

# Junos® OS

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## Overview for Junos OS

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Juniper Networks, Inc.  
1133 Innovation Way  
Sunnyvale, California 94089  
USA  
408-745-2000  
[www.juniper.net](http://www.juniper.net)

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*Junos® OS Overview for Junos OS*

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# About This Guide

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

# 1

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## Understanding Junos OS

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## CHAPTER 1

# Junos OS Software Overview

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## About the Overview for Junos OS

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 configure and use Juniper Networks devices.

In this guide, we cover:

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

- Managing network devices
- Using configuration statements and operational commands

For a basic introduction to Junos OS, see the [Getting Started Guide for Junos OS](#). 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.

For introductory and overview information specific to Junos OS Evolved, see [Introducing Junos OS Evolved](#). This guide will acquaint you with Junos OS Evolved, the next generation Junos OS, and explain its strengths, similarities to, and differences from Junos OS.

To learn how to use the Junos OS command-line interface (CLI) and understand more advanced Junos OS topics, see the [CLI User Guide](#). This guide explains how to use the CLI, enter configuration statements, manage configurations, and enter operational commands for monitoring Junos OS networking devices.

## RELATED DOCUMENTATION

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[CLI User Guide](#)

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[Getting Started Guide for Junos OS](#)

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[Introducing Junos OS Evolved](#)

## Junos OS Overview

Juniper Networks provides high-performance network devices 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
- Concurrent software releases
- 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 cohesive operating system that is supported 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.

### *Concurrent Software Releases*

Each new mainline version of Junos OS is released concurrently for all product lines. Each new Junos OS release includes working features released in previous versions of the software and must achieve zero critical regression errors. Any deprecated features or functions are not only announced, but any needed workarounds or solutions are provided. This discipline ensures reliable operations for the entire release.

### *Modular Software Architecture*

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.

Generally, 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. However, if needed, you can order Juniper Networks devices without any software installed, for additional flexibility.

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](#) website 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 routing process architecture:

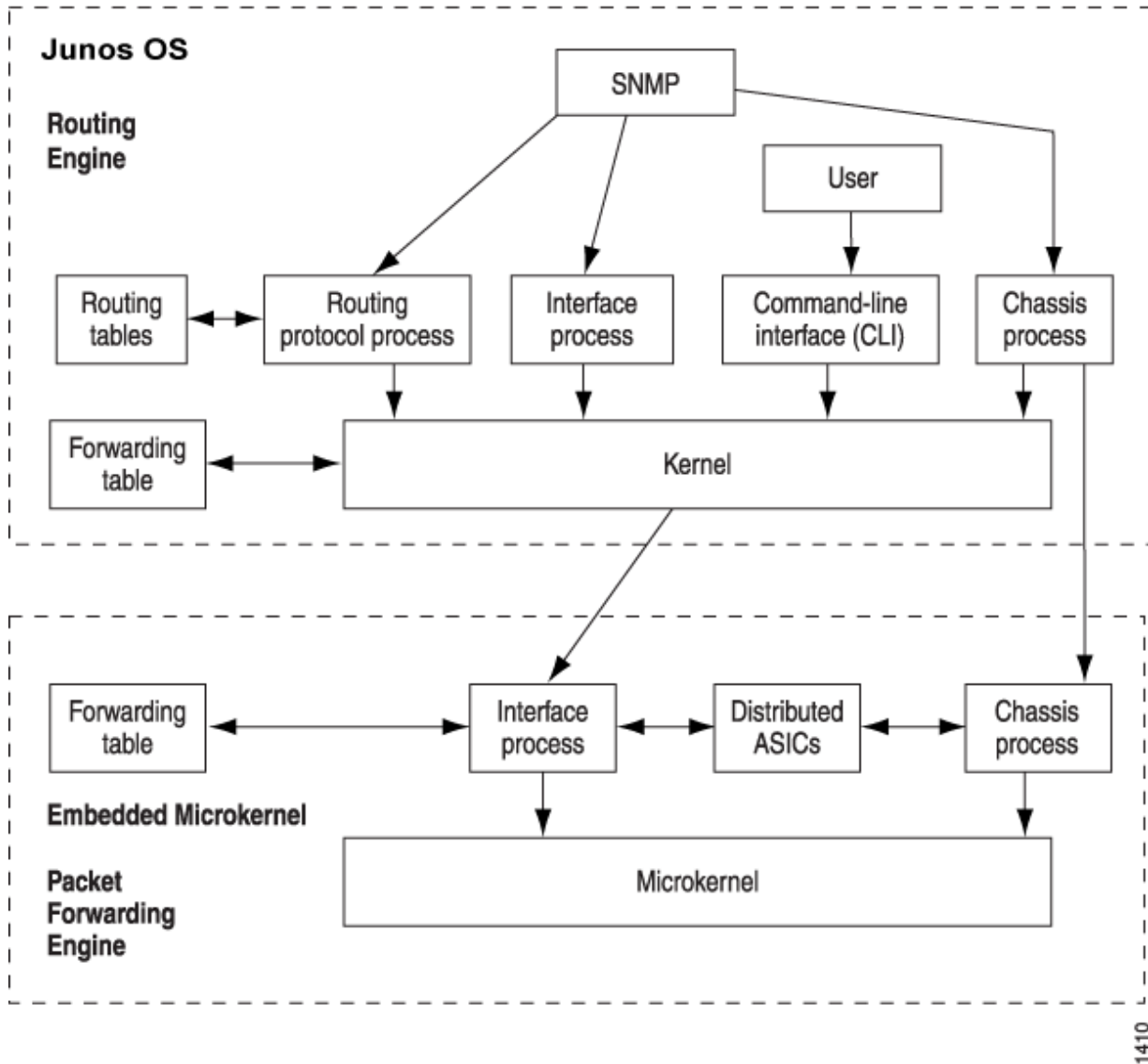
### Routing Process Architecture

The routing process is handled by the following two components (see [Figure 1 on page 6](#)):

- *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.

## 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.

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*.
- 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.

## RELATED DOCUMENTATION



## Router Hardware Components

Junos OS runs on all Juniper Networks devices, including both routers and switches. This section focuses specifically on router hardware components.

Table 1 on page 8 lists the major hardware components in each router series.

**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 1: 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	

Table 1: Major Router Hardware Components (*Continued*)

	M Series	MX Series	T Series	PTX Series	J Series
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.

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## Junos OS Routing Engine Components and Processes

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Junos OS also runs on the *Routing Engine*. Junos OS consists of software processes that support Internet routing *protocols*, control router interfaces and the router chassis, enable router system management, and much more. 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 the processes. Following is a listing of the major Routing Engine-related 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.

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Junos OS Routing 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. This section provides a brief overview of Junos OS routing-specific processes.

As an example, [Table 2 on page 12](#) describes the processes that run on MX Series 5G Universal Routing Platforms.

Table 2: Junos OS Processes on MX Series Platform

Process	Name	Description
Clksync process (RE)	clksyncd	<p>Defines the operation of synchronous Ethernet and Precision Time Protocol (<i>PTP</i>) 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 <i>EEC</i> 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 2: Junos OS Processes on MX Series Platform (*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 ( <i>LAG</i> ).
Statistics agent process	stats-agentd	<p>Acts as a relay process to collect interface statistics for all software development kit (<i>SDK</i>) applications.</p> <p>Interacts with the pfed process to collect the logical interface statistics for SDK applications.</p>

Table 3 on page 13 lists other processes that are common across Junos OS routing platforms.

Table 3: Junos OS Routing-Specific Processes

Process	Name	Description
Adaptive services process	adaptive-services	Manages the configuration for <i>stateful firewall</i> , Network Address Translation ( <i>NAT</i> ), intrusion detection service ( <i>IDS</i> ), and IP Security ( <i>IPsec</i> ) services on the Adaptive Services <i>PIC</i> .
Alarm control process	alarm-control	Configures the system alarm.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
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.
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 Internet 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.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
Ethernet <i>OAM</i> 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 <i>CoS</i> configuration.
Ethernet clock synchronization process	clksyncd-service	Uses Synchronous Ethernet ( <i>SyncE</i> ) for external clock synchronization .
Craft interface <i>I/O</i> 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 primary to the client in the database management system.
Datapath trace process	datapath-trace-service	Traces the path taken by the packet through the network.
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.



Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
Diameter process	diameter-service	Implements the Diameter protocol which uses the Transmission Control Protocol ( <i>TCP</i> ) and Stream Control Transmission Protocol ( <i>SCTP</i> ) instead of User Datagram Protocol ( <i>UDP</i> ), for monitoring the network.
Disk monitoring process	disk-monitoring	Checks the health of the hard drive on the Routing Engine.
Dynamic flow capture ( <i>DFC</i> ) process	dynamic-flow-capture	Controls the DFC configurations on Monitoring Services III PICs.
<i>ECC</i> parity errors logging process	ecc-error-logging	Logs the ECC parity errors into the memory on the Routing Engine.
Connectivity fault management ( <i>CFM</i> ) process	ethernet-connectivity-fault-management	Provides IEEE 802.1ag OAM CFM database information for CFM maintenance association end points ( <i>MEPs</i> ) in a CFM session.
Ethernet <i>OAM</i> Link-Fault-Management process	ethernet-link-fault-management	(EX Series switches and MX Series routers only) Provides the OAM link fault management ( <i>LFM</i> ) information for Ethernet interfaces.
Event processing process	event-processing or eventd	Configures the application to handle all generated events.
<i>Firewall</i> process	firewall	Manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a device.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
General authentication process	general-authentication-service	(EX Series switches and MX Series routers only) Manages general authentication of a user.
Inter-Chassis Communication Protocol ( <i>ICCP</i> ) process	iccp-service	Synchronizes data within a set of two (or more) <i>PEs</i> that form a redundancy group ( <i>RG</i> ).
<i>IDP</i> 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 ( <i>ATM</i> ) interfaces across a physical connection.
Inet process	inet-process	Configures the IP multicast family.
Init process	init	Initializes the <i>USB</i> 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 ( <i>GRES</i> ) is configured.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
Layer 2 address flooding and learning process	l2-learning	<p>Enables a network device to:</p> <ul style="list-style-type: none"> <li>• Learn unicast media access control (<i>MAC</i>) addresses to avoid flooding the packets to all the ports in a bridge domain.</li> <li>• 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.</li> </ul>
Layer 2 Control Protocol process	l2cpd-service	Enables features such as Layer 2 protocol tunneling and nonstop bridging.
Link Aggregation Control Protocol process	lacp	<p>The process:</p> <ul style="list-style-type: none"> <li>• Provides a standardized means for exchanging information between partner systems on a link.</li> <li>• Allows the link aggregation control instances to reach agreement on the identity of the Link Aggregation Group (<i>LAG</i>) to which the link belongs, and then to move the link to that LAG.</li> <li>• Enables the transmission and reception processes for the link to function in an orderly manner.</li> </ul>
Link management process	link-management	Manages traffic engineering links.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
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 <i>multiplexer</i> process	logical-system-mux or Irmuxd	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 <i>MIB</i> II agent.
Mobile IP process	mobile-ip	Configures Junos OS Mobile IP features.
<i>NFS</i> 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 ( <i>FECs</i> ) for <i>LDPL</i> ayered Service Providers ( <i>LSPs</i> ).
Multiservice process	mspd	Configures multiservice edge routers.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
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 <i>VLAN</i> switches.
<i>DNS</i> 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 <i>NFS</i> 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.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
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 ( <i>PGCP</i> ) that is required for the border gateway function ( <i>BGF</i> ) feature.
Pragmatic General Multicast process	pgm	Enables a reliable transport layer for multicast applications.
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 ( <i>PPP</i> ) 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.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
Process health monitor process	process-monitor or pmond	<p>Extends the SNMP <i>RMON</i> 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><b>NOTE:</b> 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 <code>disable</code> statement at the <code>[edit system processes process-monitor]</code> 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 <i>ping</i> and <i>traceroute</i> 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.
Traffic sampling control process	sampling	Performs packet sampling based on particular input interfaces and various fields in the packet header.

Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
Session Border Control ( <i>SBC</i> ) 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.
<i>SDK</i> 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 ( <i>SND</i> ) protocol process	secure-neighbor-discovery or send	(EX Series switches and MX Series routers only) Provides support for protecting <i>NDP</i> messages.
Service Deployment System ( <i>SDX</i> ) process	service-deployment	Enables Junos OS to work with the Session and Resource Control ( <i>SRC</i> ) software.
Simple Network Management Protocol (SNMP) process	snmp	Enables the monitoring of network devices from a central location, and provides the device's SNMP primary agent.
<i>SONET</i> Automatic Protection Switching (APS) process	sonet-aps	Monitors any SONET interface that participates in <i>APS</i> .



Table 3: Junos OS Routing-Specific Processes (*Continued*)

Process	Name	Description
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.
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

### IN THIS SECTION

- [Directories on the Logical System | 25](#)

Generally, 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

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

## Junos OS Support for IPv4, IPv6, and MPLS Routing Protocols

Junos OS implements full IP routing functionality, providing support for IP version 4 and IP version 6 (IPv4 and IPv6, respectively). 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 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 OS 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**—Open Shortest Path First 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.

OSPF Version 2 supports IPv4. OSPF Version 3 supports IPv6. The fundamental mechanisms of OSPF such as flooding, designated router (*DR*) election, area-based topologies, and the *SPF*

calculations remain unchanged in OSPF Version 3. 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.

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

- *Unicast* routing protocols:
  - BGP
  - ICMP
  - IS-IS
  - OSPF Version 2
  - RIP Version 2
- 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 are 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 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 RSVP is to support dynamic signaling for MPLS LSPs.

## RELATED DOCUMENTATION

[Junos OS Overview](#)

## 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.

## RELATED DOCUMENTATION

[Routing Policy Overview](#) | 29

## 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.

## RELATED DOCUMENTATION

[Junos OS Routing and Forwarding Tables | 28](#)

[Junos OS Support for IPv4, IPv6, and MPLS Routing Protocols | 26](#)

## Junos OS Support for VPNs

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

- 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.
- An Ethernet VPN (EVPN) enables you to connect dispersed customer sites using a Layer 2 virtual bridge. As with other types of VPNs, an EVPN consists of customer edge (CE) devices (host, router, or switch) connected to provider edge (PE) routers. The PE routers can include an MPLS edge switch (MES) that acts at the edge of the MPLS infrastructure. Either an MX Series 5G Universal Routing Platform or a standalone switch can be configured to act as an MES. You can deploy multiple EVPNs within a service provider network, each providing network connectivity to a customer while ensuring that the traffic sharing on that network remains private.
- 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.

## RELATED DOCUMENTATION

[Junos OS Overview | 3](#)

## Configuring FIB Localization

### IN THIS SECTION

- [FIB Localization Overview | 31](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization | 32](#)

### 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 specific Junos OS devices, including the T320, T640, T1600, and MX Series routers. To see if your hardware supports FIB localization, see the [Juniper Networks Feature Explorer](#).

**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

### IN THIS SECTION

- [Requirements | 32](#)
- [Overview | 33](#)
- [Configuration | 33](#)
- [Verification | 36](#)

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

### IN THIS SECTION

- [Procedure](#) | 33

## Procedure

### 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 [Junos OS 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 | 36](#)
- [Verifying FIB-Localization Configuration | 37](#)
- [Verifying Routes After the Policy Is Applied | 38](#)

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 | 103](#)

[fib-remote | 105](#)

[no-route-localize | 120](#)





## CHAPTER 2

# Junos OS Security Overview

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- Junos OS Default Settings for Device Security | 45

## Junos OS Features for Device Security

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- Methods of Remote Access for Device Management | 41
- Junos OS Supported Protocols and Methods for User Authentication | 41
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Device security consists of three major elements: Physical security of the hardware, operating system security, and security that can be affected through configuration.

Physical security involves restricting access to the device. Exploits that can easily be prevented from remote locations are extremely difficult or impossible to prevent if an attacker can gain access to the device'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 device to minimize vulnerabilities.

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

## Methods of Remote Access for Device Management

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

- **Out-of-band management:** Enables connection to the device through an interface dedicated to device management. Juniper Networks devices support out-of-band management with a dedicated management Ethernet interface, as well as EIA-232 console and auxiliary ports. On all devices other than the TX Matrix Plus, T1600, T1600 or T4000 devices connected to a TX Matrix Plus device in a routing matrix, and PTX Series Packet Transport Routers, the management interface is fxp0. On a TX Matrix Plus, T1600, T1600 or T4000 devices in a routing matrix, 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 device.
- **Inband management:** Enables connection to the devices 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 device.
  - The links between device components might not be totally trustworthy, leading to the possibility of wiretapping and replay attacks.

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

## Junos OS Supported Protocols and Methods for User Authentication

On a device, you can create local user login accounts to control who can log in to the device 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 device.

The management of multiple devices 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 device administrator).

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

- 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 device. 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 device is to forward user traffic toward its intended destination based on the information in the device'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 device with the intent of changing or corrupting the contents of its routing table or other databases, which can degrade the functionality of the device. To prevent such attacks, you must ensure that devices 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 device to a network destination and packets destined for and sent by the device. 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 device from excessive traffic. Firewall filters that control local packets can also protect your device from external aggressions, such as DoS attacks.

To protect the Routing Engine, you can configure a *firewall filter* only on the device's loopback interface. Adding or modifying filters for each interface on the device 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 device's control plane. This results in an excessive processing load that disrupts normal network operations.

Junos OS DDoS protection enables the device 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 device, 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 device 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 device configurations. You can also use the logs when reacting to a continued and deliberate attack as a means of identifying the source address, device, 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 devices 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 device to synchronize the system clocks of devices 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 Device Security

Junos OS protects against common network device 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.
- Generally, by default, only console access to the device is enabled. Remote management access to the device and all management access protocols, including Telnet, FTP, and SSH (Secure Shell), are disabled by default, unless the device setup specifically includes a factory-installed DHCP configuration.
- 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

## IN THIS CHAPTER

- [Junos OS Configuration Basics | 46](#)
- [Methods for Configuring Junos OS | 47](#)
- [Junos OS Configuration from External Devices | 50](#)
- [Understanding the Commit Model for Configurations | 51](#)
- [Understanding Configuration Groups | 52](#)

## Junos OS Configuration Basics

Usually, your Juniper Networks device comes with Junos OS installed on it, unless you specifically order it without the operating system. When Junos OS is pre-installed, you simply power on the device and all software starts automatically. You just need to configure the device so it 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

- [Junos OS Configuration from External Devices | 50](#)
- [Methods for Configuring Junos OS | 47](#)
- [Initial Router or Switch Configuration Using Junos OS | 56](#)

# Methods for Configuring Junos OS

IN THIS SECTION

- [Junos OS Command-Line Interface | 48](#)
- [ASCII File | 48](#)
- [J-Web Package | 49](#)
- [Junos XML Management Protocol Software | 49](#)
- [NETCONF XML Management Protocol Software | 49](#)
- [Configuration Commit Scripts | 50](#)

Depending on specific device support, you can use the methods shown in [Table 4 on page 47](#) to configure Junos OS. For more information, see the [Juniper Networks Feature Explorer](#).

**Table 4: 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 supported on only certain Juniper Networks devices. For more information, see the <a href="#">Juniper Networks Feature Explorer</a> .



**Table 4: Methods for Configuring Junos OS (Continued)**

Method	Description
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 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 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).

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 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.

## 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 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 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](#)[Junos OS Automation Scripting User Guide](#)[Junos OS Configuration from External Devices | 50](#)[NETCONF XML Management Protocol Developer Guide](#)[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 | 47](#)

[Configuring Junos OS to Set Console and Auxiliary Port Properties | 76](#)

## Understanding the 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 current 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. (The remaining rollback files, 4 through 49, are located in **/var/db/config**.)

If the recovery configuration 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.

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.

## RELATED DOCUMENTATION

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

## Understanding Configuration Groups

### IN THIS SECTION

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

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

### Configuration Groups Overview

Configuration groups enable 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 Juniper Networks devices. 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.

For areas of your configuration to inherit configuration statements:

1. Configure statements into a configuration group. To configure configuration groups and inheritance, you can include the groups statement at the [edit] hierarchy level:

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

2. Apply that group to the levels in the configuration hierarchy that require the statements.

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

# 2

PART

## Configuring and Administering Junos Devices

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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 through the console port.

