496	select	1:52PM	??	Ss	0:31.21	syslogd -
119	1	1	0	2	0	492	select	1:52PM	??	Is	0:00.00	portmap
134	0	1	0	2	0	580	select	1:52PM	??	S	0:02.95	amd -p -a
151	0	1	0	18	0	532	pause	1:52PM	??	Is	0:00.34	cron
183	0	1	0	2	0	420	select	1:52PM	??	Ss	0:00.07	/usr/loca
206	0	1	0	18	0	72	pause	1:52PM	??	S	0:00.51	/sbin/wat
207	0	1	0	2	0	520	select	1:52PM	??	I	0:00.16	/usr/sbin
208	0	1	0	2	0	536	select	1:52PM	??	S	0:08.21	/sbin/dcd
210	0	1	255	2	-12	740	select	1:52PM	??	S<	0:05.83	/usr/sbin
211	0	1	0	2	0	376	select	1:52PM	??	S	0:00.03	/usr/sbin
215	0	1	0	2	0	548	select	1:52PM	??	I	0:00.50	/usr/sbin
219	0	1	0	3	0	540	ttyin	1:52PM	v0	Is+	0:00.02	/usr/libe
220	0	1	0	3	0	540	ttyin	1:52PM	v1	Is+	0:00.01	/usr/libe
221	0	1	0	3	0	540	ttyin	1:52PM	v2	Is+	0:00.01	/usr/libe
222	0	1	0	3	0	540	ttyin	1:52PM	v3	Is+	0:00.01	/usr/libe

```

735      0      1      0      2      0 468 select  2:47PM  ??  S      0:19.14 /usr/sbin
736      0      1      0      2      0 212 select  2:47PM  ??  S      0:14.13 /usr/sbin
1380     0      1      0      3      0 888 ttyin   7:32PM   d0  Is+    0:00.46 bash
3019     0    207      0      2      0 636 select 10:49AM  ??  Ss     0:02.93 tnp.chass
3122     0    1380      0      2      0 1764 select 12:33PM  d0  S      0:00.77 ./rpd -N
3128     0    215      0      2      0 580 select 12:45PM  ??  Ss     0:00.12 rlogind
3129    1049    3128      0     18      0 944 pause  12:45PM  p0  Ss     0:00.14 -tcsh (tc
      0      0      0      0    -18      0      0 sched   1:51PM  ??  DLs    0:00.10 (swapper

```

show system processes extensive

user@host> show system processes extensive

```

Mem: 241M Active, 99M Inact, 78M Wired, 325M Cache, 69M Buf, 1251M Free
Swap: 2048M Total, 2048M Free

```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	COMMAND
11	root	1	171	52	0K	12K	RUN	807.5H	98.73%	idle
13	root	1	-20	-139	0K	12K	WAIT	36:17	0.00%	swi7: clock sio
1499	root	1	96	0	7212K	3040K	select	34:01	0.00%	license-check
1621	root	1	96	0	20968K	11216K	select	20:25	0.00%	mib2d
1465	root	2	8	-88	115M	11748K	nanslp	14:32	0.00%	chassisd
1478	root	1	96	0	6336K	3816K	select	11:28	0.00%	ppmd
20	root	1	-68	-187	0K	12K	WAIT	10:28	0.00%	irq10: em0 eml+++*
1490	root	1	96	0	11792K	4336K	select	9:44	0.00%	shm-rtssdbd
1618	root	1	96	0	39584K	7464K	select	8:47	0.00%	pfed
1622	root	1	96	0	15268K	10988K	select	6:16	0.00%	snmpd
1466	root	1	96	0	7408K	2896K	select	5:44	0.00%	alarmd
7	root	1	-16	0	0K	12K	client	5:09	0.00%	ifstate notify
1480	root	1	96	0	5388K	2660K	select	4:29	0.00%	ksyncd
12	root	1	-40	-159	0K	12K	WAIT	4:15	0.00%	swi2: netisr 0
1462	root	1	96	0	1836K	1240K	select	3:57	0.00%	bslockd
55	root	1	-16	0	0K	12K	-	3:44	0.00%	schedcpu
1392	root	1	16	0	0K	12K	bcmsem	3:37	0.00%	bcmLINK.0
47	root	1	-16	0	0K	12K	psleep	3:25	0.00%	vmkmemdaemon
36	root	1	20	0	0K	12K	syncer	2:46	0.00%	syncer
1484	root	1	96	0	7484K	3428K	select	2:38	0.00%	clksyncd
1616	root	1	96	0	4848K	2848K	select	2:18	0.00%	irsd
1487	root	1	96	0	32800K	6992K	select	2:10	0.00%	smid
1623	root	1	96	0	34616K	5464K	select	2:01	0.00%	dcd
15	root	1	-16	0	0K	12K	-	1:59	0.00%	yarrow
49	root	1	-16	0	0K	12K	.	1:51	0.00%	ddostasks

show system processes extensive (CPU No. in Output)

```
user@host> show system processes extensive
```

```
last pid: 54704; load averages: 0.16, 0.19, 0.17 up 7+11:02:55 21:12:44
129 processes: 2 running, 126 sleeping, 1 waiting
```

```
Mem: 83M Active, 1616M Inact, 1768M Wired, 1936M Buf, 12G Free
```

```
Swap: 8192M Total, 8192M Free
```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	C	TIME	WCPU	COMMAND
10	root	4	155	ki31	0K	64K	CPU3	3	706.9H	400.00%	idle
18429	root	2	-26	r26	892M	30280K	nanslp	2	321:50	2.29%	chassisd
18435	root	1	20	0	794M	49116K	select	0	9:42	0.20%	mib2d
11	root	25	-60	-	0K	400K	WAIT	0	79:53	0.00%	intr
0	root	22	-100	0	0K	352K	-	2	22:42	0.00%	kernel
13	root	1	-16	-	0K	16K	-	1	19:06	0.00%	rand_harvestq

show system processes extensive (EX9200 Switch)

```
user@switch> show system processes extensive
```

```
last pid: 3372; load averages: 0.02, 0.02, 0.00 up 0+01:42:22 16:39:57
151 processes: 4 running, 131 sleeping, 1 zombie, 15 waiting
```

```
Mem: 935M Active, 122M Inact, 108M Wired, 838M Cache, 214M Buf, 5872M Free
```

```
Swap: 8192M Total, 8192M Free
```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	COMMAND
10	root	1	171	52	0K	16K	RUN	96:34	92.19%	idle
3317	root	1	97	0	40412K	30944K	select	0:00	5.13%	mgd
3316	root	1	96	0	26672K	20516K	select	0:00	3.08%	cli
1626	root	2	8	-88	124M	20332K	nanslp	3:19	2.39%	chassisd
260	root	1	-8	0	0K	16K	mdwait	0:16	0.00%	md16
19	root	1	-68	-187	0K	16K	WAIT	0:12	0.00%	irq11: em0 em1 em2*
1642	root	1	96	0	8052K	3936K	RUN	0:10	0.00%	clksyncd
11	root	1	-20	-139	0K	16K	WAIT	0:07	0.00%	swi7: clock sio
154	root	1	-8	0	0K	16K	mdwait	0:06	0.00%	md8
1784	root	1	96	0	98M	33720K	select	0:05	0.00%	authd
1646	root	1	96	0	7776K	2944K	select	0:03	0.00%	license-check
1807	root	1	96	0	41340K	9944K	select	0:02	0.00%	mib2d

```
[...Output truncated...]
```

show system processes extensive (Junos OS Evolved)

```
user@host> show system processes extensive
```

```
node: re0
-----
top - 21:10:05 up 6:25, 2 users, load average: 0.94, 0.88, 0.83
Tasks: 495 total, 2 running, 490 sleeping, 0 stopped, 3 zombie
%Cpu(s): 2.3 us, 1.0 sy, 0.0 ni, 96.3 id, 0.2 wa, 0.1 hi, 0.0 si, 0.0 st
KiB Mem : 65279104 total, 48374440 free, 13348056 used, 3556608 buff/cache
KiB Swap: 4194300 total, 4194300 free, 0 used. 51026672 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR S  %CPU  %MEM     TIME+ COMMAND
 8605 root        20   0 7244592 1.017g 9456 S  77.8   1.6   59:41.47 evo-cda-zx
24072 root        20   0 8838920 1.784g 52108 S  27.8   2.9   18:11.92 EvoAftMan-+
10207 root        20   0 6626916 125304 16224 R  16.7   0.2   30:56.38 fabspoked-+
21495 root        20   0  20128   1040   212 R  16.7   0.0    0:00.06 top
 7675 root        20   0 13.729g 46564 34348 S   5.6   0.1    5:08.90 trace-relay
```

There is no CPU column in output running Junos OS Evolved.

show system processes extensive detail (Junos OS Evolved)

```
user@host> show system processes extensive detail
```

```
node: re0
-----
F S UID          PID  PPID  PGID   SID  C PRI  NI ADDR SZ WCHAN    RSS  PSR  STIME  TTY
TIME CMD
 4 S root          1    0    1    1  0  80   0 - 44812 ep_pol 4232   1 14:44 ?
00:00:06 /sbin/init --dump-core
 1 S root          2    0    0    0  0  80   0 -    0 kthrea    0   9 14:44 ?
00:00:00 [kthreadd]
 1 S root          3    2    0    0  0  80   0 -    0 smpboo    0   0 14:44 ?
00:00:00 [ksoftirqd/0]
 1 S root          5    2    0    0  0  60 -20 -    0 worker    0   0 14:44 ?
00:00:00 [kworker/0:0H]
```

The **PSR** column gives the CPU number.

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	dcpcfe
9230	root	20	0	15208	1092	832	R	2	0.0	0:00.01	top
1	root	20	0	4216	660	576	S	0	0.0	2:09.61	init
2	root	20	0	0	0	0	S	0	0.0	0:00.00	kthreadd
3	root	20	0	0	0	0	S	0	0.0	0:00.21	ksoftirqd/0
4	root	20	0	0	0	0	S	0	0.0	0:00.00	kworker/0:0
5	root	0	-20	0	0	0	S	0	0.0	0:00.00	kworker/0:0H
7	root	RT	0	0	0	0	S	0	0.0	0:00.52	migration/0
8	root	20	0	0	0	0	S	0	0.0	0:04.36	rcu_preempt
9	root	20	0	0	0	0	S	0	0.0	0:00.00	rcu_bh
10	root	20	0	0	0	0	S	0	0.0	0:00.00	rcu_sched
11	root	RT	0	0	0	0	S	0	0.0	0:00.53	migration/1

[...Output truncated...]

show system processes lcc wide (TX Matrix Routing Matrix)

user@host> show system processes lcc 2 wide

lcc2-re0:

```
-----
PID TT STAT TIME COMMAND
0 ?? DLs 0:00.00 (swapper)
1 ?? ILs 0:00.10 /sbin/preinit -- (init)
2 ?? DL 0:00.00 (pagedaemon)
3 ?? DL 0:00.00 (vmddaemon)
4 ?? DL 0:00.00 (bufddaemon)
5 ?? DL 0:00.04 (syncer)
6 ?? DL 0:00.00 (netddaemon)
7 ?? IL 0:00.00 (if_pic_listen)
8 ?? IL 0:00.00 (scs_housekeeping)
9 ?? IL 0:00.00 (if_pfe_listen)
10 ?? DL 0:00.00 (vmuncachedaemon)
```

```

 11  ??  SL      0:00.02  (cb_poll)
172  ??  ILs     0:00.21  mfs -o noauto /dev/ad1s1b /tmp (newfs)
2909 ??  Is      0:00.00  pccardd
2932 ??  Ss      0:00.07  syslogd -r -s
3039 ??  Is      0:00.00  cron
3217 ??  I       0:00.00  /sbin/watchdog -d
3218 ??  I       0:00.02  /usr/sbin/tnetd -N
3221 ??  S       0:00.11  /usr/sbin/alarmd -N
3222 ??  S       0:00.85  /usr/sbin/craftd -N
3223 ??  S       0:00.05  /usr/sbin/mgd -N
3224 ??  I       0:00.02  /usr/sbin/inetd -N
3225 ??  I       0:00.00  /usr/sbin/tnp.sntpd -N
3226 ??  I       0:00.01  /usr/sbin/tnp.sntpc -N
3228 ??  I       0:00.01  /usr/sbin/smartd -N
3231 ??  I       0:00.01  /usr/sbin/eccd -N
3425 ??  S       0:00.09  /usr/sbin/dfwd -N
3426 ??  S       0:00.19  /sbin/dcd -N
3427 ??  I       0:00.04  /usr/sbin/pfed -N
3430 ??  S       0:00.10  /usr/sbin/ksyncd -N
3482 ??  S       1:53.63  /usr/sbin/chassisd -N
4285 ??  SL      0:00.01  (peer proxy)
4286 ??  SL      0:00.00  (peer proxy)
4303 ??  Ss      0:00.00  mgd: (mgd) (root) (mgd)
4304 ??  R       0:00.00  /bin/ps -ax -ww
3270 d0  Is+    0:00.00  /usr/libexec/getty std.9600 ttyd0

```

show system processes summary

user@host> show system processes summary

```

last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

```

PID	USERNAME	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	CPU	COMMAND
527	root	2	0	176K	580K	select	0:00	0.04%	0.04%	rlogind
543	root	30	0	604K	768K	RUN	0:00	0.00%	0.00%	top

show system processes (TX Matrix Plus Router)

user@host> show system processes

sfc0-re0:

```

-----
PID  TT  STAT      TIME COMMAND
  0  ??  WLS      0:00.00 [swapper]
  1  ??  ILs      0:00.18 /packages/mnt/jbase/sbin/init --
  2  ??  DL       0:00.20 [g_event]
  3  ??  DL       0:00.39 [g_up]
  4  ??  DL       0:00.32 [g_down]
  5  ??  DL       0:00.00 [thread taskq]
  6  ??  DL       0:00.09 [kqueue taskq]
  7  ??  DL       0:00.01 [pagedaemon]
  8  ??  DL       0:00.00 [vmdaemon]
  9  ??  DL       0:06.63 [pagezero]
 10  ??  DL       0:00.00 [ktrace]
 11  ??  RL      310:52.98 [idle]
 12  ??  WL       0:11.03 [swi2: net]
 13  ??  WL       0:27.58 [swi7: clock sio]
 14  ??  WL       0:00.00 [swi6: vm]
 15  ??  DL       0:03.02 [yarrow]
 16  ??  WL       0:00.00 [swi9: +]
 17  ??  WL       0:00.00 [swi8: +]
 18  ??  WL       0:00.00 [swi5: cambio]
 19  ??  WL       0:00.00 [swi9: task queue]
 20  ??  WL       0:11.41 [irq16: uhci0 uhci*]
 21  ??  DL       0:00.00 [usb0]
 22  ??  DL       0:00.00 [usbtask]
 23  ??  WL       0:39.51 [irq17: uhci1 uhci*]
 24  ??  DL       0:00.00 [usb1]
 25  ??  WL       0:00.00 [irq18: uhci2 uhci*]
 26  ??  DL       0:00.83 [usb2]
 27  ??  DL       0:00.00 [usb3]
 28  ??  DL       0:00.00 [usb4]
 29  ??  DL       0:00.00 [usb5]
 30  ??  DL       0:00.73 [usb6]
 31  ??  DL       0:00.00 [usb7]
 32  ??  WL       0:00.00 [irq14: ata0]
 33  ??  WL       0:00.00 [irq15: ata1]
 34  ??  WL       0:00.00 [irq1: atkbd0]
 35  ??  WL       0:00.00 [swi0: sio]
 36  ??  WL       0:00.00 [irq11: isab0]
 37  ??  WL       0:00.00 [swi3: ip6opt ipopt]
 38  ??  WL       0:00.00 [swi4: ip6mismatch+]
 39  ??  WL       0:00.00 [swi1: ipfwd]
 40  ??  DL       0:00.02 [bufdaemon]