When you first connect to the console of a device that has not yet been configured, log in as the user root. At first, the root account requires no password. You can 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 should 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

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[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 57](#)

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[Supported Routing Engines by Router](#)

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[Junos OS Configuration Using the CLI](#)

## 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 and no base configuration, follow these steps:

1. Connect to the device through the console port.
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. 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: retry 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
```

8. 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.

9. 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
```

10. Configure the IP address of a backup or default network device. 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 primary Routing Engine.)

**NOTE:** The backup Routing Engine does not support more than 16 backup routing 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
```

11. 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
```

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@hostname#.

A basic configuration for Junos OS is 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.

After you have 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 easily return to the previous configuration, because the running copy and the backup copies are identical.

## RELATED DOCUMENTATION

[Initial Router or Switch Configuration Using Junos OS | 56](#)

[Supported Routing Engines by Router](#)

[Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements | 69](#)

[Default Directories for Junos OS File Storage on the Network Device | 24](#)

[Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive | 72](#)

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

If a device 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 apply the configuration to the device.

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 device with dual Routing Engines that have no base configuration, 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 57 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
```



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
```

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. Use the apply-groups statement to apply the configuration to the device.

```
[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. 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: retry 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
```

## 2. Configure the IP address of the DNS server.

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

## 3. Configure the router domain name:

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

4. 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 primary Routing Engine.)

**NOTE:** The backup router Routing Engine does not support more than 16 backup 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
```

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 are satisfied that the configuration is successfully running, issue the `request system snapshot` command to back up the new configuration on both primary 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 configuration, because the running copy and backup copy are identical.

For information about creating configuration groups, see [Junos OS CLI User Guide](#).

For information about configuring high availability features for redundant Routing Engine systems and the `re0` group, see [Junos OS High Availability User Guide](#).

## RELATED DOCUMENTATION

[Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive | 72](#)

[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 57](#)

[Default Directories for Junos OS File Storage on the Network Device | 24](#)

[Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements | 69](#)

[Initial Router or Switch Configuration Using Junos OS | 56](#)

[Supported Routing Engines by Router](#)

## 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.

## 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*

## 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 as *destination-prefix/prefix-length*. Specifically, 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.

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.
- *filename* or *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/%2F path/ 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

[Default Directories for Junos OS File Storage on the Network Device | 24](#)

[Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements | 69](#)

## 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 device.
- 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 device'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

*Configuring a Device's Unique Identity for the Network*

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

## 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.

**NOTE:** This feature is not supported in Junos OS Release 20.1.

## RELATED DOCUMENTATION

[Configuring Junos OS for the First Time on a Device with a Single Routing Engine | 57](#)

[Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card | 73](#)

## 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, with an additional 46 older versions stored on the hard drive. 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 (4 through 49) 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](#) | 72

## Backing Up Configurations to an Archive Site

### IN THIS SECTION

- [Configuring the Transfer of the Currently Active Configuration](#) | 74

You can configure a device to transfer its configuration to an archive file periodically.

### Configuring the Transfer of the Currently Active Configuration

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;
```

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.

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 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`"

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;  
}
```

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 in Coordinated Universal Time (UTC).

**NOTE:** When you configure file archival by using the `archive-sites` statement, the transfer file utility does not work if you have enabled the management instance.

## Configuring Junos OS to Set Console and Auxiliary Port Properties

Most Juniper Networks devices have 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 set to 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.

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](#) | 47

# Monitoring Junos Devices

## IN THIS CHAPTER

- [Junos OS Tools for Monitoring | 78](#)
- [Tracing and Logging Junos OS Operations | 79](#)
- [Understanding Dropped Packets and Untransmitted Traffic Using show Commands | 81](#)
- [Log a User Out of the Device | 85](#)

## 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

[Junos OS Features for Device Security | 40](#)

[Methods for Configuring Junos OS | 47](#)

## 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.

### *Remote Tracing*

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

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.

### *Logging Operations*



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 for Routing Devices](#).

### *Tracing Operations*

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 protocols]` 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](#).

## RELATED DOCUMENTATION

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[Junos OS Network Interfaces Library for Routing Devices](#)

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[Junos OS Routing Protocols Library for Routing Devices](#)

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*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.

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

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.

<b>Errors</b>	Sum of the incoming frame terminates and FCS errors.
<b>Drops</b>	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.
<b>Framing errors</b>	Number of packets received with an invalid frame checksum (FCS).
<b>Runts</b>	Number of frames received that are smaller than the runt threshold.
<b>Policed discards</b>	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.
<b>L3 incompletes</b>	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 <code>ignore-l3-incompletes</code> statement.

<b>L2 channel errors</b>	Number of times the software did not find a valid logical interface for an incoming frame.
<b>L2 mismatch timeouts</b>	Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.
<b>FIFO errors</b>	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.
<b>Resource errors</b>	Sum of transmit drops.
<b>Carrier transitions</b>	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.
<b>Errors</b>	Sum of the outgoing frame terminates and FCS errors.
<b>Drops</b>	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.
<b>Collisions</b>	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.
<b>Aged packets</b>	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.
<b>FIFO errors</b>	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.
<b>HS link CRC errors</b>	Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.
<b>MTU errors</b>	Number of packets whose size exceeded the MTU of the interface.
<b>Resource errors</b>	Sum of transmit drops.
<b>Queued packets</b>	Number of queued packets.
<b>Transmitted packets</b>	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:

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

<b>Timeout</b>	Number of packets discarded because of timeouts.
<b>Truncated key</b>	Number of packets discarded because of truncated keys.
<b>Bits to test</b>	Number of bits to test.
<b>Data error</b>	Number of packets discarded because of data errors.
<b>Stack underflow</b>	Number of packets discarded because of stack underflows.
<b>Normal discard</b>	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.
<b>Extended discard</b>	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.
<b>Invalid interface</b>	Number of packets discarded because of invalid incoming interfaces.
<b>Info cell drops</b>	Number of information cell drops.
<b>Fabric drops</b>	Number of fabric drops.
<b>Local packets input</b>	Number of incoming packets from the local network.
<b>Local packets output</b>	Number of outgoing packets dispatched to a host in the local network.
<b>Software input high drops</b>	Number of incoming software packets of high-priority, dropped during transmission.
<b>Software input medium drops</b>	Number of incoming software packets of medium-priority, dropped during transmission.
<b>Software input low drops</b>	Number of incoming software packets of low-priority, dropped during transmission.

<b>Software output drops</b>	Number of outgoing software packets that were dropped during transmission.
<b>Hardware input drops</b>	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.

## 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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## 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/* and */var/crash/* directories. 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 | 138](#)

[saved-core-files | 139](#)

*Viewing Core Files from Junos OS Processes*

## 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

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



## 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 | 126](#)

[Configuring Failover to Backup Media If a Junos OS Process Fails | 88](#)

*Viewing Core Files from Junos OS Processes*

## 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, 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. 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.:

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

The value for *process-name* should be one of the valid process names.

## RELATED DOCUMENTATION

[Disabling Junos OS Processes | 88](#)

[Saving Core Files from Junos OS Processes | 86](#)

## 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. 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 *rpd* 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.

# 3

PART

## Configuration Statements and Operational Commands

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## CHAPTER 7

# Configuration Statements

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## backup-router

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### Syntax

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

### Hierarchy Level

```
[edit system]
```

## 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

<b><i>address</i></b>	Address of the default router.
<b><i>destination-destination-address</i></b>	(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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| *Configuring a Backup Router*

## commit (System)

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## 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]
```

## 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 primary 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.



## 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.

## RELATED DOCUMENTATION

*Improving Commit Time When Using Configuration Groups*

*server*

*synchronize*

## compress-configuration-files (System)

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- [Hierarchy Level | 97](#)
- [Description | 97](#)
- [Default | 97](#)
- [Options | 97](#)
- [Required Privilege Level | 97](#)
- [Release Information | 98](#)

## Syntax

```
(compress-configuration-files | no-compress-configuration-files);
```

## Hierarchy Level

```
[edit system]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| *Compressing the Current Configuration File*

## configuration-database

### IN THIS SECTION

- [Syntax | 98](#)
- [Hierarchy Level | 99](#)
- [Description | 99](#)
- [Options | 99](#)
- [Required Privilege Level | 100](#)
- [Release Information | 100](#)

## Syntax

```
configuration-database {  
    ephemeral {  
        allow-commit-synchronize-with-gres;  
        commit-synchronize-model (asynchronous | synchronous);  
        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]

## 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

- |                    |  |
|--------------------|--|
| <b>ephemeral</b>   | Configure settings for the ephemeral configuration database. <code>commit-synchronize-model</code> specifies the commit model used to synchronize ephemeral data to the backup Routing Engine during a commit synchronize operation; <code>instance</code> sets the instance name; <code>allow-commit-synchronize-with-gres</code> 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 <code>ignore-ephemeral-default</code> disables the default instance of the ephemeral configuration database. |
| <b>extend-size</b> | 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.

## Release Information

Statement introduced in Junos OS Release 13.2.

## RELATED DOCUMENTATION

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

## domain-name

### IN THIS SECTION

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- [Hierarchy Level | 101](#)
- [Description | 101](#)
- [Options | 101](#)
- [Required Privilege Level | 102](#)
- [Release Information | 102](#)

### Syntax

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

### Hierarchy Level

```
[edit system]
```

### 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## domain-search

### IN THIS SECTION

- [Syntax | 102](#)
- [Hierarchy Level | 102](#)
- [Description | 103](#)
- [Options | 103](#)
- [Required Privilege Level | 103](#)
- [Release Information | 103](#)

## 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]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## fib-local

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- [Syntax | 104](#)
- [Hierarchy Level | 104](#)
- [Description | 104](#)
- [Required Privilege Level | 104](#)
- [Release Information | 104](#)



## Syntax

```
fib-local;
```

## Hierarchy Level

```
[edit chassis fpc fpc-number route-localization]
```

## Description

Configure the Packet Forwarding Engine on an FPC as FIB-local.

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

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 11.4.

## RELATED DOCUMENTATION

[Example: Configuring Packet Forwarding Engine FIB Localization](#) | 32

## fib-remote

### IN THIS SECTION

- [Syntax | 105](#)
- [Hierarchy Level | 105](#)
- [Description | 105](#)
- [Required Privilege Level | 105](#)
- [Release Information | 105](#)

### Syntax

```
fib-remote;
```

### Hierarchy Level

```
[edit chassis fpc fpc-number route-localization]
```

### Description

Configure the Packet Forwarding Engine on an FPC as FIB-remote.