```



```

41 ?? DL      0:00.02 [vnlru]
42 ?? DL      0:00.39 [syncer]
43 ?? DL      0:00.05 [softdepflush]
44 ?? DL      0:00.00 [netdaemon]
45 ?? DL      0:00.02 [vmuncachedaemon]
46 ?? DL      0:00.00 [if_pic_listen]
47 ?? DL      0:00.35 [vmkmemdaemon]
48 ?? DL      0:00.00 [cb_poll]
49 ?? DL      0:00.06 [if_pfe_listen]
50 ?? DL      0:00.00 [scs_housekeeping]
51 ?? IL      0:00.00 [kern_dump_proc]
52 ?? IL      0:00.00 [nfsiod 0]
53 ?? IL      0:00.00 [nfsiod 1]
54 ?? IL      0:00.00 [nfsiod 2]
55 ?? IL      0:00.00 [nfsiod 3]
56 ?? DL      0:00.37 [schedcpu]
57 ?? DL      0:00.56 [md0]
79 ?? DL      0:02.58 [md1]
100 ?? DL     0:00.03 [md2]
118 ?? DL     0:00.01 [md3]
139 ?? DL     0:00.95 [md4]
160 ?? DL     0:00.12 [md5]
181 ?? DL     0:00.00 [md6]
217 ?? DL     0:00.02 [md7]
227 ?? DL     0:00.05 [md8]
1341 ?? SL    0:01.34 [bcmTX]
1342 ?? SL    0:01.68 [bcmXGS3AsyncTX]
1343 ?? SL    0:41.40 [bcmLINK.0]
1345 ?? SL    0:33.83 [bcmLINK.1]
1350 ?? Is    0:00.01 /usr/sbin/cron
1502 ?? S     0:00.01 /sbin/watchdog -t-1
1503 ?? S     0:00.86 /usr/libexec/bslockd -mp -N
1504 ?? S     0:00.01 /usr/sbin/tnetd -N
1507 ?? S     0:01.32 /usr/sbin/alarmd -N
1508 ?? S     0:14.54 /usr/sbin/craftd -N
1509 ?? S     0:01.19 /usr/sbin/mgd -N
1512 ?? I     0:00.05 /usr/sbin/inetd -N
1513 ?? S     0:00.10 /usr/sbin/tnp.sntpd -N
1517 ?? S     0:00.11 /usr/sbin/smartd -N
1525 ?? S     0:01.10 /usr/sbin/idpd -N
1526 ?? S     0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
1527 ?? I     0:00.01 /usr/libexec/getty Pc ttyv0
1616 ?? DL    0:00.30 [peer proxy]
1617 ?? DL    0:00.32 [peer proxy]

```

```

1618 ?? DL      0:00.34 [peer proxy]
1619 ?? DL      0:00.30 [peer proxy]
2391 ?? Is      0:00.01 telnetd
7331 ?? Ss      0:00.03 telnetd
9538 ?? DL      0:01.16 [jsr_kkcm]
9613 ?? DL      0:00.18 [peer proxy]
23781 ?? Ss     0:00.01 telnetd
23926 ?? Ss     0:00.01 mgd: (mgd) (user)/dev/ttyp2 (mgd)
36867 ?? S      0:03.14 /usr/sbin/rpd -N
36874 ?? S      0:00.08 /usr/sbin/lmpd
36876 ?? S      0:00.17 /usr/sbin/lacpd -N
36877 ?? S      0:00.15 /usr/sbin/bfdd -N
36878 ?? S      0:05.05 /usr/sbin/ppmd -N
36907 ?? S      0:25.07 /usr/sbin/chassisd -N
37775 ?? S      0:00.01 /usr/sbin/bdbrepd -N
45727 ?? S      0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729 ?? S      0:00.38 /usr/sbin/l2ald -N
45730 ?? S<     0:00.12 /usr/sbin/apsd -N
45731 ?? SN     0:00.10 /usr/sbin/sampled -N
45732 ?? S      0:00.03 /usr/sbin/ilmid -N
45733 ?? S      0:00.09 /usr/sbin/rmopd -N
45734 ?? S      0:00.30 /usr/sbin/cosd
45735 ?? I      0:00.00 /usr/sbin/rtspd -N
45736 ?? S      0:00.06 /usr/sbin/fsad -N
45737 ?? S      0:00.05 /usr/sbin/rdd -N
45738 ?? S      0:00.10 /usr/sbin/pppd -N
45739 ?? S      0:00.05 /usr/sbin/dfcd -N
45740 ?? S      0:00.07 /usr/sbin/lfmd -N
45741 ?? S      0:00.01 /usr/sbin/mplsoamd -N
45742 ?? I      0:00.01 /usr/sbin/sendd -N
45743 ?? S      0:00.08 /usr/sbin/appidd -N
45744 ?? S      0:00.05 /usr/sbin/mspd -N
45745 ?? S      0:00.25 /usr/sbin/jdiameterd -N
45746 ?? S      0:00.10 /usr/sbin/pfed -N
45747 ?? S      0:00.19 /usr/sbin/lpdfd -N
45748 ?? S      0:00.63 /sbin/dcd -N
45750 ?? S      0:00.45 /usr/sbin/mib2d -N
45751 ?? S      0:00.15 /usr/sbin/dfwd -N
45752 ?? S      0:00.15 /usr/sbin/irsd -N
45764 ?? S      0:20.59 /usr/sbin/snmpd -N
56479 ?? Ss     0:00.00 mgd: (mgd) (root) (mgd)
56480 ?? R      0:00.00 /bin/ps -ax
1142 d0- I      0:00.01 /usr/sbin/usbd -N
1160 d0- S      0:29.17 /usr/sbin/eventd -N -r -s -A

```

```

6527 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0
2392 p1 Is 0:00.00 login [pam] (login)
2393 p1 I 0:00.00 -csh (csh)
2394 p1 I 0:00.00 su -
2395 p1 I+ 0:00.01 -su (csh)
23782 p2 Is 0:00.00 login [pam] (login)
23881 p2 I 0:00.00 -csh (csh)
23925 p2 S+ 0:00.03 cli
7332 p3 Is 0:00.00 login [pam] (login)
7333 p3 I 0:00.00 -csh (csh)
23780 p3 S+ 0:00.02 telnet aj

```

lcc0-re0:

PID	TT	STAT	TIME	COMMAND
0	??	WLs	0:00.00	[swapper]
1	??	ILs	0:00.16	/packages/mnt/jbase/sbin/init --
2	??	DL	0:00.01	[g_event]
3	??	DL	0:00.16	[g_up]
4	??	DL	0:00.11	[g_down]
5	??	DL	0:00.00	[thread taskq]
6	??	DL	0:00.00	[kqueue taskq]
7	??	DL	0:00.00	[pagedaemon]
8	??	DL	0:00.00	[vmdaemon]
9	??	DL	0:01.77	[pagezero]
10	??	DL	0:00.00	[ktrace]
11	??	RL	17:22.31	[idle]
12	??	WL	0:00.32	[swi2: net]
13	??	WL	0:01.21	[swi7: clock sio]
14	??	WL	0:00.00	[swi6: vm]
15	??	DL	0:00.10	[yarrow]
16	??	WL	0:00.00	[swi9: +]
17	??	WL	0:00.00	[swi8: +]
18	??	WL	0:00.00	[swi5: cambio]
19	??	WL	0:00.00	[swi9: task queue]
20	??	WL	0:02.73	[irq10: bcm0 uhci1*]
21	??	WL	0:00.02	[irq11: cb0 uhci0+*]
22	??	DL	0:00.00	[usb0]
23	??	DL	0:00.00	[usbtask]
24	??	DL	0:00.00	[usb1]
25	??	DL	0:00.05	[usb2]
26	??	DL	0:00.00	[usb3]
27	??	DL	0:00.00	[usb4]
28	??	DL	0:00.00	[usb5]

```

29 ?? DL      0:00.04 [usb6]
30 ?? DL      0:00.00 [usb7]
31 ?? WL      0:00.00 [irq14: ata0]
32 ?? WL      0:00.00 [irq15: ata1]
33 ?? WL      0:00.00 [irq1: atkbd0]
34 ?? WL      0:00.00 [swi0: sio]
35 ?? WL      0:00.00 [swi3: ip6opt ipopt]
36 ?? WL      0:00.00 [swi4: ip6mismatch+]
37 ?? WL      0:00.00 [swi1: ipfwd]
38 ?? DL      0:00.00 [bufdaemon]
39 ?? DL      0:00.00 [vnlru]
40 ?? DL      0:00.01 [syncer]
41 ?? DL      0:00.00 [softdepflush]
42 ?? DL      0:00.00 [netdaemon]
43 ?? DL      0:00.00 [vmuncachedaemon]
44 ?? DL      0:00.00 [if_pic_listen]
45 ?? DL      0:00.02 [vmkmemdaemon]
46 ?? DL      0:00.01 [cb_poll]
47 ?? DL      0:00.00 [if_pfe_listen]
48 ?? DL      0:00.00 [scs_housekeeping]
49 ?? IL      0:00.00 [kern_dump_proc]
50 ?? IL      0:00.00 [nfsiod 0]
51 ?? IL      0:00.00 [nfsiod 1]
52 ?? IL      0:00.00 [nfsiod 2]
53 ?? IL      0:00.00 [nfsiod 3]
54 ?? DL      0:00.01 [schedcpu]
55 ?? DL      0:00.73 [md0]
77 ?? DL      0:03.54 [md1]
98 ?? DL      0:00.37 [md2]
116 ?? DL     0:00.02 [md3]
137 ?? DL     0:00.56 [md4]
158 ?? DL     0:00.15 [md5]
179 ?? DL     0:00.00 [md6]
215 ?? DL     0:00.03 [md7]
225 ?? DL     0:00.03 [md8]
1078 ?? DL    0:00.00 [jsr_kkcm]
1363 ?? SL    0:00.09 [bcmTX]
1364 ?? SL    0:00.10 [bcmXGS3AsyncTX]
1365 ?? SL    0:03.08 [bcmLINK.0]
1370 ?? Is    0:00.00 /usr/sbin/cron
1522 ?? S     0:00.00 /sbin/watchdog -t-1
1523 ?? S     0:00.05 /usr/libexec/bslockd -mp -N
1524 ?? I     0:00.01 /usr/sbin/tnetd -N
1526 ?? S     0:04.98 /usr/sbin/chassisd -N

```

```

1527 ?? S      0:00.04 /usr/sbin/alarmd -N
1528 ?? I      0:00.40 /usr/sbin/craftd -N
1529 ?? S      0:00.08 /usr/sbin/mgd -N
1532 ?? I      0:00.04 /usr/sbin/inetd -N
1533 ?? I      0:00.00 /usr/sbin/tnp.sntpd -N
1534 ?? I      0:00.00 /usr/sbin/tnp.sntpc -N
1536 ?? S      0:00.01 /usr/sbin/smartd -N
1540 ?? I      0:00.07 /usr/sbin/jcsd -N
1541 ?? S      0:00.11 /usr/sbin/idpd -N
1542 ?? I      0:00.00 /usr/libexec/getty Pc ttyv0
2089 ?? DL     0:00.01 [peer proxy]
2090 ?? DL     0:00.01 [peer proxy]
2091 ?? DL     0:00.01 [peer proxy]
2657 ?? S      0:00.02 /usr/sbin/dfwd -N
2658 ?? S      0:00.02 /sbin/dcd -N
2659 ?? S      0:00.05 /usr/sbin/snmpd -N
2660 ?? S      0:00.01 /usr/sbin/mib2d -N
2661 ?? S      0:00.01 /usr/sbin/pfed -N
2662 ?? S      0:00.01 /usr/sbin/irsd -N
2667 ?? S      0:00.13 /usr/sbin/ksyncd -N
2690 ?? Ss     0:00.00 mgd: (mgd) (root) (mgd)
2691 ?? R      0:00.00 /bin/ps -ax
1164 d0- S      0:00.00 /usr/sbin/usbd -N
1182 d0- S      0:00.34 /usr/sbin/eventd -N -r -s -A
1543 d0 Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0

```

lcc1-re0:

```

-----
PID  TT  STAT      TIME COMMAND
  0  ??  Wls      0:00.00 [swapper]
  1  ??  ILs      0:00.17 /packages/mnt/jbase/sbin/init --
  2  ??  DL       0:00.01 [g_event]
  3  ??  DL       0:00.16 [g_up]
  4  ??  DL       0:00.11 [g_down]
  5  ??  DL       0:00.00 [thread taskq]
  6  ??  DL       0:00.00 [kqueue taskq]
  7  ??  DL       0:00.00 [pagedaemon]
  8  ??  DL       0:00.00 [vmdaemon]
  9  ??  DL       0:01.77 [pagezero]
 10  ??  DL       0:00.00 [ktrace]
 11  ??  RL      17:22.83 [idle]
 12  ??  WL       0:00.35 [swi2: net]
 13  ??  WL       0:01.20 [swi7: clock sio]
 14  ??  WL       0:00.00 [swi6: vm]

```

```

15 ?? DL      0:00.10 [yarrow]
16 ?? WL      0:00.00 [swi9: +]
17 ?? WL      0:00.00 [swi8: +]
18 ?? WL      0:00.00 [swi5: cambio]
19 ?? WL      0:00.00 [swi9: task queue]
20 ?? WL      0:02.87 [irq10: bcm0 uhci1*]
21 ?? WL      0:00.02 [irq11: cb0 uhci0+*]
22 ?? DL      0:00.00 [usb0]
23 ?? DL      0:00.00 [usbtask]
24 ?? DL      0:00.00 [usb1]
25 ?? DL      0:00.05 [usb2]
26 ?? DL      0:00.00 [usb3]
27 ?? DL      0:00.00 [usb4]
28 ?? DL      0:00.00 [usb5]
29 ?? DL      0:00.04 [usb6]
30 ?? DL      0:00.00 [usb7]
31 ?? WL      0:00.00 [irq14: ata0]
32 ?? WL      0:00.00 [irq15: ata1]
33 ?? WL      0:00.00 [irq1: atkbd0]
34 ?? WL      0:00.00 [swi0: sio]
35 ?? WL      0:00.00 [swi3: ip6opt ipopt]
36 ?? WL      0:00.00 [swi4: ip6mismatch+]
37 ?? WL      0:00.00 [swi1: ipfwd]
38 ?? DL      0:00.00 [bufdaemon]
39 ?? DL      0:00.00 [vnlru]
40 ?? DL      0:00.01 [syncer]
41 ?? DL      0:00.00 [softdepflush]
42 ?? DL      0:00.00 [netdaemon]
43 ?? DL      0:00.00 [vmuncachedaemon]
44 ?? DL      0:00.00 [if_pic_listen]
45 ?? DL      0:00.02 [vmkmemdaemon]
46 ?? DL      0:00.01 [cb_poll]
47 ?? DL      0:00.00 [if_pfe_listen]
48 ?? DL      0:00.00 [scs_housekeeping]
49 ?? IL      0:00.00 [kern_dump_proc]
50 ?? IL      0:00.00 [nfsiod 0]
51 ?? IL      0:00.00 [nfsiod 1]
52 ?? IL      0:00.00 [nfsiod 2]
53 ?? IL      0:00.00 [nfsiod 3]
54 ?? DL      0:00.02 [schedcpu]
55 ?? DL      0:00.75 [md0]
77 ?? DL      0:03.40 [md1]
98 ?? DL      0:00.37 [md2]
116 ?? DL     0:00.02 [md3]

```

```

137  ??  DL      0:00.56 [md4]
158  ??  DL      0:00.15 [md5]
179  ??  DL      0:00.00 [md6]
215  ??  DL      0:00.03 [md7]
225  ??  DL      0:00.03 [md8]
1052 ??  DL      0:00.00 [jsr_kkcm]
1337 ??  SL      0:00.09 [bcmTX]
1338 ??  SL      0:00.10 [bcmXGS3AsyncTX]
1339 ??  SL      0:03.10 [bcmLINK.0]
1344 ??  Is      0:00.00 /usr/sbin/cron
1496 ??  S       0:00.00 /sbin/watchdog -t-1
1497 ??  S       0:00.05 /usr/libexec/bslockd -mp -N
1498 ??  I       0:00.01 /usr/sbin/tnetd -N
1500 ??  S       0:04.97 /usr/sbin/chassisd -N
1501 ??  S       0:00.04 /usr/sbin/alarmd -N
1502 ??  I       0:00.40 /usr/sbin/craftd -N
1503 ??  S       0:00.08 /usr/sbin/mgd -N
1506 ??  I       0:00.04 /usr/sbin/inetd -N
1507 ??  I       0:00.00 /usr/sbin/tnp.sntpd -N
1508 ??  I       0:00.00 /usr/sbin/tnp.sntpc -N
1510 ??  S       0:00.01 /usr/sbin/smartd -N
1514 ??  I       0:00.07 /usr/sbin/jcsd -N
1515 ??  S       0:00.18 /usr/sbin/idpd -N
1516 ??  I       0:00.00 /usr/libexec/getty Pc ttyv0
2068 ??  DL      0:00.01 [peer proxy]
2069 ??  DL      0:00.01 [peer proxy]
2070 ??  DL      0:00.01 [peer proxy]
2666 ??  S       0:00.02 /sbin/dcd -N
2667 ??  S       0:00.01 /usr/sbin/irsd -N
2668 ??  S       0:00.01 /usr/sbin/pfed -N
2669 ??  S       0:00.05 /usr/sbin/snmpd -N
2670 ??  S       0:00.01 /usr/sbin/mib2d -N
2671 ??  S       0:00.02 /usr/sbin/dfwd -N
2675 ??  S       0:00.13 /usr/sbin/ksyncd -N
2699 ??  Ss      0:00.00 mgd: (mgd) (root) (mgd)
2700 ??  R       0:00.00 /bin/ps -ax
1138 d0- S       0:00.00 /usr/sbin/usbd -N
1156 d0- S       0:00.37 /usr/sbin/eventd -N -r -s -A
1517 d0  Is+     0:00.00 /usr/libexec/getty std.9600 ttyd0

```

```
lcc2-re0:
```

```

-----
PID  TT  STAT      TIME COMMAND
  0  ??  Wls      0:00.00 [swapper]

```

```

1  ??  ILs    0:00.18 /packages/mnt/jbase/sbin/init --
2  ??  DL     0:00.01 [g_event]
3  ??  DL     0:00.17 [g_up]
4  ??  DL     0:00.12 [g_down]
5  ??  DL     0:00.00 [thread taskq]
6  ??  DL     0:00.00 [kqueue taskq]
7  ??  DL     0:00.00 [pagedaemon]
8  ??  DL     0:00.00 [vmdaemon]
9  ??  DL     0:01.77 [pagezero]
10 ??  DL     0:00.00 [ktrace]
11 ??  RL    17:19.13 [idle]
12 ??  WL     0:00.36 [swi2: net]
13 ??  WL     0:01.20 [swi7: clock sio]
14 ??  WL     0:00.00 [swi6: vm]
15 ??  DL     0:00.13 [yarrow]
16 ??  WL     0:00.00 [swi9: +]
17 ??  WL     0:00.00 [swi8: +]
18 ??  WL     0:00.00 [swi5: cambio]
19 ??  WL     0:00.00 [swi9: task queue]
20 ??  WL     0:03.03 [irq10: bcm0 uhci1*]
21 ??  WL     0:00.02 [irq11: cb0 uhci0+*]
22 ??  DL     0:00.00 [usb0]
23 ??  DL     0:00.00 [usbtask]
24 ??  DL     0:00.00 [usb1]
25 ??  DL     0:00.05 [usb2]
26 ??  DL     0:00.00 [usb3]
27 ??  DL     0:00.00 [usb4]
28 ??  DL     0:00.00 [usb5]
29 ??  DL     0:00.04 [usb6]
30 ??  DL     0:00.00 [usb7]
31 ??  WL     0:00.00 [irq14: ata0]
32 ??  WL     0:00.00 [irq15: ata1]
33 ??  WL     0:00.00 [irq1: atkbd0]
34 ??  WL     0:00.00 [swi0: sio]
35 ??  WL     0:00.00 [swi3: ip6opt ipopt]
36 ??  WL     0:00.00 [swi4: ip6mismatch+]
37 ??  WL     0:00.00 [swi1: ipfwd]
38 ??  DL     0:00.00 [bufdaemon]
39 ??  DL     0:00.00 [vnlru]
40 ??  DL     0:00.01 [syncer]
41 ??  DL     0:00.00 [softdepflush]
42 ??  DL     0:00.00 [netdaemon]
43 ??  DL     0:00.00 [vmuncachedaemon]
44 ??  DL     0:00.00 [if_pic_listen]

```



```

45 ?? DL 0:00.02 [vmkmemdaemon]
46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]
51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.02 [schedcpu]
55 ?? DL 0:00.75 [md0]
77 ?? DL 0:03.48 [md1]
98 ?? DL 0:00.59 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1052 ?? DL 0:00.00 [jsr_kkcm]
1337 ?? SL 0:00.09 [bcmTX]
1338 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1339 ?? SL 0:03.22 [bcmLINK.0]
1344 ?? Is 0:00.00 /usr/sbin/cron
1496 ?? S 0:00.00 /sbin/watchdog -t-1
1497 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1498 ?? S 0:00.01 /usr/sbin/tnetd -N
1500 ?? R 0:05.17 /usr/sbin/chassisd -N
1501 ?? S 0:00.04 /usr/sbin/alarmd -N
1502 ?? I 0:00.39 /usr/sbin/craftd -N
1503 ?? S 0:00.08 /usr/sbin/mgd -N
1506 ?? I 0:00.05 /usr/sbin/inetd -N
1507 ?? I 0:00.00 /usr/sbin/tnp.sntpd -N
1508 ?? I 0:00.00 /usr/sbin/tnp.sntpc -N
1510 ?? S 0:00.01 /usr/sbin/smartd -N
1514 ?? I 0:00.07 /usr/sbin/jcsd -N
1515 ?? S 0:00.17 /usr/sbin/idpd -N
1516 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2591 ?? DL 0:00.01 [peer proxy]
2592 ?? DL 0:00.01 [peer proxy]
2593 ?? DL 0:00.01 [peer proxy]
2597 ?? DL 0:00.00 [peer proxy]
3192 ?? S 0:00.01 /usr/sbin/irsd -N
3193 ?? S 0:00.05 /usr/sbin/snmpd -N

```

```

3194 ?? S      0:00.02 /sbin/dcd -N
3195 ?? S      0:00.01 /usr/sbin/pfed -N
3196 ?? S      0:00.01 /usr/sbin/mib2d -N
3197 ?? S      0:00.02 /usr/sbin/dfwd -N
3198 ?? S      0:00.13 /usr/sbin/ksyncd -N
3228 ?? Ss     0:00.00 mgd: (mgd) (root) (mgd)
3229 ?? R      0:00.00 /bin/ps -ax
1138 d0- S      0:00.00 /usr/sbin/usbd -N
1156 d0- S      0:00.42 /usr/sbin/eventd -N -r -s -A
1517 d0 Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
...

```

show system processes sfc (TX Matrix Plus Router)

user@host> show system processes sfc 0

sfc0-re0:

```

-----
PID  TT  STAT      TIME COMMAND
  0  ??  Wls      0:00.00 [swapper]
  1  ??  SLs      0:00.18 /packages/mnt/jbase/sbin/init --
  2  ??  DL       0:00.20 [g_event]
  3  ??  DL       0:00.39 [g_up]
  4  ??  DL       0:00.32 [g_down]
  5  ??  DL       0:00.00 [thread taskq]
  6  ??  DL       0:00.09 [kqueue taskq]
  7  ??  DL       0:00.01 [pagedaemon]
  8  ??  DL       0:00.00 [vmdaemon]
  9  ??  DL       0:06.63 [pagezero]
 10  ??  DL       0:00.00 [ktrace]
 11  ??  RL      312:09.00 [idle]
 12  ??  WL       0:11.07 [swi2: net]
 13  ??  WL       0:27.70 [swi7: clock sio]
 14  ??  WL       0:00.00 [swi6: vm]
 15  ??  DL       0:03.03 [yarrow]
 16  ??  WL       0:00.00 [swi9: +]
 17  ??  WL       0:00.00 [swi8: +]
 18  ??  WL       0:00.00 [swi5: cambio]
 19  ??  WL       0:00.00 [swi9: task queue]
 20  ??  WL       0:11.46 [irq16: uhci0 uhci*]
 21  ??  DL       0:00.00 [usb0]
 22  ??  DL       0:00.00 [usbtask]
 23  ??  WL       0:39.63 [irq17: uhci1 uhci*]
 24  ??  DL       0:00.00 [usb1]

```

```

25 ?? WL      0:00.00 [irq18: uhci2 uhci*]
26 ?? DL      0:00.84 [usb2]
27 ?? DL      0:00.00 [usb3]
28 ?? DL      0:00.00 [usb4]
29 ?? DL      0:00.00 [usb5]
30 ?? DL      0:00.73 [usb6]
31 ?? DL      0:00.00 [usb7]
32 ?? WL      0:00.00 [irq14: ata0]
33 ?? WL      0:00.00 [irq15: ata1]
34 ?? WL      0:00.00 [irq1: atkbd0]
35 ?? WL      0:00.00 [swi0: sio]
36 ?? WL      0:00.00 [irq11: isab0]
37 ?? WL      0:00.00 [swi3: ip6opt ipopt]
38 ?? WL      0:00.00 [swi4: ip6mismatch+]
39 ?? WL      0:00.00 [swi1: ipfwd]
40 ?? DL      0:00.02 [bufdaemon]
41 ?? DL      0:00.02 [vnlru]
42 ?? DL      0:00.39 [syncer]
43 ?? DL      0:00.05 [softdepflush]
44 ?? DL      0:00.00 [netdaemon]
45 ?? DL      0:00.02 [vmuncachedaemon]
46 ?? DL      0:00.00 [if_pic_listen]
47 ?? DL      0:00.35 [vmkmemdaemon]
48 ?? DL      0:00.00 [cb_poll]
49 ?? DL      0:00.06 [if_pfe_listen]
50 ?? DL      0:00.00 [scs_housekeeping]
51 ?? IL      0:00.00 [kern_dump_proc]
52 ?? IL      0:00.00 [nfsiod 0]
53 ?? IL      0:00.00 [nfsiod 1]
54 ?? IL      0:00.00 [nfsiod 2]
55 ?? IL      0:00.00 [nfsiod 3]
56 ?? DL      0:00.37 [schedcpu]
57 ?? DL      0:00.56 [md0]
79 ?? DL      0:02.58 [md1]
100 ?? DL     0:00.03 [md2]
118 ?? DL     0:00.01 [md3]
139 ?? DL     0:00.95 [md4]
160 ?? DL     0:00.12 [md5]
181 ?? DL     0:00.00 [md6]
217 ?? DL     0:00.02 [md7]
227 ?? DL     0:00.05 [md8]
1341 ?? SL    0:01.35 [bcmTX]
1342 ?? SL    0:01.69 [bcmXGS3AsyncTX]
1343 ?? SL    0:41.57 [bcmLINK.0]

```

```

1345 ?? SL      0:33.97 [bcmLINK.1]
1350 ?? Is      0:00.01 /usr/sbin/cron
1502 ?? S       0:00.01 /sbin/watchdog -t-1
1503 ?? S       0:00.86 /usr/libexec/bslockd -mp -N
1504 ?? I       0:00.01 /usr/sbin/tnetd -N
1507 ?? S       0:01.32 /usr/sbin/alarmd -N
1508 ?? S       0:14.54 /usr/sbin/craftd -N
1509 ?? S       0:01.20 /usr/sbin/mgd -N
1512 ?? S       0:00.05 /usr/sbin/inetd -N
1513 ?? S       0:00.10 /usr/sbin/tnp.sntpd -N
1517 ?? S       0:00.11 /usr/sbin/smartd -N
1525 ?? S       0:01.11 /usr/sbin/idpd -N
1526 ?? S       0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
1527 ?? I       0:00.01 /usr/libexec/getty Pc ttyv0
1616 ?? DL      0:00.30 [peer proxy]
1617 ?? DL      0:00.32 [peer proxy]
1618 ?? DL      0:00.34 [peer proxy]
1619 ?? DL      0:00.30 [peer proxy]
2391 ?? Is      0:00.01 telnetd
7331 ?? Ss      0:00.03 telnetd
9538 ?? DL      0:01.16 [jsr_kkcm]
9613 ?? DL      0:00.18 [peer proxy]
23781 ?? Ss     0:00.01 telnetd
23926 ?? Ss     0:00.03 mgd: (mgd) (user)/dev/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/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      0:00.31 /usr/sbin/cosd
45735 ?? I      0:00.00 /usr/sbin/rtspd -N
45736 ?? S      0:00.06 /usr/sbin/fsad -N
45737 ?? S      0:00.05 /usr/sbin/rdd -N
45738 ?? S      0:00.10 /usr/sbin/pppd -N
45739 ?? S      0:00.05 /usr/sbin/dfcd -N
45740 ?? S      0:00.08 /usr/sbin/lfmd -N