### Required Privilege Level

interface—To view this statement in the configuration.

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

### Release Information

Statement introduced in Junos OS Release 11.4.

## RELATED DOCUMENTATION

[Example: Configuring Packet Forwarding Engine FIB Localization](#) | 32

## filter

### IN THIS SECTION

- [Syntax](#) | 106
- [Hierarchy Level](#) | 106
- [Description](#) | 106
- [Required Privilege Level](#) | 106
- [Release Information](#) | 107

### Syntax

```
filter;
```

### Hierarchy Level

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

### Description

Enables storing of firewall filters across multiple static RAM (SRAM) segments, resulting in proper utilization of SRAM segments. This feature is useful in routers with small routing tables and large firewall filters. This statement is supported on T Series routers.

### Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement added in Junos OS Release 11.1.

## RELATED DOCUMENTATION

[Allocating More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels](#)

## host-name

### IN THIS SECTION

- [Syntax | 107](#)
- [Hierarchy Level | 107](#)
- [Description | 107](#)
- [Options | 108](#)
- [Required Privilege Level | 108](#)
- [Release Information | 108](#)

## Syntax

```
host-name hostname;
```

## Hierarchy Level

```
[edit system]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

# inet6-backup-router

### IN THIS SECTION

- [Syntax | 108](#)
- [Hierarchy Level | 108](#)
- [Description | 109](#)
- [Options | 109](#)
- [Required Privilege Level | 109](#)
- [Release Information | 109](#)

## Syntax

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

## Hierarchy Level

```
[edit system]
```

## 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

<b>address</b>	Address of the default router.
<b>destination- destination- address</b>	<p>(Optional) Destination address that is reachable through the backup router. You can include this option to achieve network reachability while loading, configuring, and recovering the router or switch, but without the risk of installing a default route in the forwarding table.</p> <ul style="list-style-type: none"> <li>• <b>Default:</b> All hosts (default route) are reachable through the backup router.</li> </ul>

## Required Privilege Level

system—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

## location (System)

### IN THIS SECTION

- [Syntax | 110](#)
- [Hierarchy Level | 110](#)
- [Description | 110](#)
- [Options | 110](#)
- [Required Privilege Level | 111](#)

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]

Description

Configure the system location in various formats.

Options

<b>altitude</b> <i>feet</i>	Number of feet above sea level.
<b>building</b> <i>name</i>	Name of building. The name of the building can be 1 to 28 characters in length. If the string contains spaces, enclose it in quotation marks (" ").
<b>country-code</b> <i>code</i>	Two-letter country code.

<b>floor</b> <i>number</i>	Floor in the building.
<b>hcoord</b> <i>horizontal-coordinate</i>	Bellcore Horizontal Coordinate.
<b>lata</b> <i>transport-area</i>	Local Access Transport Area.
<b>latitude</b> <i>degrees</i>	Latitude in degree format.
<b>longitude</b> <i>degrees</i>	Longitude in degree format.
<b>npa-nxx</b> <i>number</i>	First six digits of the phone number (area code and exchange).
<b>postal-code</b> <i>postal-code</i>	Postal code.
<b>rack</b> <i>number</i>	Rack number.
<b>vcoord</b> <i>vertical-coordinate</i>	Bellcore Vertical Coordinate.

## Required Privilege Level

system—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Specifying the Device Physical Location](#)

## memory-enhanced

### IN THIS SECTION

- [Syntax | 112](#)
- [Hierarchy Level | 112](#)



- [Description | 112](#)
- [Required Privilege Level | 112](#)
- [Release Information | 112](#)

## Syntax

```
memory-enhanced {  
    filter;  
    route;  
    vpn-label;  
}
```

## Hierarchy Level

```
[edit chassis]
```

## Description

Allocate more jtree memory for routing tables and Layer 3 VPNs.

**NOTE:** The `memory-enhanced` statement supports MX Series routers with DPC (I-chip based) line cards only.

The remaining statements are explained separately.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement added in Junos OS Release 10.4.

## RELATED DOCUMENTATION

[Allocating More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels](#)

## management-instance

### IN THIS SECTION

- [Syntax | 113](#)
- [Hierarchy Level | 113](#)
- [Description | 113](#)
- [Options | 114](#)
- [Required Privilege Level | 114](#)
- [Release Information | 114](#)

### Syntax

```
management-instance;
```

### Hierarchy Level

```
[edit system]
```

### Description

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

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 the dedicated

management instance `mgmt_junos`, and it enables an administrative routing table dedicated to management tasks for the network device.

For more information about configuring `management-instance` and the `mgmt_junos` routing instance, see *Management Interface in a Non-Default 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.

## Release Information

Statement introduced in Junos OS Release 17.3R1.

## max-configurations-on-flash

### IN THIS SECTION

- [Syntax | 114](#)
- [Hierarchy Level | 115](#)
- [Description | 115](#)
- [Options | 115](#)
- [Required Privilege Level | 115](#)
- [Release Information | 115](#)

## Syntax

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

## Hierarchy Level

[edit system]

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card](#) | 73

## mirror-flash-on-disk

### IN THIS SECTION

● [Syntax](#) | 116

- [Hierarchy Level | 116](#)
- [Description | 116](#)
- [Options | 116](#)
- [Required Privilege Level | 117](#)
- [Release Information | 117](#)

## Syntax

```
mirror-flash-on-disk;
```

## Hierarchy Level

```
[edit system]
```

## 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.

## 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](#).

## RELATED DOCUMENTATION

| [Configuring Automatic Mirroring of the CompactFlash Card on the Hard Drive](#) | 72

## name-server (System Services)

### IN THIS SECTION

- [Syntax](#) | 118
- [Hierarchy Level](#) | 118
- [Description](#) | 118
- [Options](#) | 118
- [Required Privilege Level](#) | 118
- [Release Information](#) | 119

## 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]
```

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

**NOTE:** The only routing instance supported is `mgmt_junos`. Also, this routing instance command is not supported on SRX Series devices.

## Required Privilege Level

system—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

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

## RELATED DOCUMENTATION

[Configuring a DNS Name Server for Resolving Hostnames into Addresses](#)

## non-subscriber-no-reply

### IN THIS SECTION

- [Syntax | 119](#)
- [Hierarchy Level | 119](#)
- [Description | 120](#)
- [Options | 120](#)
- [Required Privilege Level | 120](#)
- [Release Information | 120](#)

## Syntax

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

## Hierarchy Level

```
[edit system arp]
```



## 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.

## Release Information

Statement introduced in Junos OS Release 13.3R9.

## RELATED DOCUMENTATION

| *autoinstallation*

## no-route-localize

### IN THIS SECTION

- [Syntax | 121](#)
- [Hierarchy Level | 121](#)
- [Description | 121](#)
- [Required Privilege Level | 121](#)
- [Release Information | 121](#)

## Syntax

```
no-route-localize;
```

## Hierarchy Level

```
[edit policy-options policy-statement policy-name term term-name then]
```

## Description

Enforce installation of routes on all FIB-remote Packet Forwarding Engines.

## Required Privilege Level

routing—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 11.4.

## RELATED DOCUMENTATION

[Example: Configuring Packet Forwarding Engine FIB Localization](#) | 32

## pic-console-authentication

### IN THIS SECTION

- [Syntax](#) | 122
- [Hierarchy Level](#) | 122
- [Description](#) | 122

- [Default | 122](#)
- [Options | 122](#)
- [Required Privilege Level | 123](#)
- [Release Information | 123](#)

## Syntax

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

## Hierarchy Level

```
[edit system]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

[Configuring Junos OS to Set Console and Auxiliary Port Properties | 76](#)

*Configuring Password Authentication for Console Access to PICs*

## port (Syslog)

### IN THIS SECTION

- [Syntax | 123](#)
- [Hierarchy Level | 124](#)
- [Description | 124](#)
- [Options | 124](#)
- [Required Privilege Level | 124](#)
- [Release Information | 124](#)

## Syntax

```
port port number;
```

## Hierarchy Level

```
[edit system syslog host hostname | other-routing-engine| scc-master)]
```

## 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.

## Release Information

Statement introduced in Junos OS Release 11.3.

## RELATED DOCUMENTATION

---

*syslog*

*host*

## ports

### IN THIS SECTION

- [Syntax | 125](#)
- [Hierarchy Level | 125](#)
- [Description | 126](#)
- [Options | 126](#)
- [Required Privilege Level | 126](#)
- [Release Information | 126](#)

### 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]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Configuring Junos OS to Set Console and Auxiliary Port Properties](#) | 76

## processes

### IN THIS SECTION

- [Syntax](#) | 127
- [Hierarchy Level](#) | 127
- [Description](#) | 127
- [Default](#) | 127
- [Options](#) | 127
- [Required Privilege Level](#) | 128
- [Release Information](#) | 128

Syntax


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

Hierarchy Level

```
[edit system]
```

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

<b>(enable   disable)</b>	(Optional) Enable or disable a specified process.
<b>failover (alternate-media   other-routing-engine)</b>	(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.
<b>process-name</b>	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.
<b>timeout seconds</b>	(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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Disabling Junos OS Processes](#) | 88

## proxy (System)

### IN THIS SECTION

- [Syntax](#) | 129
- [Hierarchy Level](#) | 129
- [Description](#) | 129
- [Options](#) | 129
- [Required Privilege Level](#) | 129
- [Release Information](#) | 129

## Syntax

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

## Hierarchy Level

```
[edit system]
```

## Description

Configure the proxy server properties for a device.

## Options

<b>server</b>	Configure the server by hostname or IP address.
<b>port</b>	Set the port number for the proxy server ranging from 0 through 65535.
<b>username</b>	Specify the user name configured in the proxy server.
<b>password</b>	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.

## Release Information

Statement introduced in Junos OS Release 11.4.

## RELATED DOCUMENTATION

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

# redundancy-interface-process

## IN THIS SECTION

- [Syntax | 130](#)
- [Hierarchy Level | 130](#)
- [Description | 130](#)
- [Options | 131](#)
- [Required Privilege Level | 131](#)
- [Release Information | 131](#)

## Syntax

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

## Hierarchy Level