```

```

45741 ?? S      0:00.01 /usr/sbin/mplsoamd -N
45742 ?? I      0:00.01 /usr/sbin/sendd -N
45743 ?? S      0:00.08 /usr/sbin/appidd -N
45744 ?? S      0:00.05 /usr/sbin/mspd -N
45745 ?? S      0:00.27 /usr/sbin/jdiameterd -N
45746 ?? S      0:00.10 /usr/sbin/pfed -N
45747 ?? S      0:00.19 /usr/sbin/lpdfd -N
45748 ?? S      0:00.64 /sbin/dcd -N
45750 ?? S      0:00.46 /usr/sbin/mib2d -N
45751 ?? S      0:00.16 /usr/sbin/dfwd -N
45752 ?? S      0:00.15 /usr/sbin/irsd -N
45764 ?? S      0:20.60 /usr/sbin/snmpd -N
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 [vnlru_mem]
63 ?? DL      1:51.66 [syncer]
64 ?? DL      0:20.22 [vnlru]
65 ?? DL      0:40.48 [softdepflush]
66 ?? DL      0:00.00 [netdaemon]
67 ?? DL    20:47.67 [vmkmemdaemon]
68 ?? DL      0:00.00 [if_pfe_listen]
69 ?? SL      0:02.80 [kdm_checkkcore]
70 ?? SL      0:03.34 [kdm_savekcore]
71 ?? SL      0:04.31 [kdm_livekcore]
72 ?? SL      0:06.14 [kdm_logger]
73 ?? SL      0:04.31 [kdm_kdb]
74 ?? SL      0:00.02 [devrt_kernel_thread]
75 ?? DL      0:21.54 [vmuncachedaemon]

```

```

76 ?? DL      0:00.00 [if_pic_listen0]
77 ?? SL      0:00.00 [nfsiod 0]
78 ?? SL      0:00.00 [nfsiod 1]
79 ?? SL      0:00.00 [nfsiod 2]
80 ?? SL      0:00.00 [nfsiod 3]
81 ?? WL      5:59.98 [irq13: +]
82 ?? RL      105:06.81 [pkt_sender: cpu0]
83 ?? DL      0:03.62 [md0]
95 ?? DL      0:37.04 [md1]
115 ?? DL     0:06.01 [md2]
135 ?? DL     0:00.75 [md3]
155 ?? DL     0:21.17 [md4]
175 ?? DL     0:01.90 [md5]
195 ?? DL     0:06.26 [md6]
231 ?? DL     0:00.01 [md7]
755 ?? Ss     0:04.17 /usr/sbin/cron
847 ?? S      0:00.10 /usr/sbin/tnetd -N
849 ?? S      0:06.82 /usr/sbin/mgd -N
850 ?? S      0:00.32 /usr/sbin/inetd -N
852 ?? S      1:05.34 /usr/sbin/dhcpd -N
853 ?? S      0:00.18 /usr/sbin/inetd -p /var/run/inetd_4.pid -N -JU __juni
855 ?? L      1181:02.21 /usr/sbin/dc-pfe -N (pafxpc)
857 ?? S      17:55.86 /usr/sbin/vccpd -N
896 ?? S      93:43.45 /usr/sbin/chassism -N
953 ?? S      0:02.89 /sbin/watchdog -t-1
954 ?? S      3:34.00 /sbin/dcd -N
955 ?? S      10:30.13 /usr/sbin/chassisd -N
956 ?? DL     0:00.21 [peer proxy]
957 ?? S      4:07.43 /usr/sbin/alarmd -N
958 ?? S      0:31.69 /usr/sbin/craftd -N
959 ?? S      0:55.16 /usr/sbin/mib2d -N
960 ?? S      3:40.64 /usr/sbin/rpd -N
961 ?? S      0:00.03 /usr/sbin/tnp.sntpd -N
962 ?? S      0:51.94 /usr/sbin/pfed -N
963 ?? S      0:47.31 /usr/sbin/rmopd -N
964 ?? S      0:33.65 /usr/sbin/cosd
965 ?? S      1:48.41 /usr/sbin/ppmd -N
966 ?? S      0:07.18 /usr/sbin/dfwd -N
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 processes (Junos OS Evolved)

user@host> show system processes

```

-----
node: re0
-----

```

UID	PID	PPID	C	SZ	RSS	PSR	STIME	TTY	TIME	CMD
root	1	0	0	44805	3932	7	01:04	?	00:00:05	/sbin/init
--dump-core										
root	2	0	0	0	0	0	01:04	?	00:00:00	[kthreadd]
root	3	2	0	0	0	0	01:04	?	00:00:00	[ksoftirqd/0]
root	4	2	0	0	0	0	01:04	?	00:00:00	[kworker/0:0]
root	5	2	0	0	0	0	01:04	?	00:00:00	[kworker/0:0H]
root	7	2	0	0	0	12	01:04	?	00:00:01	[rcu_preempt]
root	8	2	0	0	0	10	01:04	?	00:00:00	[rcu_sched]
root	9	2	0	0	0	7	01:04	?	00:00:00	[rcu_bh]

```

root      10      2  0    0    0  0 01:04 ?      00:00:00 [migration/0]
root      11      2  0    0    0  0 01:04 ?      00:00:00 [lru-add-drain]
root      12      2  0    0    0  0 01:04 ?      00:00:00 [watchdog/0]
root      13      2  0    0    0  0 01:04 ?      00:00:00 [cpuhp/0]
root      14      2  0    0    0  1 01:04 ?      00:00:00 [cpuhp/1]
root      15      2  0    0    0  1 01:04 ?      00:00:00 [watchdog/1]
root      16      2  0    0    0  1 01:04 ?      00:00:00 [migration/1]
root      17      2  0    0    0  1 01:04 ?      00:00:00 [ksoftirqd/1]
root      19      2  0    0    0  1 01:04 ?      00:00:00 [kworker/1:0H]
root      20      2  0    0    0  2 01:04 ?      00:00:00 [cpuhp/2]
root      21      2  0    0    0  2 01:04 ?      00:00:00 [watchdog/2]
root      22      2  0    0    0  2 01:04 ?      00:00:00 [migration/2]
root      23      2  0    0    0  2 01:04 ?      00:00:00 [ksoftirqd/2]
root      25      2  0    0    0  2 01:04 ?      00:00:00 [kworker/2:0H]
root      26      2  0    0    0  3 01:04 ?      00:00:00 [cpuhp/3]
root      27      2  0    0    0  3 01:04 ?      00:00:00 [watchdog/3]
root      28      2  0    0    0  3 01:04 ?      00:00:00 [migration/3]
[...Output truncated...]

```

show system processes summary (Junos OS Evolved)

user@host> show system processes summary

```

-----
node: re0
-----

top - 01:21:32 up 17 min,  2 users,  load average: 1.04, 1.80, 2.62
Tasks: 507 total,  2 running, 500 sleeping,  0 stopped,  5 zombie
%Cpu(s):  3.6 us,  4.1 sy,  0.0 ni, 90.9 id,  1.2 wa,  0.2 hi,  0.1 si,  0.0 st
KiB Mem : 65279088 total, 49666040 free, 12422932 used,  3190116 buff/cache
KiB Swap: 4194300 total,  4194300 free,          0 used. 51959124 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR S  %CPU  %MEM    TIME+  COMMAND
 8159 root       20   0 7216964 1.039g  8892 S   52.9   1.7   4:50.07 evo-cda-zx
10197 root       20   0  20128   2524   1924 R   11.8   0.0    0:00.05 top
21433 root       20   0 8840868 1.769g 33536 S   11.8   2.8   0:36.76 EvoAftMan-main

 9964 root       20   0 6621652 112280  11324 R    5.9   0.2   1:31.12 fabspoked-fchip
 9982 root       20   0 5979936 487596  25116 S    5.9   0.7    0:03.21 distributord

```

show system processes brief (Junos OS Evolved)

```
user@host> show system processes brief
```

```
-----
node: re0
-----

top - 21:09:13 up  2:27,  2 users,  load average: 1.38, 1.28, 1.18
Tasks: 501 total,   1 running, 497 sleeping,   0 stopped,   3 zombie
%Cpu(s):  2.6 us,  1.3 sy,   0.0 ni, 95.6 id,   0.3 wa,   0.1 hi,   0.1 si,   0.0 st
KiB Mem : 65279088 total, 48095148 free, 12979856 used,  4204084 buff/cache
KiB Swap: 4194300 total,  4194300 free,           0 used. 51357720 avail Mem
```

show system processes detail (Junos OS Evolved)

```
user@host> show system processes detail
```

```
-----
node: re0
-----
```

F	S	UID	PID	PPID	PGID	SID	C	PRI	NI	ADDR	SZ	WCHAN	RSS	PSR	STIME	TTY	
			TIME	CMD													
4	S	root	1	0	1	1	0	80	0	-	44795	ep_pol	2904	4	18:41	?	
			00:00:05	/sbin/init --dump-core													
1	S	root	2	0	0	0	0	80	0	-	0	kthrea	0	21	18:41	?	
			00:00:00	[kthreadd]													
1	S	root	3	2	0	0	0	80	0	-	0	smpboo	0	0	18:41	?	
			00:00:00	[ksoftirqd/0]													
1	S	root	4	2	0	0	0	80	0	-	0	worker	0	0	18:41	?	
			00:00:00	[kworker/0:0]													
1	S	root	5	2	0	0	0	60	-20	-	0	worker	0	0	18:41	?	
			00:00:00	[kworker/0:0H]													
1	S	root	7	2	0	0	0	80	0	-	0	rcu_gp	0	5	18:41	?	
			00:00:10	[rcu_preempt]													
1	S	root	8	2	0	0	0	80	0	-	0	rcu_gp	0	15	18:41	?	
			00:00:00	[rcu_sched]													
1	S	root	9	2	0	0	0	80	0	-	0	rcu_gp	0	0	18:41	?	
			00:00:00	[rcu_bh]													
1	S	root	10	2	0	0	0	-40	-	-	0	smpboo	0	0	18:41	?	
			00:00:00	[migration/0]													
1	S	root	11	2	0	0	0	60	-20	-	0	rescue	0	0	18:41	?	
			00:00:00	[lru-add-drain]													
5	S	root	12	2	0	0	0	-40	-	-	0	smpboo	0	0	18:41	?	
			00:00:00	[watchdog/0]													

```

1 S root      13      2      0      0 0 80  0 -      0 smpboo      0  0 18:41 ?
    00:00:00 [cpuhp/0]
1 S root      14      2      0      0 0 80  0 -      0 smpboo      0  1 18:41 ?
    00:00:00 [cpuhp/1]

```

show system processes extensive (Junos OS Evolved)

user@host> show system processes extensive

```

-----
node: re0
-----

top - 21:10:49 up  2:29,  3 users,  load average: 0.80, 1.10, 1.12
Tasks: 509 total,  1 running, 505 sleeping,  0 stopped,  3 zombie
%Cpu(s):  2.6 us,  1.3 sy,  0.0 ni, 95.6 id,  0.3 wa,  0.1 hi,  0.1 si,  0.0 st
KiB Mem : 65279088 total, 47994284 free, 13071596 used,  4213208 buff/cache
KiB Swap: 4194300 total, 4194300 free,  0 used. 51265912 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR S  %CPU  %MEM     TIME+ COMMAND
 6375 root       20   0   20128   2700   1928 R   16.7   0.0    0:00.05 top
 8822 root       20   0 7222720 1.036g  4428 S   11.1   1.7   22:41.15 evo-cda-zx
10813 root       20   0 5823736 97292   8656 S    5.6   0.1    4:05.68 picd
   1 root       20   0  179180   3800    896 S    0.0   0.0    0:05.74 systemd
   2 root       20   0      0      0      0 S    0.0   0.0    0:00.00 kthreadd
   3 root       20   0      0      0      0 S    0.0   0.0    0:00.09 ksoftirqd/0
   4 root       20   0      0      0      0 S    0.0   0.0    0:00.05 kworker/0:0
   5 root        0 -20      0      0      0 S    0.0   0.0    0:00.00 kworker/0:0H
   7 root       20   0      0      0      0 S    0.0   0.0    0:10.34 rcu_preempt
   8 root       20   0      0      0      0 S    0.0   0.0    0:00.01 rcu_sched
   9 root       20   0      0      0      0 S    0.0   0.0    0:00.00 rcu_bh
  10 root       rt    0      0      0      0 S    0.0   0.0    0:00.09 migration/0
  11 root        0 -20      0      0      0 S    0.0   0.0    0:00.00 lru-add-drain

  12 root       rt    0      0      0      0 S    0.0   0.0    0:00.00 watchdog/0
  13 root       20   0      0      0      0 S    0.0   0.0    0:00.00 cpuhp/0
  14 root       20   0      0      0      0 S    0.0   0.0    0:00.00 cpuhp/1
  15 root       rt    0      0      0      0 S    0.0   0.0    0:00.00 watchdog/1
....

```

show system processes wide (Junos OS Evolved)

user@host> show system processes wide

```
-----
node: re0
-----
```

UID	PID	PPID	C	SZ	RSS	PSR	STIME	TTY	TIME	CMD
root	1	0	0	44795	2904	9	18:41	?	00:00:05	/sbin/init
--dump-core										
root	2	0	0	0	0	21	18:41	?	00:00:00	[kthreadd]
root	3	2	0	0	0	0	18:41	?	00:00:00	[ksoftirqd/0]
root	4	2	0	0	0	0	18:41	?	00:00:00	[kworker/0:0]
root	5	2	0	0	0	0	18:41	?	00:00:00	[kworker/0:0H]
root	7	2	0	0	0	10	18:41	?	00:00:10	[rcu_preempt]
root	8	2	0	0	0	7	18:41	?	00:00:00	[rcu_sched]
root	9	2	0	0	0	0	18:41	?	00:00:00	[rcu_bh]
root	10	2	0	0	0	0	18:41	?	00:00:00	[migration/0]
root	11	2	0	0	0	0	18:41	?	00:00:00	[lru-add-drain]
root	12	2	0	0	0	0	18:41	?	00:00:00	[watchdog/0]
root	13	2	0	0	0	0	18:41	?	00:00:00	[cpuhp/0]

show system queues

List of Syntax

[Syntax on page 374](#)

[Syntax \(TX Matrix Router\) on page 374](#)

[Syntax \(TX Matrix Plus Router\) on page 374](#)

[Syntax \(MX Series Router\) on page 374](#)

Syntax

```
show system queues
```

Syntax (TX Matrix Router)

```
show system queues
<all-chassis| all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show system queues
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)

```
show system queues
<all-members>
<local>
<member member-id>
```

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

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 the TX Matrix Plus router.

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.

all-members—(MX Series routers only) (Optional) Display system queue statistics for 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 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.

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

List of Sample Output

[show system queues on page 377](#)

Output Fields

Table 17 on page 376 lists the output fields for the **show system queues** command. Output fields are listed in the approximate order in which they appear.

Table 17: 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. • ipop, 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 reboot

List of Syntax

[Syntax on page 378](#)

[Syntax \(EX Series and MX Series\) on page 378](#)

[Syntax \(TX Matrix Router\) on page 378](#)

[Syntax \(TX Matrix Plus Router\) on page 378](#)

[Syntax \(QFX Series and OCX Series\) on page 378](#)

Syntax

```
show system reboot  
<both-routing-engines>
```

Syntax (EX Series and MX Series)

```
show system reboot  
<all-members>  
<both-routing-engines>  
<local>  
<member member-id>
```

Syntax (TX Matrix Router)

```
show system reboot  
<all-chassis | all-lcc | lcc number | scc>  
<both-routing-engines>
```

Syntax (TX Matrix Plus Router)

```
show system reboot  
<all-chassis| all-lcc | lcc number | sfc number>  
<both-routing-engines>
```

Syntax (QFX Series and OCX Series)

```
show system reboot  
<both-routing-engines>  
<infrastructure name>  
<interconnect-device name>  
<node-device name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display pending system reboots or halts.

Options

none—Display pending reboots or halts on the active Routing Engine.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for all the T640 routers in the chassis that are connected to the TX Matrix router. On a TX Matrix 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-icc—(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.

icc *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 381](#)

[show system reboot all-lcc \(TX Matrix Router\) on page 381](#)

[show system reboot sfc \(TX Matrix Plus Router\) on page 381](#)

[show system reboot \(QFX3500 Switch\) on page 381](#)

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 snapshot

List of Syntax

[Syntax on page 382](#)

[Syntax \(EX Series Switches\) on page 382](#)

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. You can find which platforms run Junos OS with Upgraded FreeBSD here: *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](#) | [235](#)

List of Sample Output

- [show system snapshot \(Router\) on page 383](#)
- [show system snapshot \(Junos OS Evolved\) on page 384](#)
- [show system snapshot media external \(Switch\) on page 384](#)
- [show system snapshot media internal \(Switch\) on page 385](#)

Output Fields

[Table 18 on page 383](#) lists the output fields for the **show system snapshot** command. Output fields are listed in the approximate order in which they appear.

Table 18: 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 (Junos OS Evolved)

user@host> show system snapshot

```

-----
node: re0
-----
Current snapshot device: /dev/sdb
Snapshot boot device: sdb
List of installed version(s) in Snapshot boot device sdb:
[1] -> junos-linux-install-ptx-fixed-x86-64-18.4-20180819.2 -
[2018-08-21 07:26:13]
      '-' running version
      '>' next boot version
      '<' rollback boot version

```

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/dals2a) (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 386](#)

[Syntax \(EX Series Switches\) on page 386](#)

[Syntax \(TX Matrix Router\) on page 386](#)

[Syntax \(TX Matrix Plus Router\) on page 386](#)

[Syntax \(QFX Series\) on page 386](#)

Syntax

```
show system software
<detail>
```

Syntax (EX Series Switches)

```
show system software
<all-members>
<detail>
<local>
<member member-id>
```

Syntax (TX Matrix Router)

```
show system software
<all-chassis | all-lcc | lcc number | scc>
<detail>
```

Syntax (TX Matrix Plus Router)

```
show system software
<all-chassis | all-lcc | lcc number | sfc number>
<detail>
```

Syntax (QFX Series)

```
show system software
<detail>
<infrastructure name>
<interconnect-device name>
<node-group name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the Junos OS extensions loaded on your router or switch.

Options

none—Display standard information about all loaded Junos OS extensions.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system software information for all the T640 routers (TX Matrix Router) or all the routers (TX Matrix Plus Router) in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system software information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches only) (Optional) Display the system software running on all members of the Virtual Chassis configuration.

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 388](#)

[show system software \(TX Matrix Plus Router\) on page 389](#)

[show system software \(QFX Series\) on page 394](#)

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-bgf:

Comment:

JUNOS Border Gateway Function package [9.6-20090515.0]

Information for jservices-idp:

Comment:

JUNOS IDP Services [9.6-20090515.0]

Information for jservices-llpdf:

Comment:

JUNOS Services LL-PDF Container package [9.6-20090515.0]

Information for jservices-sfw:

Comment:

JUNOS Services Stateful Firewall [9.6-20090515.0]

Information for jservices-voice:

Comment:

JUNOS Voice Services Container package [9.6-20090515.0]

Information for junos:

Comment:

JUNOS Base OS boot [9.6-20090515.0]

...

lcc0-re0:

Information for jbase:

Comment:

JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [9.6-20090515.0]

Information for jdocs:

Comment:

JUNOS Online Documentation [9.6-20090515.0]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [9.6-20090515.0]

Information for jpfe:

Comment:

JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]

Information for jpfe-common:

Comment:

JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]

Information for jroute:

Comment:

JUNOS Routing Software Suite [9.6-20090515.0]

Information for jservices-aacl:

Comment:

JUNOS Services ACL Container package [9.6-20090515.0]

Information for jservices-appid:

Comment:

JUNOS AppId Services [9.6-20090515.0]

Information for jservices-bgf:

Comment:

JUNOS Border Gateway Function package [9.6-20090515.0]

Information for jservices-idp:

Comment:

JUNOS IDP Services [9.6-20090515.0]

Information for jservices-llpdf:

Comment:

JUNOS Services LL-PDF Container package [9.6-20090515.0]

Information for jservices-sfw:

```

Comment:
JUNOS Services Stateful Firewall [9.6-20090515.0]

Information for jservices-voice:

Comment:
JUNOS Voice Services Container package [9.6-20090515.0]

Information for junos:

Comment:
JUNOS Base OS boot [9.6-20090515.0]

lcc1-re0:
-----
Information for jbase:

Comment:
JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [9.6-20090515.0]
...

```

show system software (QFX Series)

```
user@switch> show system software
```

```

Information for jbase:

Comment:
JUNOS Base OS Software Suite [11.3-20110730.0]

```

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [11.3-20110730.0]

Information for jdocs:

Comment:

JUNOS Online Documentation [11.3-20110730.0]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [11.3-20110730.0]

Information for jpfe:

Comment:

JUNOS Packet Forwarding Engine Support (QFX) [11.3-20110730.0]

Information for jroute:

Comment:

JUNOS Routing Software Suite [11.3-20110730.0]

Information for jswitch:

Comment:

JUNOS Enterprise Software Suite [11.3-20110730.0]

Information for junos:

Comment:

JUNOS Base OS boot [11.3-20110730.0]

Information for jweb:

Comment:

JUNOS Web Management [11.3-20110730.0]

show system statistics

List of Syntax

[Syntax on page 397](#)

[Syntax \(EX Series Switches\) on page 397](#)

[Syntax \(TX Matrix Router\) on page 397](#)

[Syntax \(TX Matrix Plus Router\) on page 397](#)

[Syntax \(MX Series Router\) on page 397](#)

[Syntax \(QFX Series\) on page 397](#)

Syntax

```
show system statistics
```

Syntax (EX Series Switches)

```
show system statistics  
<all-members>  
<local>  
<member member-id>
```

Syntax (TX Matrix Router)

```
show system statistics  
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show system statistics  
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)

```
show system statistics  
<all-members>  
<local>  
<member member-id>  
<extended <ipv4 | ipv6>>
```

Syntax (QFX Series)

```
show system statistics
```

Release Information

Command introduced before JUNOS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display system-wide protocol-related statistics.

Options

none—Display system statistics for all the following protocols:

- **arp**—Address Resolution Protocol
- **bridge**—IEEE 802.1 Bridging
- **clns**—Connectionless Network Service
- **esis**—End System-to-Intermediate System
- **ethoamcfm**—Ethernet OAM protocol for connectivity fault management
- **ethoamlfm**—Ethernet OAM protocol for link fault management
- **extended**—System statistics for IPv4 and IPv6 traffic
- **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 400](#)

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 subtype init
0 IHA messages sent for subtype init
0 IHA messages rcvd for subtype init
0 IHA messages sent for subtype init
0 IHA messages rcvd for subtype init
0 IHA messages sent for subtype init
0 IHA messages rcvd for subtype 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 rcvd
0 SDRL ipc messages rcvd
0 SDRL primary replication messages sent
0 SDRL primary replication message send failures
0 SDRL primary ack messages received
0 SDRL primary ack message receive failures
0 SDRL primary sock replication inits
0 SDRL primary sock replication init failures
0 SDRL primary throttle remove messages
0 SDRL primary throttle remove failures
0 SDRL primary init handshake messages
0 SDRL primary init handshake failures
0 SDRL secondary replication messages received
0 SDRL secondary replication message receive failures
0 SDRL secondary replication acks sent
0 SDRL secondary replication ack send failures
0 SDRL secondary sock splits
0 SDRL secondary sock split failures
0 SDRL secondary sock merges
0 SDRL secondary sock merge failures

```

```

0 SDRL secondary sockets closed
0 SDRL secondary rcv snoop fd close failures
0 SDRL secondary snd snoop fd close failures
0 SDRL secondary init handshake messages
0 SDRL secondary init handshake failures
PRL:
0 PRL packets enqueued
0 PRL packets failed to enqueue
0 PRL packets dequeued
0 PRL packets failed to dequeue
0 PRL queue entry allocations
0 PRL queue entry frees
0 calls to layer 4 input handlers
0 failed calls to layer 4 input handlers
0 PRL queue drains
0 PRL replication timeouts
0 PRL replication messages sent
0 PRL replication message send failures
0 PRL acknowledgment messages sent
0 PRL acknowledgement message send failures
0 PRL replication messages received
0 PRL replication message receive failures
0 PRL acknowledgement messages received
0 PRL acknowledgement receive failures
0 PRL messages with bad IPC type
0 PRL messages with no handler
2 PRL global state initializations
1 PRL global state cleanups
0 PRL per-socket state creations
0 PRL per-socket state creation failures
0 PRL per-socket state cleanups
0 PRL socket closes
0 PRL socket merges
0 PRL socket unreplicates
0 PRL primary socket replication initializations
0 PRL secondary socket replication initializations
0 PRL primary socket replication activations
0 PRL secondary socket replication activations
0 packets received from peers
0 PRL packets receive operations from peer failed
0 PRL buffer pullup failures
0 new pkts dropped on secondary socket
PSRM:
0 PSRM replication timeouts

```

```

    0 PSRM replication messages sent
    0 PSRM replication message send failures
    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 storage

List of Syntax

[Syntax on page 414](#)

[Syntax \(EX Series Switches and MX Series Routers\) on page 414](#)

[Syntax \(QFX Series\) on page 414](#)

[Syntax \(SRX Series\) on page 414](#)

[Syntax \(TX Matrix Router\) on page 414](#)

[Syntax \(TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs\) on page 415](#)

[Syntax \(Junos OS Evolved\) on page 415](#)

Syntax

```
show system storage
<detail>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (EX Series Switches and MX Series Routers)

```
show system storage
<detail>
<all-members>
<local>
<member member-id>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (QFX Series)

```
show system storage
<detail>
<infrastructure name>
<interconnect-device name>
<node-group name>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (SRX Series)

```
show system storage
<detail>
<partitions>
```

Syntax (TX Matrix Router)


```
show system storage
<detail>
<all-chassis | all-lcc | lcc number | scc>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs)

```
show system storage
<detail>
<all-chassis | all-lcc | lcc number | sfc number>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (Junos OS Evolved)

```
show system storage
<detail>
<node node-name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Option **invoke-on (all-routing-engines | other-routing-engine)** introduced in Junos OS Release 14.1

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

node option introduced in Junos OS Evolved Release 18.3R1.

Description

Display statistics about the amount of free disk space in the router's or switch's file systems.

Options

none—Display standard information about the amount of free disk space in the router's or switch's file systems.

detail—(Optional) Display detailed output.

invoke-on all-routing-engines—(Optional) Display the system storage information on all master and backup Routing Engines on a routing matrix based on the TX Matrix or TX Matrix Plus router or on a router that has dual Routing Engines.

invoke-on other-routing-engines—(Optional) Display the system storage information on the other Routing Engine. For example, if you issue this command on the master Routing Engine on an M320 router, the JUNOS Software displays the system storage information on the backup Routing Engine. On a routing

matrix based on the TX Matrix or TX Matrix Plus router, if you issue this command on the TX Matrix or TX Matrix Plus router's master Routing Engine, the JUNOS Software displays all the system storage information on all the backup Routing Engines.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system storage statistics for all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for all routers connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for all members of the Virtual Chassis configuration.

infrastructure *name*—(QFabric systems only) (Optional) Display system storage statistics for the fabric control Routing Engines or fabric manager Routing Engines.

interconnect-device *name*—(QFabric systems only) (Optional) Display system storage statistics for the Interconnect device.

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

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

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

local—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the local Virtual Chassis member.

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

node—(Junos OS Evolved only) (Optional) Display system storage statistics for the specified node.

node-group *name*—(QFabric systems only) (Optional) Display system storage statistics for the Node group.

scc—(TX Matrix routers only) (Optional) Display system storage statistics for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display system storage statistics for the TX Matrix Plus router. Replace *number* with 0.

Additional Information

By default, when you issue the **show system storage** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

RELATED DOCUMENTATION

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show system storage on page 418](#)

[show system storage \(SRX Series\) on page 418](#)

[show system storage node on page 419](#)

[show system storage node detail on page 420](#)

Output Fields

[Table 19 on page 417](#) describes the output fields for the **show system storage** command. Output fields are listed in the approximate order in which they appear.

Table 19: show system storage Output Fields

Field Name	Field Description	Level of Detail
Filesystem	Name of the filesystem.	all
Size	Size of the filesystem. Size is reported in human readable form (GB or MB, etc.).	standard output
1024-blocks	Size of the filesystem. Size is reported in bytes.	detail
Used	Amount of space used in the filesystem.	all (see note)
Avail	Amount of space available in the filesystem.	all (see note)

Table 19: show system storage Output Fields (*continued*)

Field Name	Field Description	Level of Detail
Capacity	Percentage of the filesystem space that is being used.	all
Mounted on	Directory in which the filesystem is mounted.	all

NOTE: In detailed output, the output is in bytes, whereas in regular output, the size is in human-readable form (like GB or MB, etc.).

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 (SRX Series)

```
user@host> show system storage
```

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/da0s1a	2.4G	369M	1.9G	16%	/

devfs	1.0K	1.0K	0B	100%	/dev
/dev/md0	20M	11M	6.7M	63%	/junos
/cf/packages	2.4G	369M	1.9G	16%	/junos/cf/packages
devfs	1.0K	1.0K	0B	100%	/junos/cf/dev
/dev/md1	1.2G	1.2G	0B	100%	/junos
/cf	20M	11M	6.7M	63%	/junos/cf
devfs	1.0K	1.0K	0B	100%	/junos/dev/
/cf/packages	2.4G	369M	1.9G	16%	/junos/cf/packages1
procfs	4.0K	4.0K	0B	100%	/proc
/dev/bo0s3e	185M	74K	170M	0%	/config
/dev/bo0s3f	2.1G	1.7G	219M	89%	/cf/var
/dev/md2	1.0G	90M	859M	10%	/mfs
/cf/var/jail	2.1G	1.7G	219M	89%	/jail/var
/cf/var/log	2.1G	1.7G	219M	89%	/jail/var/log
devfs	1.0K	1.0K	0B	100%	/jail/dev
/dev/md3	1.8M	4.0K	1.7M	0%	/jail/mfs

show system storage node

user@host> show system storage node re1

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/root	44M	44M	0	100%	/pivot
devtmpfs	7.8G	0	7.8G	0%	/dev
/dev/sda2	16G	4.9G	11G	33%	/soft
/dev/sda5	3.0G	122M	2.7G	5%	/etc
/dev/sda6	1000M	1.3M	932M	1%	/config
/dev/sda7	16G	9.4G	5.4G	64%	/var
/dev/sda1	189M	5.3M	170M	4%	/boot
/dev/loop0	1.8G	1.8G	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/ccd-ptx-re64					
/dev/loop1	14M	14M	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/perl-5.20.0					
/dev/loop2	94M	94M	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/java					
/dev/loop3	2.4M	2.4M	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/modules					
/dev/loop4	9.4M	9.4M	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/zookeeper					
/dev/loop5	57M	57M	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/python-2.7					
/dev/loop6	14M	14M	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/python-3.3					
/dev/loop7	191M	191M	0	100%	