```
[edit system processes]
```

## Description

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

## Options

<b>command <i>binary-file-path</i></b>	Path to the binary process.
<b>disable</b>	Disable the redundancy interface management process.
<b>failover</b>	Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
<b>alternate-media</b>	Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
<b>other-routing-engine</b>	Instruct the secondary Routing Engine to take primary role 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.

## Release Information

Statement introduced in Junos OS Release 8.5.

## root-authentication

### IN THIS SECTION

- [Syntax | 132](#)
- [Hierarchy Level | 132](#)
- [Description | 132](#)
- [Options | 132](#)
- [Required Privilege Level | 133](#)
- [Release Information | 133](#)

## Syntax

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

## Hierarchy Level

[edit system]

## Description

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

You can use the `ssh-ecdsa`, `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

<b>encrypted-password</b> <b>"<i>password</i>"</b>	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.
<b>no-public-keys</b>	Disable SSH public key-based authentication.

- ssh-eccdsa *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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

*class (Defining Login Classes)*

*user (Access)*

## route (chassis)

### IN THIS SECTION

- [Syntax | 134](#)
- [Hierarchy Level | 134](#)
- [Description | 134](#)
- [Required Privilege Level | 134](#)
- [Release Information | 134](#)

## Syntax

```
route;
```

## Hierarchy Level

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

## Description

Allocate more jtree memory for routing tables over firewall filters.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement added in Junos OS Release 10.4.

## RELATED DOCUMENTATION

[Allocating More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels](#)

## route-localization

### IN THIS SECTION

- [Syntax | 135](#)
- [Hierarchy Level | 135](#)
- [Description | 135](#)

- [Options | 135](#)
- [Required Privilege Level | 135](#)
- [Release Information | 135](#)

## Syntax

```
route-localization {  
    inet;  
    inet6;  
}
```

## Hierarchy Level

[edit chassis]

## Description

Configure FIB localization for IPv4 and IPv6 routes.

## Options

**inet**                Configure FIB localization for IPv4 routes.

**inet6**             Configure FIB localization for IPv6 routes.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 11.4.



## RELATED DOCUMENTATION

[Example: Configuring Packet Forwarding Engine FIB Localization](#) | 32

## routing (System Processes)

### IN THIS SECTION

- [Syntax](#) | 136
- [Hierarchy Level](#) | 136
- [Description](#) | 136
- [Default](#) | 137
- [Options](#) | 137
- [Required Privilege Level](#) | 137
- [Release Information](#) | 138

### Syntax

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

### Hierarchy Level

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

### 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.

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.

## Release Information

Statement introduced in Junos OS Release 13.3 R4.

## RELATED DOCUMENTATION

[Disabling Junos OS Processes | 88](#)

[processes | 126](#)

## saved-core-context

### IN THIS SECTION

- [Syntax | 138](#)
- [Hierarchy Level | 138](#)
- [Description | 139](#)
- [Options | 139](#)
- [Required Privilege Level | 139](#)
- [Release Information | 139](#)

## Syntax

```
(saved-core-context | no-saved-core-context);
```

## Hierarchy Level

```
[edit system]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Saving Core Files from Junos OS Processes](#) | 86

## saved-core-files

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- [Description](#) | 140
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- Required Privilege Level | 140
- Release Information | 140

## Syntax

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

## Hierarchy Level

```
[edit system]
```

## 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.

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Saving Core Files from Junos OS Processes](#) | 86

## static-host-mapping

### IN THIS SECTION

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- [Hierarchy Level | 141](#)
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- [Default | 142](#)
- [Options | 142](#)
- [Required Privilege Level | 142](#)
- [Release Information | 142](#)

### Syntax

```
static-host-mapping {  
    hostname {  
        alias [ aliases ];  
        inet [ addresses ];  
        inet6 [ addresses];  
        sysid system-identifier;  
    }  
}
```

### Hierarchy Level

```
[edit system]
```

### 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

<b>alias</b> <i>alias</i>	Alias for the hostname.
<b>hostname</b>	Fully qualified hostname.
<b>inet</b> <i>address</i>	IP address. You can specify one or more IP addresses for the host.
<b>sysid</b> <i>system-identifier</i>	ISO system identifier (system ID). This is the 6-byte portion of the Intermediate System-to-Intermediate System (IS-IS) network service access point (NSAP). We recommend that you use the host's IP address represented in binary-coded decimal (BCD) format. For example, the IP address 208.197.169.18 is 2081.9716.9018 in BCD.

## Required Privilege Level

system—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

## vpn-label

### IN THIS SECTION

- [Syntax | 143](#)
- [Hierarchy Level | 143](#)

- [Description | 143](#)
- [Required Privilege Level | 143](#)
- [Release Information | 143](#)

## Syntax

```
vpn-label;
```

## Hierarchy Level

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

## Description

Allocate more jtree memory for Layer 3 VPN labels.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement added in Junos OS Release 10.4.

## RELATED DOCUMENTATION

| [Allocating More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels](#)



## CHAPTER 8

# File Management Commands

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## file archive

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## Syntax

```
file archive destination destination source source
<compress>
```

## 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

## 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.tar`.

```
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
```

### Release Information

Command introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

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

## file checksum md5

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- [Required Privilege Level](#) | 148
- [Output Fields](#) | 148
- [Sample Output](#) | 148
- [Release Information](#) | 148

## Syntax

```
file checksum md5 <pathname> filename
```

## 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

## 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
```

## Release Information

Command introduced before Junos OS Release 7.4.

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

---

[file checksum sha1](#) | [149](#)

## file checksum sha1

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- [Output Fields](#) | [150](#)
- [Sample Output](#) | [150](#)
- [Release Information](#) | [150](#)

### Syntax

```
file checksum sha1 <pathname> filename
```

### 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

## Output Fields

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

## Sample Output

**file checksum sha1**

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

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

## Release Information

Command introduced in Junos OS Release 9.5.

## 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](#) | [147](#)

---

[file checksum sha-256](#) | [151](#)

## file checksum sha-256

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- [Syntax | 151](#)
- [Description | 151](#)
- [Options | 151](#)
- [Required Privilege Level | 151](#)
- [Output Fields | 151](#)
- [Sample Output | 152](#)
- [Release Information | 152](#)

### Syntax

```
file checksum sha-256 <pathname> filename
```

### 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

### 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
```

## Release Information

Command introduced in Junos OS Release 9.5.

## 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](#) | [147](#)

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## file compare

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- [Description](#) | [153](#)
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- [Required Privilege Level](#) | [154](#)
- [Output Fields](#) | [154](#)
- [Sample Output](#) | [154](#)

## Syntax

```
file compare (files filename filename)  
<context | unified>  
<ignore-white-space>
```

## 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

<b>files <i>filename</i></b>	Names of two local files to compare.
<b>context</b>	(Optional) Display output in context format.
<b>ignore-white-space</b>	(Optional) Ignore changes in the amount of white space.
<b>unified</b>	(Optional) Display output in unified format.

## Required Privilege Level

none

## 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
    }
```

## Release Information

Command introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

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

*Viewing Core Files from Junos OS Processes*

## file copy

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- [Syntax | 156](#)
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- [Required Privilege Level | 158](#)
- [Sample Output | 158](#)
- [Release Information | 159](#)

## Syntax

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

## 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

<i>source</i>	Specify the source URL.
<i>destination</i>	Specify the destination URL.
<i>source-address</i> <i>source-address</i>	(Optional) Specify the local address to use in originating the connection.
<i>staging-directory</i> <i>directory-location</i>	(Optional) Specify the staging directory on Routing Engine

## Required Privilege Level

maintenance

## 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 rel:/var/tmp/junos-install-x.log /root/ staging-directory /var/tmp/tmp1
```

## Release Information

Command introduced before Junos OS Release 7.4.

source-address option added in Junos OS Release 7.4.

staging-directory option added in Junos OS Release 17.3R1.

## 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 | 24](#)

## file delete

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- [Output Fields | 160](#)
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- [Release Information | 161](#)



## Syntax

```
file delete filename  
<purge>
```

## 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

## 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
```

## Release Information

Command introduced before Junos OS Release 7.4.

## file list

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- [Additional Information | 162](#)
- [Required Privilege Level | 162](#)
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- [Release Information | 164](#)

## Syntax

```
file list <detail | recursive> <path>
```

## 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

## 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
```

## Release Information

Command introduced before Junos OS Release 7.4.

## file rename

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- [Required Privilege Level | 165](#)
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- [Release Information | 166](#)

## Syntax

```
file rename source destination
```

## 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

## 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
```

## Release Information

Command introduced before Junos OS Release 7.4.

## file show

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- [Options | 167](#)
- [Required Privilege Level | 167](#)
- [Output Fields | 167](#)
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- [Release Information | 169](#)

## Syntax

```
file show filename  
<encoding (base64 | raw)>
```

## Description

Display the contents of a file.

## Options

<b><i>filename</i></b>	Name of a file. For a routing matrix, the file name must include the chassis information.
<b>encoding (base64   raw)</b>	(Optional) Encode file contents with base64 encoding or show raw text.

## Required Privilege Level

maintenance

## 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
```

## Release Information

Command introduced before Junos OS Release 7.4.