```

/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/dev
/dev/loop8          3.8M      3.8M      0      100%
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/jimbase
/dev/loop9          103M      103M      0      100%
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/osbase
/dev/loop10         44M       44M       0      100%
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/initrd
unionfs             5.2G      2.4G      2.7G    48%  /
/tmp                7.8G      4.0K      7.8G    1%  /tmp
run                 7.8G      7.1M      7.8G    1%  /run
tmpfs               7.8G      1.2G      6.7G    15%  /dev/shm
tmpfs               7.8G      0         7.8G    0%   /sys/fs/cgroup
tmpfs               1.6G      0         1.6G    0%   /run/user/0

```

show system storage node detail

user@host> show system storage node re1 detail

Filesystem	1024-blocks	Used	Avail	Capacity	Mounted on
/dev/root	44376	44376	0	100%	/pivot
devtmpfs	8103560	0	8103560	0%	/dev
/dev/sda2	16513960	5057236	10601480	33%	/soft
/dev/sda5	3055376	124232	2757476	5%	/etc
/dev/sda6	1023892	1308	953772	1%	/config
/dev/sda7	16310696	9809324	5656368	64%	/var
/dev/sda1	193242	5418	173561	4%	/boot
/dev/loop0	1816864	1816864	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/ccd-ptx-re64					
/dev/loop1	13432	13432	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/perl-5.20.0					
/dev/loop2	95344	95344	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/java					
/dev/loop3	2384	2384	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/modules					
/dev/loop4	9528	9528	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/zookeeper					
/dev/loop5	57816	57816	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/python-2.7					
/dev/loop6	13320	13320	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/python-3.3					
/dev/loop7	195024	195024	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/dev					
/dev/loop8	3872	3872	0	100%	
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/jimbase					

```

/dev/loop9          105272      105272          0      100%
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/osbase
/dev/loop10         44376       44376           0      100%
/pivot/data/junos-install-qfx-x86-64-16.2I20170508115447_evo-builder/initrd
unionfs             5412608     2481464     2757476      48%  /
/tmp                8127388         4     8127384       1%  /tmp
run                 8127388       7216     8120172       1%  /run
tmpfs               8127388    1190096     6937292      15%  /dev/shm
tmpfs               8127388         0     8127388       0%  /sys/fs/cgroup
tmpfs               1625480         0     1625480       0%  /run/user/0

```

show system switchover

List of Syntax

[Syntax on page 422](#)

[Syntax \(TX Matrix Router\) on page 422](#)

[Syntax \(TX Matrix Plus Router\) on page 422](#)

[Syntax \(MX Series Router\) on page 422](#)

Syntax

```
show system switchover
```

Syntax (TX Matrix Router)

```
show system switchover
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show system switchover
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)

```
show system switchover
<all-members>
<local>
<member member-id>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos 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 426](#)

[show system switchover \(Backup Routing Engine - Not Ready\) on page 426](#)

[show system switchover all-lcc \(Routing Matrix and Routing Matrix Plus\) on page 427](#)

Output Fields

[Table 20 on page 425](#) describes the output fields for the **show system switchover** command. Output fields are listed in the approximate order in which they appear.

Table 20: show system switchover Output Fields

Field Name	Field Description
Graceful switchover	<p>Display graceful Routing Engine switchover status:</p> <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.
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 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 428](#)

[Syntax \(EX Series Switches\) on page 428](#)

[Syntax \(QFX Series\) on page 428](#)

[Syntax \(TX Matrix Router\) on page 428](#)

[Syntax \(TX Matrix Plus Router\) on page 428](#)

[Syntax \(MX Series Router\) on page 428](#)

[Syntax \(Junos OS Evolved\) on page 429](#)

Syntax

```
show system uptime
```

Syntax (EX Series Switches)

```
show system uptime  
<all-members>  
<local>  
<member member-id>
```

Syntax (QFX Series)

```
show system uptime  
<director-group name>  
<infrastructure name>  
<interconnect-device name>  
<node-group name>
```

Syntax (TX Matrix Router)

```
show system uptime  
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show system uptime  
<detail>  
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)

```
show system uptime
<all-members>
<invoke-on>
<local>
<member member-id>
```

Syntax (Junos OS Evolved)

```
show system uptime
<node node-name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in JUNOS 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.

node option introduced in Junos OS Evolved Release 18.3R1.

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.

The **show system uptime** command is a little different in how it displays output in Junos OS Evolved. The **show system uptime** command by itself shows system-wide uptime information. Use the **show system uptime node *node-name*** command to see node-specific uptime information, where ***node-name*** can be **re0** | **re1** | **fpc0** | **all**.

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 node-name—(Junos OS Evolved only) (Optional) Display uptime information for the specified node. When **node** option is not used, display uptime information for entire system. From the system's point of view, the system booted time is the time when the system was assembled and is available in `/var/run/system_boot_time`.

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 432](#)

[show system uptime node \(for Junos OS Evolved\) on page 432](#)

[show system uptime \(QFX Series\) on page 433](#)

[show system uptime \(Junos OS Evolved\) on page 433](#)

[show system uptime node re0 \(Junos OS Evolved\) on page 433](#)

Output Fields

[Table 21 on page 431](#) describes the output fields for the **show system uptime** command. Output fields are listed in the approximate order in which they appear.

Table 21: show system uptime Output Fields

Field Name	Field Description
System booted	(Only for Junos OS Evolved when node option is not used) Time system was last booted. From the system's point of view, the system booted time is the time when the system was assembled and is available in <code>/var/run/system_boot_time</code> .
System-wide users	(Only for Junos OS Evolved when node option is not used) Number of system-wide users.
Current time	Current system time in UTC.

Table 21: show system uptime Output Fields (*continued*)

Field Name	Field Description
Time Source	Reference time source that the system is locked to.
System booted	Date and time when the Routing Engine on the router or switch was last booted and how long it has been running.
Protocols started	Date and time when the routing protocols were last started and how long they have been running.
Last configured	Date and time when a configuration was last committed. Also shows the name of the user who issued the last commit command.
time and up	Current time, in the local time zone, and how long the router or switch has been operational.
users	Number of users logged in to the router or switch.
load averages	Load averages for the last 1 minute, 5 minutes, and 15 minutes.

Sample Output

show system uptime

```
user@host> show system uptime
```

```
Current time:      2017-10-13 19:45:47 UTC
Time Source:      NTP CLOCK
System booted:    2017-10-12 20:51:41 UTC (22:54:06 ago)
Protocols started: 2017-10-13 19:33:45 UTC (00:12:02 ago)
Last configured:  2017-10-13 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 node (for Junos OS Evolved)

```
user@host> show system uptime node re0
```

```
Current time: 2017-05-16 16:13:18 PDT
Node booted: 2017-05-10 15:45:29 PDT (6d 00:27 ago)
```

```
Last configured: 2017-05-10 15:31:46 PDT (6d 00:41 ago) by root
16:13:18 up 6 days, 27 min, 1 user, load averages: 2.69, 2.58, 2.57
```

show system uptime (QFX Series)

```
user@switch> show system uptime
```

```
Current time: 2017-08-27 03:12:30 PDT
Time Source: NTP CLOCK
System booted: 2017-08-13 17:11:54 PDT (1w6d 10:00 ago)
Protocols started: 2017-08-13 17:13:56 PDT (1w6d 09:58 ago)
Last configured: 2017-08-26 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 uptime (Junos OS Evolved)

```
user@router> show system uptime
```

```
System booted: 2019-02-20 19:17:52 PST (02:20:33 ago)
System-wide users: 7 users
```

Starting in Junos OS Evolved 19.1R1 release, the **show system uptime** output displays only the **System booted** and **System-wide users** information. The output does not display the details such as **Current time**, **System booted**, **Protocols started**, and **Last configured parameters**. To see node-specific uptime information, use the **node** option.

show system uptime node re0 (Junos OS Evolved)

```
user@router> show system uptime node re0
```

```
Current time: 2019-07-09 14:24:34 PDT
Time Source: NTP CLOCK
Node booted: 2019-07-03 09:59:58 PDT (6d 04:24 ago)
Protocols started: 2019-07-03 10:01:41 PDT (6d 04:22 ago)
Last configured: 2019-07-03 10:01:10 PDT (6d 04:23 ago) by root
2:24PM up 6 days, 4:24, 1 user, load averages: 1.25, 0.51, 0.36
```

show system virtual-memory

List of Syntax

[Syntax on page 434](#)

[Syntax \(EX Series\) on page 434](#)

[Syntax \(TX Matrix Router\) on page 434](#)

[Syntax \(TX Matrix Plus Router\) on page 434](#)

[Syntax \(MX Series Router\) on page 434](#)

[Syntax \(QFX Series\) on page 434](#)

[Syntax \(Junos OS Evolved\) on page 435](#)

Syntax

```
show system virtual-memory
```

Syntax (EX Series)

```
show system virtual-memory  
<all-members>  
<local>  
<member member-id>
```

Syntax (TX Matrix Router)

```
show system virtual-memory  
<all-chassis | all-lcc | lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show system virtual-memory  
<all-chassis | all-lcc | lcc number | sfc number>
```

Syntax (MX Series Router)

```
show system virtual-memory  
<all-members>  
<local>  
<member member-id>
```

Syntax (QFX Series)

```
show system virtual-memory
<infrastructure name>
<interconnect-device name>
<node-group name>
```

Syntax (Junos OS Evolved)

```
show system virtual-memory
<node node-name>
```

Release Information

Command introduced before Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

node option introduced in Junos OS Evolved Release 18.3R1.

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 *node-name*—(Junos OS Evolved only) (Optional) Display the kernel memory information for the specified node. If no node is specified, information is displayed for all nodes.

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 439](#)
- [show system virtual-memory \(Junos OS Evolved without node specified\) on page 445](#)
- [show system virtual-memory scc \(TX Matrix Router\) on page 458](#)
- [show system virtual-memory sfc \(TX Matrix Plus Router\) on page 459](#)
- [show system virtual-memory | display xml on page 464](#)
- [show system virtual-memory \(QFX Series\) on page 494](#)

Output Fields

[Table 22 on page 438](#) lists the output fields for the **show system virtual-memory** command. Output fields are listed in the approximate order in which they appear.

Table 22: 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.

Table 22: show system virtual-memory Output Fields (*continued*)

Field Name	Field Description
Size(s)	Memory block sizes this type is using.
Memory Totals	
In Use	Total kernel dynamic memory in use (bytes, rounded up).
Free	Total kernel dynamic memory free (bytes, rounded up).
Requests	Total number of memory allocation requests.
ITEM	Kernel module that is using memory.
Size	Memory block size (bytes).
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, iffamilly
256 iflogical, iftable, MFS node, FFS node, newblk, temp, devbuf,
    NFS daemon, vnodes, proc-args, kqueue, file desc, Gzip trees, bus,
    subproc, itable16, ifstate, pfe_ipc, sysctl, rtnexthop
512 UFS mount, temp, devbuf, mount, BIO buffer, ptys, ttys, AR driver,
    Gzip trees, ISOFS mount, msg, ioctlops, ATA generic, bus, proc,
    pfestat, lr, ifstate, pfe_ipc, rtable, ipfw, ifstat, rtnexthop
1K  iftable, temp, devbuf, NQNFS Lease, kqueue, kld, AD driver,
```

```

        Gzip trees, sem, MD disk, bus, ifstate, pfe_ipc, ipfw
2K  uc_devlist, UFS mount, temp, devbuf, BIO buffer, pcb, AR driver,
        Gzip trees, 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	64
atkbddev	2	1K	1K127753K		2	0	0	32
uc_devlist	24	3K	3K127753K		24	0	0	16,2K
nexusdev	3	1K	1K127753K		3	0	0	16
memdesc	1	4K	4K127753K		1	0	0	4K
mbuf	1	152K	152K127753K		1	0	0	256K
iflogical	6	2K	2K127753K		6	0	0	256
iftable	17	9K	9K127753K		18	0	0	16,64,256,1K,4K
ZONE	15	2K	2K127753K		15	0	0	128
VM pgdata	1	64K	64K127753K		1	0	0	64K
UFS mount	12	26K	26K127753K		12	0	0	512,2K,4K
UFS ihash	1	128K	128K127753K		1	0	0	128K
MFS node	6	2K	3K127753K		35	0	0	64,256
FFS node	906	227K	227K127753K		1352	0	0	256
dirrem	0	0K	4K127753K		500	0	0	32
mkdir	0	0K	1K127753K		38	0	0	32
diradd	0	0K	6K127753K		521	0	0	32
freefile	0	0K	4K127753K		374	0	0	32
freeblks	0	0K	8K127753K		219	0	0	128
freefrag	0	0K	1K127753K		193	0	0	32
allocindir	0	0K	25K127753K		1518	0	0	64
indirdep	0	0K	17K127753K		76	0	0	32,16K
allocdirect	0	0K	10K127753K		760	0	0	64
bmsafemap	0	0K	1K127753K		72	0	0	32
newblk	1	1K	1K127753K		2279	0	0	32,256
inodedep	1	128K	175K127753K		2367	0	0	128,128K
pagedep	1	32K	33K127753K		47	0	0	64,32K
temp	1239	92K	96K127753K		8364	0	0	16,32,64K
devbuf	1413	5527K	5527K127753K		1535	0	0	16,32,64,128,256
lockf	38	3K	3K127753K		2906	0	0	64

atexit	1	1K	1K127753K	1	0	0	16
zombie	0	0K	2K127753K	3850	0	0	128
NFS hash	1	128K	128K127753K	1	0	0	128K
NQNFs Lease	1	1K	1K127753K	1	0	0	1K
NFS daemon	1	1K	1K127753K	1	0	0	256
syncache	1	8K	8K127753K	1	0	0	8K
COS	353	44K	44K127753K	353	0	0	16,32,64,128
BPF	189	3K	3K127753K	189	0	0	16
MSDOSFS mount	1	64K	64K127753K	1	0	0	64K
NULLFS hash	1	1K	1K127753K	1	0	0	64
DEVFS mount	2	1K	1K127753K	2	0	0	16
DEVFS name	487	31K	31K127753K	487	0	0	64
DEVFS node	471	58K	58K127753K	479	0	0	16,128
vnodes	28	7K	7K127753K	429	0	0	16,32,64,128,256
mount	15	8K	8K127753K	18	0	0	16,128,512
cluster_save buffer	0	0K	1K127753K	55	0	0	32,64
vfscache	1898	376K	376K127753K	3228	0	0	64,128,256K
BIO buffer	49	98K	398K127753K	495	0	0	512,2K
pcb	159	16K	17K127753K	399	0	0	16,32,64,128,2K
soname	82	10K	10K127753K	42847	0	0	16,32,64,128
proc-args	57	2K	3K127753K	2105	0	0	16,32,64,128,256
ptys	32	16K	16K127753K	32	0	0	512
ttys	254	33K	33K127753K	522	0	0	128,512
kqueue	5	3K	4K127753K	23	0	0	256,1K
sigio	1	1K	1K127753K	27	0	0	32
file	383	24K	24K127753K	16060	0	0	64
file desc	76	19K	20K127753K	3968	0	0	256
shm	1	12K	12K127753K	1	0	0	16K
dev_t	286	36K	36K127753K	286	0	0	128
timecounter	10	2K	2K127753K	10	0	0	128
kld	11	117K	122K127753K	34	0	0	16,32,128,1K,4K
AR driver	1	1K	3K127753K	5	0	0	64,512,2K
AD driver	2	2K	3K127753K	2755	0	0	64,1K
Gzip trees	0	0K	46K127753K	133848	0	0	32,64,128,256
ISOFS node	1136	142K	142K127753K	1189	0	0	128
ISOFS mount	9	132K	132K127753K	10	0	0	512,128K
sem	3	6K	6K127753K	3	0	0	1K,4K
MD disk	2	2K	2K127753K	2	0	0	16,1K
msg	4	25K	25K127753K	4	0	0	512,4K,16K
rman	59	4K	4K127753K	461	0	0	16,64
ioctlops	0	0K	2K127753K	992	0	0	512,2K
taskqueue	2	1K	1K127753K	2	0	0	32
SWAP	2	413K	413K127753K	2	0	0	32,512K
ATA generic	6	3K	3K127753K	6	0	0	16,512

eventhandler	17	1K	1K127753K	17	0	0	32,64
bus	340	30K	31K127753K	794	0	0	16,32,64,128,256
sysctl	0	0K	1K127753K	130262	0	0	16,32,64
uidinfo	4	1K	1K127753K	10	0	0	32,128
cred	22	3K	3K127753K	3450	0	0	128
subproc	156	10K	10K127753K	7882	0	0	32,64,256
proc	2	1K	1K127753K	2	0	0	512
session	12	2K	2K127753K	34	0	0	128
pgrp	16	1K	1K127753K	45	0	0	32
ippool	1	1K	1K127753K	1	0	0	16
pfestat	0	0K	1K127753K	47349	0	0	16,32,64,512
pic	5	1K	1K127753K	5	0	0	64,128
lr	1	1K	1K127753K	1	0	0	512
itable32	110	4K	4K127753K	110	0	0	32
itable16	161	26K	26K127753K	161	0	0	128,256
ifstate	694	159K	160K127753K	1735	0	0	16,32,64,128,1K
pfe_ipc	0	0K	1K127753K	56218	0	0	16,32,64,128,1K
mkey	250	4K	4K127753K	824	0	0	16,32,64
ifaddr	9	1K	1K127753K	9	0	0	64
sysctl	0	0K	1K127753K	30	0	0	256
rtable	49	6K	6K127753K	307	0	0	16,32,64,128,512
ifmaddr	22	1K	1K127753K	22	0	0	16,32
ipfw	23	10K	10K127753K	48	0	0	16,32,64,512,2K
ifstat	698	805K	805K127753K	698	0	0	128,512,2K
rcache	4	8K	8K127753K	4	0	0	2K
rnnode	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 the 64-bit platform.

show system virtual-memory (Junos OS Evolved without node specified)

```
user@host> show system virtual-memory
```

```

-----
node: re0
-----
MemTotal:      65279088 kB
MemFree:       48808876 kB
MemAvailable:  51433640 kB
Buffers:       282100 kB
Cached:        2904576 kB
SwapCached:    0 kB
Active:        11247396 kB
Inactive:      2003420 kB
Active(anon):  10069532 kB
Inactive(anon): 198920 kB

```

Active(file): 1177864 kB
Inactive(file): 1804500 kB
Unevictable: 432 kB
Mlocked: 432 kB
SwapTotal: 4194300 kB
SwapFree: 4194300 kB
Dirty: 6920 kB
Writeback: 0 kB
AnonPages: 8907208 kB
Mapped: 904096 kB
Shmem: 203960 kB
Slab: 1617436 kB
SReclaimable: 371936 kB
SUnreclaim: 1245500 kB
KernelStack: 25088 kB
PageTables: 104088 kB
NFS_Unstable: 0 kB
Bounce: 0 kB
WritebackTmp: 0 kB
CommitLimit: 36833844 kB
Committed_AS: 37399048 kB
VmallocTotal: 34359738367 kB
VmallocUsed: 0 kB
VmallocChunk: 0 kB
HardwareCorrupted: 0 kB
AnonHugePages: 6772736 kB
ShmemHugePages: 0 kB
ShmemPmdMapped: 0 kB
CmaTotal: 0 kB
CmaFree: 0 kB
HugePages_Total: 0
HugePages_Free: 0
HugePages_Rsvd: 0
HugePages_Surp: 0
Hugepagesize: 2048 kB
DirectMap4k: 17280 kB
DirectMap2M: 1679360 kB
DirectMap1G: 67108864 kB

	CPU0	CPU1	CPU2	CPU3	CPU4	CPU5	CP
U6	CPU7	CPU8	CPU9	CPU10	CPU11	CPU12	
CPU13							
	CPU14	CPU15	CPU16	CPU17	CPU18	CPU19	
CPU20							

		CPU21	CPU22	CPU23			
0:	201	0	0	0	0	0	
	0	0	0	0	0	0	0
0		0	0	0	0	0	0
	0	0	0	0	IR-IO-APIC	2-edge	timer
4:	19033	0	0	0	0	0	
	0	0	0	0	0	0	0
0		0	0	0	0	0	0
	0	0	0	0	IR-IO-APIC	4-edge	serial
8:	1	0	0	0	0	0	
	0	0	0	0	0	0	0
0		0	0	0	0	0	0
	0	0	0	0	IR-IO-APIC	8-edge	rtc0
9:	0	0	0	0	0	0	
	0	0	0	0	0	0	0
0		0	0	0	0	0	0
	0	0	0	0	IR-IO-APIC	9-fasteoi	acpi
16:	29	0	0	0	0	0	
	0	0	0	0	0	0	0
0		0	0	0	0	0	0
	0	0	0	0	IR-IO-APIC	16-fasteoi	
ehci_hcd:usb1							
23:	33	0	0	0	0	0	
	0	0	0	0	0	0	0
0		0	0	0	0	0	0
	0						

```

                                0          0          0  IR-IO-APIC  23-fasteoi
ehci_hcd:usb2
25:          0          0          0          0          0          0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
      0          0          0          0          0          0          0
PCie PME, pcie
      hp
26:          0          0          0          0          0          0          0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
PCie PME, pcie
      hp
28:          0          0          0          0          0          0          0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
PCie PME, pcie
      hp
29:          2          0          0          0          0          0          0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
PCie PME, pcie
      hp
31:          2          0          0          0          0          0          0
      0          0          0          0          0          0          0
0
      0          0          0          0          0          0          0
0

```

		0	0	0	IR-PCI-MSI 49152-edge	aerdrv,
PCIe PME, pcie		hp				
32:	2	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 51200-edge	aerdrv,
PCIe PME, pcie		hp				
33:	0	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 53248-edge	aerdrv,
PCIe PME, pcie		hp				
34:	0	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 55296-edge	aerdrv,
PCIe PME, pcie		hp				
35:	0	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 458752-edge	PCIe
PME						
36:	0	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					

		0	0	0	IR-PCI-MSI 462848-edge	PCie
PME, pciehp						
37:	0	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 464896-edge	PCie
PME, pciehp						
38:	0	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 466944-edge	PCie
PME, pciehp						
40:	2	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 3670016-edge	
supercon-core						
41:	0	0	0	2	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	supercon-core irq-supercon.7	
42:	318320	0	0	0	0	0
	0	0	0	0	0	0
0		0	0	0	0	0
	0					
		0	0	0	IR-PCI-MSI 512000-edge	
ahci[0000:00:1f.2]						
43:	1	0	0	0	0	0
	0	0	0	0	0	0

0								
		0	0	0	0	0	0	
0								
		0	0	0	IR-PCI-MSI	5242880-edge		eth0
44:	33426	0	0	0	0	0		
0		0	0	0	0	0	0	
0								
		0	0	0	0	0	0	
0								
		0	0	0	IR-PCI-MSI	5242881-edge		
eth0-TxRx-0								
45:	22440	0	0	0	0	0		
0		0	0	0	0	0	0	
0								
		0	0	0	0	0	0	
0								
		0	0	0	IR-PCI-MSI	5242882-edge		
eth0-TxRx-1								
46:	33406	0	0	0	0	0		
0		0	0	0	0	0	0	
0								
		0	0	0	0	0	0	
0								
		0	0	0	IR-PCI-MSI	5242883-edge		
eth0-TxRx-2								
47:	39499	0	0	0	0	0		
0		0	0	0	0	0	0	
0								
		0	0	0	0	0	0	
0								
		0	0	0	IR-PCI-MSI	5242884-edge		
eth0-TxRx-3								
48:	0	0	0	0	0	0		
0		0	0	0	0	0	0	
0								
		0	0	0	0	0	0	
0								
		0	0	0	DMAR-MSI	0-edge		dmar0

```

49:      42167      0      0      0      0      0
      0      0      0      0      0      0      0
0
      0      0      0      0      0      0      0
0
      0      0      0 IR-PCI-MSI 5767168-edge      eth1
50:      12584      0      0      0      0      0
      0      0      0      0      0      0      0
0
      0      0      0      0      0      0      0
0
      0      0      0 IR-PCI-MSI 5767169-edge
eth1-TxRx-0
51:      12584      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 IR-PCI-MSI 5767170-edge      eth1-TxRx-1
52:      12584      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 IR-PCI-MSI 5767171-edge      eth1-TxRx-2
53:      12584      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 IR-PCI-MSI 5767172-edge      eth1-TxRx-3
54:      0      0      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 IR-PCI-MSI 327680-edge      xhci_hcd
55:      0      0      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 irq-supercon 34      cb0
56:      0      0      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 irq-supercon 88      cb0
57:      0      0      0      0      0      0      0
0      0      0      0      0      0      0
      0      0      0      0      0      0      0
      0      0      0 irq-supercon 20      fan0

```

```

58:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
59:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
60:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
61:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
62:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
63:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
64:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
65:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
66:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
67:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
68:      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0

```

```

69:      0      0      0      1      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
70:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
71:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
72:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
---(backing up)---
26:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
28:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
29:      2      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
31:      2      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
32:      2      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
33:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
34:      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0

```



```

0      0      0  IR-PCI-MSI 55296-edge      aerdrv, PCIe PME, pciehp
35:    0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 458752-edge      PCIe PME
36:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 462848-edge      PCIe PME, pciehp
37:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 464896-edge      PCIe PME, pciehp
38:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 466944-edge      PCIe PME, pciehp
40:    2      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 3670016-edge      supercon-core
41:    0      0      0      0      2      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  supercon-core irq-supercon.7
42:  318320      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 512000-edge      ahci[0000:00:1f.2]
43:    1      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 5242880-edge      eth0
44:  33426      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 5242881-edge      eth0-TxRx-0
45:  22440      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0
0      0      0  IR-PCI-MSI 5242882-edge      eth0-TxRx-1
46:  33406      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0

```



```

0      0      0 irq-supercon 20 fan0
58:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 76 fan0
59:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 21 fan1
60:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 77 fan1
61:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 22 fan2
62:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 78 fan2
63:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 23 fan3
64:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 79 fan3
65:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 24 fan4
66:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 80 fan4
67:    0      0      0      0      1      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0 irq-supercon 38 cb0
68:    0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0      0      0

```

```

0      0      0  irq-supercon  90  cb0
69:    0      0      0      0      1      0      0
0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0
0      0      0  irq-supercon  32  cb0
70:    0      0      0      0      0      0      0
0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0
0      0      0  irq-supercon  11  psm0
71:    0      0      0      0      0      0      0
0      0      0      0      0      0      0      0
      0      0      0      0      0      0      0
0      0      0  irq-supercon  71  psm0
[...Output truncated...]
```

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_gent, COS, vnodes,
...

Memory statistics by type
Type  Kern
Type  InUse MemUse HighUse  Limit Requests Limit Limit Size(s)
  isadev    12    1K    1K166400K    12    0    0    64
  atkbddev    2    1K    1K166400K    2    0    0    32
  uc_devlist  24    3K    3K166400K    24    0    0  16,2K
....
```

```
Memory Totals:  In Use      Free      Requests
                  6091K      1554K      2897122
```

show system virtual-memory sfc (TX Matrix Plus Router)

```
user@host> show system virtual-memory sfc 0
```

```
sfc0-re0:
-
      Type InUse MemUse HighUse Requests  Size(s)
CAM dev queue      1      1K      -         1    64
      entropy  1024     64K      -    1024    64
      linker   487   6272K      -    1163 16,32,64,4096,32768,131072
      USB     127     10K      -     127 16,32,64,128,256,1024,2048
      lockf     46      3K      -   98418    64
      USBdev    10      2K      -        34 16,128,2048,16384
ifstateSLLNode      0      0K      -    1096    16
      devbuf 21243 15683K      -    21810
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
      temp   1283    151K      -  2483472
16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072
      ip6ndp      0      0K      -         4    64
      in6ifmulti  1      1K      -         1    64
      in6grentry  1      1K      -         1    64
      iflogical  20      5K      -        29   2048
      iffamily   45      6K      -        69 32,1024,2048
      rtnexthop  266     46K      -   608013 32,256,512,1024,2048,4096
      metrics    31      4K      -         54   256
      rnode     212      4K      -   607848 16,32
      rcache      4      8K      -          4 65536
      iflist      0      0K      -          6 16,64
      ifdevice   11      8K      -         17 16,32768
      ifstat    424     472K      -        427 512,16384,65536
      ipfw       42     23K      -        145
16,32,64,128,256,512,1024,16384,32768,65536,131072
      ifmaddr    415     11K      -        415 16,32
      rtable    329     28K      -   608066 16,32,64,128,1024,16384
      sysctl      0      0K      -   887976 16,32,64,4096,16384,32768
      ifaddr     64      5K      -         70 32,64,128
      mkey      331      6K      -    12528 16,128
      pfe_ipc     0      0K      -   7299115
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
      ifstate 1245054 70088K      -   3040437
```

```

16,32,64,128,256,512,1024,2048,4096,8192,16384,32768
  idxbucket      1      1K      -      1  16
  itable16    5069   1250K      -    5103 1024,4096
  itable32     157    10K      -     157  64
  itable64      2     1K      -       2 128
    lr          1     1K      -       4 16384
    pic         37     6K      -     37 64,16384
  pfestat       0     0K      -    6220 32,64,128,256,131072
  gencfg      1486   424K      -    2614 16,32,64,256,512,16384,32768,65536
  jsr          2     1K      -      22 16
  idl          1     4K      -     165

32,64,128,256,512,1024,2048,8192,16384,32768,65536,131072
  rtmsg         0     0K      -      16 131072
  module       250    16K      -     250 64,128
  mtx_pool      1     8K      -       1 64,128
  DEVFS3       113    13K      -     114 256
  DEVFS1       106    24K      -     106 2048
  pgrp         15     1K      -    8600 64
  session      11     2K      -    2829 512
  proc         2     1K      -       2 16384
  subproc      296   572K      -   24689 2048,131072
  cred         38     5K      -   619244 256
  plimit       18     4K      -    21311 2048
  uidinfo       3     1K      -      10 32,512
  sysctluid    2701   82K      -    2701 16,32,64
  sysctltmp     0     0K      -   15572 16,32,64,1024
  umtx        171    11K      -     171 64
  SWAP         2    277K      -       2 64
  bus         779   125K      -    3072 16,32,64,128,32768
  bus-sc       67    62K      -    1477

16,32,64,512,1024,2048,8192,16384,65536,131072
  devstat       8    17K      -       8 16,131072
  eventhandler  46     2K      -      47 32,128
    kobj       93   186K      -     111 65536
  DEVFS         8     1K      -       9 16,64
  rman        106     7K      -     490 16,32,64
  sbuf         0     0K      -   28234 16,32,32768,131072

...
lcc0-re0:
-
      Type InUse MemUse HighUse Requests Size(s)
CAM dev queue      1     1K      -       1 64
  entropy    1024    64K      -    1024 64
  linker     487   6272K      -    1163 16,32,64,4096,32768,131072