# System Software Administrative Commands

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## clear system reboot

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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>
```

### 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

<b>none</b>	Clear all pending system software reboots or halts.
<b>all-chassis</b>	(TX Matrix routers and TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for all the Routing Engines in the chassis.
<b>all-lcc</b>	(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 I connected T1600 or T4000 LCCs.

<b>all-members</b>	(EX4200 switches only) (Optional) Clear all halt or reboot requests on all members of the Virtual Chassis configuration.
<b>both-routing-engines</b>	(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.
<b>infrastructure <i>name</i></b>	(QFabric systems) (Optional) Clear all halt or reboot requests on the fabric control Routing Engines or fabric manager Routing Engines.
<b>interconnect-device <i>name</i></b>	(QFabric systems) (Optional) Clear all halt or reboot requests on the Interconnect device.
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>local</b>	(EX4200 switches only) (Optional) Clear all halt or reboot requests on the local Virtual Chassis member.
<b>member <i>member-id</i></b>	(EX4200 switches only) (Optional) Clear all halt or reboot requests on the specified member of the Virtual Chassis configuration. Replace <i>member-id</i> with a value from 0 through 9.
<b>node-group <i>name</i></b>	(QFabric systems) (Optional) Clear all halt or reboot requests on the Node group.

<b>scc</b>	(TX Matrix routers only) (Optional) Clear all halt or reboot requests for the TX Matrix router (or switch-card chassis).
<b>sfc <i>number</i></b>	(TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for the TX Matrix Plus router. Replace <i>number</i> with 0.

## Required Privilege Level

maintenance

## 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.
```

## 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.

## RELATED DOCUMENTATION

[request system reboot | 208](#)

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## request flight-recorder set high-cpu

### IN THIS SECTION

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## Syntax

```
request flight-recorder set high-cpu  
<disable>
```



```

<backoff-duration seconds>
<collect-core>
<cpu-threshold percentage>
<logical-system>
<num-snapshots number>
<polling-frequency frequency>

```

## 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

<b>none</b>	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 <b>/var/log/flight_recorder/</b> .
<b>disable</b>	Disable flight recorder tool that has been enabled using the <code>request flight-recorder set high-cpu</code> command. <ul style="list-style-type: none"> <li>• <b>Default:</b> Disabled.</li> </ul>
<b>backoff-duration seconds</b>	(Optional) Specify the time interval in seconds between two snapshots of data. <ul style="list-style-type: none"> <li>• <b>Default:</b> 100 seconds.</li> <li>• <b>Range:</b> 10 through 1000.</li> </ul>
<b>collect-core</b>	(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

## 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!
```

## Release Information

Command introduced in Junos OS Release 18.2R1.

## RELATED DOCUMENTATION

| [show flight-recorder status](#) | [278](#)

## request message

### IN THIS SECTION

- [Syntax](#) | [179](#)
- [Description](#) | [179](#)

- Options | 179
- Required Privilege Level | 179
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## Syntax

```
request message all message "text"
request message message "text" (terminal terminal-name | user user-name)
```

## Description

Display a message on the screens of all users who are logged in to the router or switch or on specific screens.

## Options

<b>all</b>	Display a message on the terminal of all users who are currently logged in.
<b>message "text"</b>	Message to display.
<b>terminal <i>terminal-name</i></b>	Name of the terminal on which to display the message.
<b>user <i>user-name</i></b>	Name of the user to whom to direct the message.

## Required Privilege Level

maintenance

## 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 tty0 at 20:27 ...
Maintenance window in 10 minutes
EOF
```

## Release Information

Command introduced before Junos OS Release 7.4.

## request system configuration database resize

### IN THIS SECTION

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- [Options | 181](#)
- [Additional Information | 182](#)
- [Required Privilege Level | 182](#)
- [Output Fields | 182](#)
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## Syntax

```
request system configuration database resize
<force>
<re0 | re1>
<routing-engine backup | master | both | local>
```

## 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

- |                       |   |
|-----------------------|---|
| <b>force</b>          | (Optional) If there are uncommitted changes and you execute the <code>request system configuration database resize</code> 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 <code>force</code> option to discard the uncommitted changes.   |
| <b>re0   re1</b>      | (Optional) If a router has dual Routing Engines, <code>re0</code> and <code>re1</code> identify the specific routing engine that is to execute the <code>request system configuration database resize</code> command. <code>re0</code> is for the Routing Engine in slot 0 and <code>re1</code> is for the Routing Engine in slot 1.  |
| <b>routing-engine</b> | <p>(Optional) To execute the <code>request system configuration database resize</code> command on a specific routing engine, or on both routing engines, in a redundant configuration you can specify one of the following:</p> <ul style="list-style-type: none"> <li>• <code>backup</code>—Resizes the configuration database on the backup routing engine in a redundant configuration.</li> <li>• <code>primary</code>—Resizes the configuration database on the primary routing engine in a redundant configuration.</li> <li>• <code>both</code>—Resizes the configuration database on both routing engines.</li> <li>• <code>local</code>—Resizes the configuration database on the local routing engine.</li> </ul> |

## 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 terminate the command when it is in progress (for example, by specifying **Ctrl+c** or **Ctrl+z**).

## Required Privilege Level

maintenance

## 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

```

## Release Information

Command introduced in Junos OS Release 17.2R1.

## request system halt

### IN THIS SECTION

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- [Syntax \(EX Series Switches\) | 184](#)
- [Syntax \(PTX Series\) | 184](#)
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## 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>
```

## 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.

<b>all-chassis</b>	(TX Matrix and TX Matrix Plus routers only) (Optional) Halt all chassis.
<b>all-lcc</b>	(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.
<b>all-members</b>	(Optional) Halt all members of the Virtual Chassis configuration.
<b>at <i>time</i></b>	<p>(Optional) Time at which to stop the software, specified in one of the following ways:</p> <ul style="list-style-type: none"> <li>• <i>now</i>—Stop the software immediately. This is the default.</li> <li>• <i>+minutes</i>—Number of minutes from now to stop the software.</li> <li>• <i>yymmddhhmm</i>—Absolute time at which to stop the software, specified as year, month, day, hour, and minute.</li> <li>• <i>hh:mm</i>—Absolute time on the current day at which to stop the software.</li> </ul>
<b>backup-routing-engine</b>	(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 primary Routing Engine, the backup Routing Engine is halted. If you issue the command from the backup Routing Engine, the backup Routing Engine is halted.
<b>both-routing-engines</b>	(Optional) Halt both Routing Engines at the same time.
<b>director-device director-device-id</b>	(QFabric systems only) Halt a specific Director device.
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>

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

<b>local</b>	(Optional) Halt the local Virtual Chassis member.
<b>in <i>minutes</i></b>	(Optional) Number of minutes from now to stop the software. This option is an alias for the at + <i>minutes</i> option.
<b>media (compact-flash /disk)</b>	(Optional) Boot medium for the next boot.
<b>media (external   internal)</b>	(EX Series and QFX Series switches and MX Series routers only) (Optional) Halt the boot media: <ul style="list-style-type: none"> <li>• external—Halt the external mass storage device.</li> <li>• internal—Halt the internal flash device.</li> </ul>
<b>member <i>member-id</i></b>	(Optional) Halt the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, <i>member-id</i> can only be 0 or 1.
<b>message "<i>text</i>"</b>	(Optional) Message to display to all system users before stopping the software.
<b>other-routing- engine</b>	(Optional) Halt the other Routing Engine from which the command is issued. For example, if you issue the command from the primary Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the primary Routing Engine is halted.
<b>scc</b>	(TX Matrix routers only) (Optional) Halt the TX Matrix router (or switch-card chassis).
<b>sfc <i>number</i></b>	(TX Matrix Plus routers only) (Optional) Halt the TX Matrix Plus router (or switch-fabric chassis). Replace <i>number</i> with 0.
<b>slice <i>slice</i></b>	(EX Series and QFX Series switches only) (Optional) Halt a partition on the boot media. This option has the following suboptions: <ul style="list-style-type: none"> <li>• 1—Halt partition 1.</li> <li>• 2—Halt partition 2.</li> <li>• alternate—Reboot from the alternate partition.</li> </ul>

## 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 primary Routing Engine, all the primary 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 primary 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

## 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 yymddh120
request system halt at 120
Halt the system at 120? [yes,no] (no) yes
```

## Release Information

Command introduced before Junos OS Release 7.4.

other-routing-engine option introduced in Junos OS Release 8.0.

sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

director-device option introduced for QFabric systems in Junos OS Release 12.2.

backup-routing-engine option introduced in Junos OS Release 13.1.

## RELATED DOCUMENTATION

---

[clear system reboot](#)

---

[request system power-off](#)

[request vmhost halt](#)[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## request system logout

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### Syntax

```
request system logout (pid pid / terminal terminal / user username)  
<all>
```

### 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

- |                       |  |
|-----------------------|--|
| <b>all</b>            | (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.) |
| <b>pid <i>pid</i></b> | Log out the user session using the specified management process identifier (PID). The PID type must be management process.   |



**terminal**                Log out the user for the specified terminal session.  
**terminal**

**user *username***        Log out the specified user.

## Required Privilege Level

configure

## 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.
```

## Release Information

Command introduced before Junos OS Release 7.4.

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## request system partition abort

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## 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>
```

## 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 terminated and the storage media is not affected.

## Options

**all-chassis** (TX Matrix and TX Matrix Plus routers only) (Optional) Terminate a previously scheduled partition operation for all chassis.

**all-lcc** (TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, terminate a previously scheduled partition operation on all T640 routers ( line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, terminate 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) Terminate 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, terminate a previously scheduled partition operation on a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, terminate 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) Terminate a previously scheduled partition operation for the local Virtual Chassis member.

<b>member</b> <i>member-id</i>	(MX Series routers only) (Optional) Terminate a previously scheduled partition operation for the specified member of the Virtual Chassis configuration. Replace <i>member-id</i> with a value of 0 or 1.
<b>scc</b>	(TX Matrix routers only) (Optional) Terminate a previously scheduled partition operation on the TX Matrix router (or switch-card chassis).
<b>sfc number</b>	(TX Matrix Plus routers only) (Optional) Terminate a previously scheduled partition operation on the TX Matrix Plus router (or switch-fabric chassis). Replace <i>number</i> with 0.

## Required Privilege Level

maintenance

## Output Fields

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

## Sample Output

### request system partition terminate

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

## 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](#).

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## request system partition hard-disk

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### 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>
```

## 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

- |                          |  |
|--------------------------|--|
| <b>all-chassis</b>       | (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.  |
| <b>all-lcc</b>           | (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.   |
| <b>all-members</b>       | (MX Series routers only) (Optional) Schedule a partition of the hard disk for all members of the Virtual Chassis configuration.  |
| <b>lcc <i>number</i></b> | (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.