```

USB	127	10K	-	127	16,32,64,128,256,1024,2048
lockf	23	2K	-	169585	64
USBdev	10	2K	-	34	16,128,2048,16384
devbuf	5128	10760K	-	5310	
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072					
temp	1285	151K	-	10770	
16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072					
ip6ndp	0	0K	-	4	64
iflogical	20	5K	-	29	2048
iffamily	45	6K	-	69	32,1024,2048
rtnexthop	189	29K	-	1211988	32,256,512,1024,2048,4096
metrics	11	2K	-	16	256
rnode	135	3K	-	606391	16,32
rcache	4	8K	-	4	65536
iflist	0	0K	-	6	16,64
ifdevice	11	8K	-	17	16,32768
ifstat	412	471K	-	415	512,16384,65536
ipfw	42	23K	-	91	
16,32,64,128,256,512,1024,16384,32768,65536,131072					
ifmaddr	415	11K	-	415	16,32
rtable	225	20K	-	606584	16,32,64,128,1024,16384
sysctl	0	0K	-	2302479	16,32,64
ifaddr	53	4K	-	69	32,64,128
mkey	133	3K	-	8974	16,128
pfe_ipc	0	0K	-	19035108	
16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072					
ifstate	710270	42176K	-	9583703	
16,32,64,128,256,512,1024,2048,8192,16384,32768					
idxbucket	1	1K	-	1	16
itable16	5045	1245K	-	1825178	1024,4096
itable32	157	10K	-	157	64
itable64	2	1K	-	2	128
lr	1	1K	-	4	16384
pic	37	6K	-	37	64,16384
pfestat	0	0K	-	1682	32,64,128,256,131072
gencfg	1486	424K	-	2812	16,32,64,256,512,16384,32768,65536
jsr	0	0K	-	22	16
idl	0	0K	-	4	32768,131072
rtsmg	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	0K	-	55 32,64
VFS hash	1	256K	-	1	32,64
vnodes	1	1K	-	1	512
mount	266	21K	-	481	16,32,64,128,256,4096,32768
vnodemarker	0	0K	-	2497	16384
pfs_nodes	25	3K	-	25	128
pfs_vncache	144	5K	-	386	32
STP	1	1K	-	1	64
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.lb      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>ingrenentry</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>sysctlloid</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>
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    <memstat-name>GEOM</memstat-name>
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    <memuse>11</memuse>
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    <memstat-req>1042</memstat-req>

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    <memstat-name>syncache</memstat-name>
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    <memuse>8</memuse>
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    <memstat-req>1</memstat-req>

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    <memuse>0</memuse>
    <high-use>-</high-use>
    <memstat-req>8</memstat-req>

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    <memstat-name>p1003.1b</memstat-name>
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    <memstat-name>MD disk</memstat-name>
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    <memstat-size>65536</memstat-size>
    <memstat-name>ata_generic</memstat-name>
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<memstat-name>UMAHash</memstat-name>
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<memstat-name>cdev</memstat-name>
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<memstat-name>VM pgdata</memstat-name>
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<memstat-name>kenv</memstat-name>
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```

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<memstat-name>legacydrv</memstat-name>
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```

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    <memstat-size>131072</memstat-size>
    <memstat-name>nexusdev</memstat-name>
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    <memuse>1</memuse>
    <high-use>-</high-use>
    <memstat-req>2</memstat-req>
    <memstat-size>16</memstat-size>
    <memstat-name>CAM queue</memstat-name>
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    <memuse>1</memuse>
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    <memstat-req>3</memstat-req>
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    <memuse>1</memuse>
    <high-use>-</high-use>
    <memstat-req>4</memstat-req>
    <memstat-size>32</memstat-size>
    <memstat-name>KTRACE</memstat-name>
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    <memuse>10</memuse>
    <high-use>-</high-use>
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    <memstat-size>128</memstat-size>
    <memstat-name>kbdmux</memstat-name>
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    <memuse>9</memuse>
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<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>tcpb:</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: cbbl 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>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>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>

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<memstat-name>kobj</memstat-name>
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<memuse>186</memuse>
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<memstat-name>ptys</memstat-name>
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<memuse>1</memuse>
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<memstat-name>pcb</memstat-name>
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  <high-use>-</high-use>
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  <memstat-size>65536</memstat-size>
  <memstat-name>vfscache</memstat-name>
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  <memuse>256</memuse>
  <high-use>-</high-use>
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  <memstat-size>65536</memstat-size>
  <memstat-name>cluster_save buffer</memstat-name>
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  <memuse>0</memuse>
  <high-use>-</high-use>
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  <memstat-name>VFS hash</memstat-name>
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  <high-use>-</high-use>

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    <memstat-name>p1003.1b</memstat-name>
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    <memuse>1</memuse>
    <high-use>--</high-use>
    <memstat-req>1</memstat-req>
    <memstat-size>16</memstat-size>
    <memstat-name>MD disk</memstat-name>
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    <high-use>--</high-use>
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    <memstat-size>65536</memstat-size>
    <memstat-name>ata_generic</memstat-name>
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    <high-use>--</high-use>
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    <memstat-name>ISofs mount</memstat-name>
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    <memuse>1</memuse>
    <high-use>--</high-use>
    <memstat-req>15</memstat-req>
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    <high-use>--</high-use>

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<memstat-name>CAM periph</memstat-name>
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<memstat-req>69</memstat-req>
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<memstat-name>legacydrv</memstat-name>
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<memstat-name>CAM queue</memstat-name>
<inuse>3</inuse>

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```

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    <high-use>--</high-use>
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    <high-use>--</high-use>
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    <memstat-name>kbdmux</memstat-name>
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    <zone-name>UMA Zones:</zone-name>
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    <zone-name>UMA Slabs:</zone-name>
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    <zone-name>UMA RCntSlabs:</zone-name>
    <zone-size>104</zone-size>

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```

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<zone-req>10259</zone-req>

```

```

<zone-name>64:</zone-name>
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<free>61</free>
<zone-req>942</zone-req>
<zone-name>160:</zone-name>
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<zone-req>577</zone-req>
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<zone-req>1950</zone-req>
<zone-name>256:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
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<free>36</free>
<zone-req>1225</zone-req>
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<zone-size>288</zone-size>

```

```

<count-limit>0</count-limit>
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<zone-size>512</zone-size>
<count-limit>0</count-limit>
<used>49</used>
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<zone-size>1024</zone-size>
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<count-limit>0</count-limit>
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<zone-name>Files:</zone-name>
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<zone-name>MAC labels:</zone-name>
<zone-size>20</zone-size>
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<zone-size>544</zone-size>
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<used>116</used>

```

```

<free>10</free>
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<zone-name>mbuf_packet:</zone-name>
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<count-limit>180000</count-limit>
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<free>128</free>
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<zone-name>mbuf:</zone-name>
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```



```

<zone-name>mbuf_cluster:</zone-name>
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<zone-name>mbuf_jumbo_pagesize:</zone-name>
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```

```

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<zone-name>VNODE:</zone-name>
<zone-size>292</zone-size>
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<zone-req>2922</zone-req>
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```

```

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<zone-size>404</zone-size>
<count-limit>0</count-limit>
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<zone-req>717</zone-req>
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<zone-name>unpcb:</zone-name>
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<zone-name>ipq:</zone-name>
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<zone-name>udpcb:</zone-name>
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<used>19</used>
<free>32</free>
<zone-req>31</zone-req>

```

```

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<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>
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<zone-req>105</zone-req>
<zone-name>tcptw:</zone-name>
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<zone-req>5</zone-req>
<zone-name>SWAPMETA:</zone-name>
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```

```

    <count-limit>94948</count-limit>
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    <zone-name>FFS inode:</zone-name>
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    <count-limit>0</count-limit>
    <used>1146</used>
    <free>72</free>
    <zone-req>1306</zone-req>
    <zone-name>FFS1 dinode:</zone-name>
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    <count-limit>0</count-limit>
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<vmstat-sumstat>
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    <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>
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    <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-deamon>0</pages-freed-by-deamon>
  <pages-freed-by-exiting-proc>75630</pages-freed-by-exiting-proc>
  <pages-active>45826</pages-active>
  <pages-inactive>13227</pages-inactive>
  <pages-in-vm-cache>49278</pages-in-vm-cache>
  <pages-wired-down>10640</pages-wired-down>
  <pages-free>70706</pages-free>
  <bytes-per-page>4096</bytes-per-page>
  <swap-pages-used>0</swap-pages-used>
  <peak-swap-pages-used>0</peak-swap-pages-used>
  <total-name-lookups>214496</total-name-lookups>
  <positive-cache-hits>92</positive-cache-hits>
  <negative-cache-hits>5</negative-cache-hits>
  <pass2>0</pass2>
  <cache-deletions>0</cache-deletions>
  <cache-falsehits>0</cache-falsehits>
  <toolong>0</toolong>
</vmstat-sumstat>
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  <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: cbbl 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
rtsmg	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
iffamily	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
  syncache     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.lb    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

```
show task
  <logical-system (all | logical-system-name)>
  <task-name>
  io
  logical-system-mux
  memory
  replication
  snooping
  summary
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display routing protocol tasks on the Routing Engine.

Options

none—Display all 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.

logical-system-mux— Display the logical router multiplexer process (lrmuxd) per-task information.

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).

io— Show i/o statistics for all tasks displayed.

memory— Show memory statistics for all tasks displayed.

replication— Show only replication tasks.

snooping— Show only snooping tasks.

summary— (Optional) Display summary information about running tasks.

Required Privilege Level

view

RELATED DOCUMENTATION

show task io 535
show task logical-system-mux 538
show task memory 541

List of Sample Output
[show task on page 533](#)

Output Fields

[Table 23 on page 533](#) describes the output fields for the **show task** command. Output fields are listed in the approximate order in which they appear.

Table 23: 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 535](#)

[Syntax \(EX Series Switches\) on page 535](#)

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 536](#)

Output Fields

[Table 24 on page 535](#) describes the output fields for the **show task io** command. Output fields are listed in the approximate order in which they appear.

Table 24: show task io Output Fields

Field Name	Field Description
Task Name	Name of the task.

Table 24: show task io Output Fields (*continued*)

Field Name	Field Description
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	106	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 logical-system-mux

Syntax

```
show task logical-system-mux <task-name>
  <io>
  <memory>
  <replication>
  <summary>
```

Release Information

Command introduced in Junos OS Release 13.3.

Description

Display the logical router multiplexer process (lrmuxd) per-task information.

Options

none— Display all the logical router multiplexer process (lrmuxd) per-task information.

task-name— (Optional) Display information about running tasks for all tasks whose name begins with this string (for example, **lsys_session_task:lr2** and **lsys_session_task:lr1** are both displayed when you run the **show task logical-system-mux lsys** command).

io— Show I/O statistics for all tasks displayed.

memory— Show memory statistics for all lrmuxd processes displayed.

replication— Show only replication tasks.

summary— Display summary information about running tasks.

Required Privilege Level

view

RELATED DOCUMENTATION

[show task | 532](#)

[show task io | 535](#)

[show task memory | 541](#)

List of Sample Output

[show task logical-system-mux on page 539](#)

[show task logical-system-mux io on page 540](#)

[show task logical-system-mux memory on page 540](#)

Output Fields

Table 25 on page 539 describes the output fields for the **show task logical-system-mux** command. Output fields are listed in the approximate order in which they appear.

Table 25: show task logical-system-mux 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 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 logical-system-mux

user@host> **show task logical-system-mux**

```

Pri Task Name                               Pro  Port So Flags
15 Memory
40 lsys_session_task:lr2                     14 <WriteDisable>
40 lsys_session_task:lr1                     11 <WriteDisable>
40 lrmuxd lsys info task
60 Mirror Task.128.0.0.6                     63793 9 <WriteDisable>
70 MGMT.local                               15 <WriteDisable>
70 MGMT_Listen./var/run/lrmuxd_mgmt          6 <Accept WriteDisable>

```

show task logical-system-mux io

```
user@host> show task logical-system-mux io
```

Task Name	Reads	Writes	Rcvd	Sent	Dropped
Memory	0	0	0	0	0
lsys_session_task:lr2	7	2	0	0	0
lsys_session_task:lrl	7	2	0	0	0
lrmuxd lsys info task	0	0	0	0	0
Mirror Task.128.0.0.6	1940	1	0	0	0
MGMT.local	0	0	1	0	0
MGMT_Listen./var/run/lrmuxd_mg	12	0	12	0	0

show task logical-system-mux memory

```
user@host> show task logical-system-mux memory
```

Memory	Size (kB)	Percentage	When
Currently In Use:	1483	0%	now
Maximum Ever Used:	1483	0%	13/03/20 02:28:18
Available:	1589641	100%	now

show task memory

List of Syntax

[Syntax on page 541](#)

[Syntax \(EX Series Switches\) on page 541](#)

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 544](#)

[show task memory detail on page 544](#)

Output Fields

Table 26 on page 542 describes the output fields for the **show task memory** command. Output fields are listed in the approximate order in which they appear.

Table 26: 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
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

Table 26: show task memory Output Fields (*continued*)

Field Name	Field Description	Level of Output
Overall Memory Report	<p>Memory utilization by memory size:</p> <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	<p>Memory utilization by named objects:</p> <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
Malloc Usage Report	<p>Memory utilization for miscellaneous use:</p> <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

Table 26: show task memory Output Fields (*continued*)

Field Name	Field Description	Level of Output
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

RELATED DOCUMENTATION

Example: Configuring Nonstop Active Routing on Switches

List of Sample Output

[show task replication \(Issued on the Master Routing Engine\) on page 547](#)

[show task replication \(Issued on the Backup Routing Engine\) on page 548](#)

[show task replication \(Junos OS Evolved\) on page 548](#)

Output Fields

[Table 27 on page 547](#) lists the output fields for the **show task replication** command. Output fields are listed in the approximate order in which they appear.

Table 27: show task replication Output Fields

Field Name	Field Description
Stateful replication	Displays whether or not graceful Routing Engine switchover is configured. The status can be Enabled or Disabled .
RE mode	Displays the Routing Engine on which the command is issued: Master , Backup , or Not applicable (when the router has only one Routing Engine).
Protocol	Protocols that are supported by nonstop active routing.
Synchronization Status	<p>Nonstop active routing synchronization status for the supported protocols. States are NotStarted, InProgress, and Complete.</p> <p>Synchronization states are shown for each of the supported protocols that are running on the device at that moment.</p>

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 task replication (Junos OS Evolved)

In Junos OS Evolved, both the master and backup Routings have the same CLI output. If you configured any protocol, you should see the synchronization state for the same.

```
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