<b>local</b>	(MX Series routers only) (Optional) Schedule a partition of the hard disk for the local member of the Virtual Chassis.
<b>member</b> <i>member-id</i>	(MX Series routers only) (Optional) Schedule a partition of the hard disk for the specified member of the Virtual Chassis configuration. Replace <i>member-id</i> with a value of 0 or 1.
<b>scc</b>	(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).
<b>sfc number</b>	(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 <i>number</i> 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

### 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.
```

## 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](#).

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## request system power-off

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### 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>

```

## 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

<b>none</b>	Power off the router or switch software immediately.
<b>all-chassis</b>	(Optional) (TX Matrix and TX Matrix Plus router only) Power off all Routing Engines in the chassis.
<b>all-lcc</b>	(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.
<b>all-members</b>	(EX4200 switches and MX Series routers only) (Optional) Power off all members of the Virtual Chassis configuration.
<b>at <i>time</i></b>	<p>(Optional) Time at which to power off the software, specified in one of the following ways:</p> <ul style="list-style-type: none"> <li>• <i>now</i>—Power off the software immediately. This is the default.</li> <li>• <i>+minutes</i>—Number of minutes from now to power off the software.</li> <li>• <i>ymmddhhmm</i>—Absolute time at which to power off the software, specified as year, month, day, hour, and minute.</li> <li>• <i>hh:mm</i>—Absolute time on the current day at which to power off the software.</li> </ul>
<b>both-routing-engines</b>	(Optional) Power off both Routing Engines at the same time.
<b>in <i>minutes</i></b>	(Optional) Number of minutes from now to power off the software. This option is an alias for the <i>at +minutes</i> option.
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul>

- 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.

<b>local</b>	(EX4200 switches and MX Series routers only) (Optional) Power off the local Virtual Chassis member.
<b>media (compact- flash   disk)</b>	(Optional) Boot medium for the next boot.
<b>media (external   internal)</b>	<p>(EX Series and QFX Series switches and MX Series routers only) (Optional) Power off the boot media:</p> <ul style="list-style-type: none"> <li>• external—Power off the external mass storage device.</li> <li>• internal—Power off the internal flash device.</li> </ul>
<b>member <i>member-id</i></b>	(EX4200 switches and MX Series routers only) (Optional) Power off the specified member of the Virtual Chassis configuration. For EX4200 switches, replace <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>message "text"</b>	(Optional) Message to display to all system users before powering off the software.
<b>other- routing- engine</b>	(Optional) Power off the other Routing Engine from which the command is issued. For example, if you issue the command from the primary Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the primary Routing Engine is halted.
<b>scc</b>	(Optional) (TX Matrix router only) Power off only the primary Routing Engine or the backup Routing Engine on the TX Matrix router (or switch-card chassis). If you issue the command from the primary Routing Engine, the primary SCC is powered off. If you issue the command from the backup Routing Engine, the backup SCC is powered off.
<b>sfc <i>number</i></b>	(Optional) (TX Matrix Plus router only) Power off only the primary Routing Engine or the backup Routing Engine on the TX Matrix Plus router (or switch-fabric chassis). If you issue the command from the primary Routing Engine, the primary SFC is powered off. If you issue the command from the backup Routing Engine, the backup SFC is powered off. Replace <i>number</i> with zero.
<b>slice <i>slice</i></b>	(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 primary Routing Engine, all the primary 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 primary Routing Engine, all the primary 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

## 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]
```

## Release Information

Command introduced in Junos OS Release 8.0.

## request system process terminate

### IN THIS SECTION

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## Syntax

```
request system process terminate process-id
```

## 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

## 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
```

## Release Information

Command introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

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## request system reboot

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### 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)>
```

## Description

Use this command to reboot the device software.

This command can be used on standalone devices and on devices supported in a Virtual Chassis, Virtual Chassis Fabric, or QFabric system.

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.

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](#).

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.

<b>none</b>	Reboot the software immediately.
<b>all-chassis</b>	(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.
<b>all-lcc</b>	(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.
<b>all-members   local   member member-id</b>	(Optional) Specify which member of the Virtual Chassis to reboot: <ul style="list-style-type: none"> <li>• <b>all-members</b>—Reboots each switch that is a member of the Virtual Chassis.</li> <li>• <b>local</b>—Reboots only the local switch (switch where you are logged in).</li> <li>• <b>member member-id</b>—Reboots the specified member switch of the Virtual Chassis</li> </ul>
<b>at time</b>	(Optional) Time at which to reboot the software, specified in one of the following ways: <ul style="list-style-type: none"> <li>• <b>now</b>—Stop or reboot the software immediately. This is the default.</li> </ul>

- *+minutes*—Number of minutes from now to reboot the software.
- *yymmddhhmm*—Absolute time at which to reboot the software, specified as year, month, day, hour, and minute.
- *hh:mm*—Absolute time on the current day at which to stop the software, specified in 24-hour time.

<b>both-routing-engines</b>	(Optional) Reboot both Routing Engines at the same time.
<b>hypervisor</b>	(Optional) Reboot Junos OS, host OS, and any installed guest VMs.
<b>in <i>minutes</i></b>	(Optional) Number of minutes from now to reboot the software. The minimum value is 1. This option is an alias for the at <i>+minutes</i> option.
<b>in-service</b>	(Optional) Enables you to reset the software state (no software version change) of the system with minimal disruption in data and control traffic.
<b>junos</b>	(Optional) Reboot from the Junos OS (main) volume.
<b>lcc <i>number</i></b>	<p>—(Optional) Line-card chassis (LLC) number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>media (compact-flash   disk   removable- compact-flash   usb)</b>	(Optional) Use the indicated boot medium for the next boot.
<b>media (external   internal)</b>	<p>(Optional) Use the indicated boot medium for the next boot:</p> <ul style="list-style-type: none"> <li>• <b>external</b>—Reboot the device using a software package stored on an external boot source, such as a USB flash drive.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>internal</b>—Reboot the device using a software package stored in an internal memory source.</li> </ul>
<b>message "text"</b>	(Optional) Message to display to all system users before stopping or rebooting the software.
<b>network</b>	(Optional) Reboot using the Preboot Execution Environment (PXE) boot method over the network.
<b>oam</b>	(Optional) Reboot from the maintenance volume (OAM volume, usually the compact flash drive).
<b>other-routing-engine</b>	(Optional) Reboot the other Routing Engine from which the command is issued. For example, if you issue the command from the primary Routing Engine, the backup Routing Engine is rebooted. Similarly, if you issue the command from the backup Routing Engine, the primary Routing Engine is rebooted.
<b>partition partition</b>	<p>(Optional) Reboot using the specified partition on the boot media. This option is equivalent to the <code>slice</code> option that is supported on some devices. Specify one of the following <i>partition</i> values:</p> <ul style="list-style-type: none"> <li>• <b>1</b>—Reboot from partition 1.</li> <li>• <b>2</b>—Reboot from partition 2.</li> <li>• <b>alternate</b>—Reboot from the alternate partition.</li> </ul>
<b>scc</b>	(Optional) Reboot the Routing Engine on the TX Matrix switch-card chassis. If you issue the command from <code>re0</code> , <code>re0</code> is rebooted. If you issue the command from <code>re1</code> , <code>re1</code> is rebooted.
<b>sfc number</b>	(Optional) Reboot the Routing Engine on the TX Matrix Plus switch-fabric chassis. If you issue the command from <code>re0</code> , <code>re0</code> is rebooted. If you issue the command from <code>re1</code> , <code>re1</code> is rebooted. Replace <i>number</i> with 0.
<b>slice slice</b>	<p>(Optional) Reboot using the specified partition on the boot media. This option was originally the <code>partition</code> option but was renamed to <code>slice</code> on EX Series and QFX Series switches. Specify one of the following <i>slice</i> values:</p> <ul style="list-style-type: none"> <li>• <b>1</b>—Reboot from partition 1.</li> <li>• <b>2</b>—Reboot from partition 2.</li> <li>• <b>alternate</b>—Reboot from the alternate partition (which did not boot the switch at the last bootup).</li> </ul>

**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" on page 283](#)). 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 primary Routing Engine, all the primary 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 primary Routing Engine for all routers in the routing matrix are in the same slot number. If the primary Routing Engine for a line-card chassis is in a different slot number than the primary 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 primary Routing Engine.

## Required Privilege Level

maintenance

## 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] yes
[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
```

## Release Information

Command introduced before Junos OS Release 7.4.

Option other-routing-engine introduced in Junos OS Release 8.0.

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.

Option both-routing-engines introduced in Junos OS Release 12.1.

## RELATED DOCUMENTATION

[clear system reboot](#)

[request system halt](#) | **183**

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

[request vmhost reboot](#)

## request system snapshot (Junos OS)

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## 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>
```

## 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.

- 

System snapshot is not supported on QFX10000 and QFX5110-48s-4c switches.

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.



**CAUTION:** After you run the `request system snapshot` command, you cannot return to the previous version of the software, because the running and backup copies of the software are identical.

## Options

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 |** (TX Matrix and TX Matrix Plus router only) (Optional)  
**all-lcc | lcc**  
**number**

- **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 |** (EX Series Virtual Chassis, MX Series routers, QFX Series switches, QFabric System, and  
**local |** OCX1100 only) (Optional) Specify where to place the snapshot (archive data and  
**member** executable areas) in a Virtual Chassis:  
**member-id**

- **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.

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, and MX Series routers) (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, and, except for MX104, MX Series routers) 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.



<b>re0   re1   routing- engine routing- engine-id</b>	<p>(EX6200 and EX8200 switches only) Specify where to place the snapshot in a redundant Routing Engine configuration.</p> <ul style="list-style-type: none"> <li>• re0—Create a snapshot on Routing Engine 0.</li> <li>• re1—Create a snapshot on Routing Engine 1.</li> <li>• routing-engine <i>routing-engine-id</i>—Create a snapshot on the specified Routing Engine.</li> </ul>
<b>root- partition</b>	<p>(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 <b>/altroot</b> on the hard disk device or an <b>/altroot</b> on a USB device. Option deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.</p> <p>To determine which platforms run Junos OS with Upgraded FreeBSD, see the information in <a href="#">Release Information for Junos OS with Upgraded FreeBSD</a>.</p>
<b>slice alternate</b>	<p>(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.</p> <p>Option deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.</p> <p>To determine which platforms support Junos OS with upgraded FreeBSD, see <a href="#">Feature Explorer</a> and enter one of the following:</p> <ul style="list-style-type: none"> <li>• For non-virtualized, enter <b>freebsd</b> and select <b>Junos kernel upgrade to FreeBSD 10+</b>.</li> <li>• For virtualized, enter <b>virtualization</b> and select <b>Virtualization of the Routing Engine</b>.</li> </ul>
<b>scc</b>	<p>(TX Matrix router only) (Optional) Archive data and executable areas for a TX Matrix router (or switch-card chassis).</p>
<b>sfc <i>number</i></b>	<p>(TX Matrix Plus router only) (Optional) Archive data and executable areas for a TX Matrix Plus router (or switch-fabric chassis). Replace <i>number</i> with 0.</p>

## Additional Information

- (Routers only) Before you upgrade 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 primary Routing Engine, all the primary 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

## Output Fields

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

## Sample Output

### request system snapshot (Routers)

```
user@host> request system snapshot
umount: /altroot: not currently mounted
Copying / to /altroot.. (this may take a few minutes)
umount: /altconfig: not currently mounted
Copying /config to /altconfig.. (this may take a few minutes)

The following filesystems were archived: / /config
```

### request system snapshot (EX Series Switches)

```
user@switch> request system snapshot partition
Clearing current label...
Partitioning external media (/dev/da1) ...
Partitions on snapshot:
```

Partition	Mountpoint	Size	Snapshot argument
s1a	/altroot	179M	none
s2a	/	180M	none
s3d	/var/tmp	361M	none

```

s3e    /var      121M    none
s4d    /config   60M     none
Copying '/dev/da0s1a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s2a' to '/dev/da1s2a' .. (this may take a few minutes)
Copying '/dev/da0s3d' to '/dev/da1s3d' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/da1s3e' .. (this may take a few minutes)
Copying '/dev/da0s4d' to '/dev/da1s4d' .. (this may take a few minutes)
The following filesystems were archived: /altroot / /var/tmp /var /config

```

### request system snapshot partition (EX4600, QFX Series, QFabric System, and OCX1100)

```

user@switch> request system snapshot partition
Clearing current label...
Partitioning external media (da1) ...
Verifying compatibility of destination media partitions...
Running newfs (334MB) on external media / partition ...
Running newfs (404MB) on external media /config partition ...
Running newfs (222MB) on external media /var partition ...
Copying '/dev/da0s2a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/da1s3e' .. (this may take a few minutes)
Copying '/dev/da0s2f' to '/dev/da1s1f' .. (this may take a few minutes)
The following filesystems were archived: / /config /var

```

### request system snapshot (When the Partition Flag Is On)

```

user@host> request system snapshot partition
Performing preliminary partition checks ...
Partitioning ad0 ...
umount: /altroot: not currently mounted
Copying / to /altroot.. (this may take a few minutes)

The following filesystems were archived: / /config

```

### request system snapshot (MX104 Routers When Media Device is Missing)

```

user@host > request system snapshot media usb0
error: usb0 media missing or invalid

```

## request system snapshot (When Mirroring Is Enabled)

```
user@host> request system snapshot
Snapshot is not possible since mirror-flash-on-disk is configured.
```

## request system snapshot all-lcc (Routing Matrix)

```
user@host> request system snapshot all-lcc
lcc0-re0:
-----
Copying '/' to '/altroot' .. (this may take a few minutes)
Copying '/config' to '/altconfig' .. (this may take a few minutes)
The following filesystems were archived: / /config

lcc2-re0:
-----
Copying '/' to '/altroot' .. (this may take a few minutes)
Copying '/config' to '/altconfig' .. (this may take a few minutes)
The following filesystems were archived: / /config
```

## request system snapshot all-members (Virtual Chassis)

```
user@switch> request system snapshot all-members media internal

fpc0:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /

fpc1:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /

fpc2:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

```
fpc3:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /

fpc4:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /

fpc5:
-----
Copying '/dev/da0s2a' to '/dev/da0s1a' .. (this may take a few minutes)
The following filesystems were archived: /
```

## Release Information

Command introduced before Junos OS Release 7.4.

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.

Options <config-partition>, <root-partition>, and <slice> deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1

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**.

## RELATED DOCUMENTATION

*request system snapshot (Junos OS with Upgraded FreeBSD)*

[show system snapshot \(Junos OS\) | 351](#)

*show system auto-snapshot*

## request system software abort

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### Syntax

```
request system software abort in-service-upgrade
```

### Description

Terminate 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

## 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 re1
Checking compatibility with configuration Initializing...
Using jbase-9.0-20080116.2
Verified manifest signed by PackageProduction_9_0_0 Using /var/tmp/jinstall-9.0-20080117.0-
domestic-signed.tgz
Verified jinstall-9.0-20080117.0-domestic.tgz signed by PackageProduction_9_0_0 Using
jinstall-9.0-20080117.0-domestic.tgz
Using jbundle-9.0-20080117.0-domestic.tgz
Checking jbundle requirements on /
Using jbase-9.0-20080117.0.tgz
Verified manifest signed by PackageProduction_9_0_0 Using jkernel-9.0-20080117.0.tgz Verified
manifest signed by PackageProduction_9_0_0 Using jcrypto-9.0-20080117.0.tgz Verified manifest
signed by PackageProduction_9_0_0 Using jpfe-9.0-20080117.0.tgz Using jdocs-9.0-20080117.0.tgz
Verified manifest signed by PackageProduction_9_0_0 Using jroute-9.0-20080117.0.tgz Verified
manifest signed by PackageProduction_9_0_0 Hardware Database regeneration succeeded Validating
against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-9.0-20080117.0-domestic-signed.tgz'
...
Verified jinstall-9.0-20080117.0-domestic.tgz signed by PackageProduction_9_0_0 Adding
jinstall...
Verified manifest signed by PackageProduction_9_0_0
```

```

WARNING:      This package will load JUNOS 9.0-20080117.0 software.
WARNING:      It will save JUNOS configuration files, and SSH keys
WARNING:      (if configured), but erase all other files and information
WARNING:      stored on this machine. It will attempt to preserve dumps
WARNING:      and log files, but this can not be guaranteed. This is the
WARNING:      pre-installation stage and all the software is loaded when
WARNING:      you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in /var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:      A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:      'request system reboot' command when software installation is
WARNING:      complete. To abort the installation, do not reboot your system,
WARNING:      instead use the 'request system software delete jinstall'
WARNING:      command as soon as this operation completes.

Saving package file in
/var/sw/pkg/jinstall-9.0-20080117.0-domestic-signed.tgz ...
Saving state for rollback ...
Backup upgrade done
Rebooting Backup RE

Rebooting re1
error: ISSU Aborted! Backup RE maybe in inconsistent state, Please restore backup RE
ISSU: IDLE

{master}
user@host>

```

## Release Information

Command introduced in JUNOS Release 9.0.

## RELATED DOCUMENTATION

---

*request system software in-service-upgrade*

---

*show chassis in-service-upgrade*

---



## request system software add (Junos OS)

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### 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>

```

## Description

Install a software package or bundle on the device.

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.

When you are upgrading to a different release of Junos OS, you usually use the `validate` option on this command. The `validate` option checks the candidate software against the current configuration of the device to ensure they are compatible. (Validate is the default behavior when the software package being added is a different release.) However, there are circumstances under which you cannot validate the running configuration in this way. One such circumstance is when you are upgrading to Junos OS with upgraded FreeBSD from Junos OS based on FreeBSD 6.1. Another such circumstance is when you are updating between different releases of Junos OS with upgraded FreeBSD, and the newest version of FreeBSD uses system calls that are not available in earlier versions of FreeBSD.

Therefore, you cannot use the `validate` option when upgrading to Junos Release 21.2R1, because this release runs on FreeBSD 12; previous releases with upgraded FreeBSD run either FreeBSD 10 or 11.

If you are upgrading between releases that cannot use direct validation, you need to specify one of the following on the `request system software add operational mode` command when you upgrade:

- The `no-validate` option—this option does not validate the software package against the current configuration. Therefore, the current configuration might fail once you upgrade the system. Choose this option for the first time you upgrade a system to the newer version.
- The `validate-on-host` option—this option validates the software package by comparing it to the running configuration on a remote Junos OS host. Be sure to choose a host that you have already upgraded to the newer version of software.
- The `validate-on-routing-engine` option—(for systems with redundant REs) this option validates the software package by comparing it to the running configuration on a Routing Engine in the same chassis. Use this option when you have already upgraded the other Routing Engine to the newer version.

For information on valid filename and URL formats, see [Format for Specifying Filenames and URLs in Junos OS CLI Commands](#).

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.

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](#).

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.

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.

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**.

- 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***

<b>best-effort-load</b>	(Optional) Activate a partial load and treat parsing errors as warnings instead of errors.
<b>component all</b>	(QFabric systems only) (Optional) Install the software package on all of the QFabric components.
<b>delay-restart</b>	(Optional) Install a software package or bundle, but do not restart software processes.
<b>device-alias <i>alias-name</i></b>	(Junos Fusion only) (Optional) Install the satellite software package onto the specified satellite device using the satellite device's alias name.
<b>force</b>	(Optional) Force the addition of the software package or bundle (ignore warnings).
<b>force-host</b>	(Optional) Force the addition of the host software package or bundle (ignore warnings) on the QFX5100 device.
<b>lcc <i>number</i></b>	(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.

<b>member <i>member-id</i></b>	(MX Series routers only) (Optional) Install a software package on the specified Virtual Chassis member. Replace <i>member-id</i> with a value of 0 or 1.
<b>partition</b>	(QFX3500 switches only) (Optional) Format and repartition the media before installation.
<b>satellite <i>slot-id</i></b>	(Junos Fusion only) (Optional) Install the satellite software package onto the specified satellite device using the satellite devices FPC slot identifier.
<b>scc</b>	(TX Matrix routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix router (or switch-card chassis).
<b>sfc <i>number</i></b>	(TX Matrix Plus routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix Plus router. Replace <i>number</i> with 0.
<b>no-copy</b>	(Optional) Install a software package or bundle, but do not save copies of the package or bundle files.
<b>no-validate</b>	(Optional) When loading a software package or bundle with a different release, suppress the default behavior of the validate option.

To upgrade to Junos OS Release 21.2R1, you cannot use the validate option. Instead, choose one of the following options:

- no-validate
- validate-on-host
- validate-on-routing-engine

Software packages from unidentified providers cannot be loaded. To authorize providers, include the provider-id statement at the [edit system extensions provider] hierarchy level.



<b>re0   re1</b>	(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).
<b>reboot</b>	<p>(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.</p> <p>The reboot command is not needed to install third-party applications on devices running Junos OS Evolved.</p>
<b>set [<i>package-name1package-name2</i>]</b>	<p>(Mixed EX4200 and EX4500 Virtual Chassis, M Series, MX Series, and T Series routers only) (Optional) Install multiple packages at same time:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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 <i>package-name</i> 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.</li> </ul> <p>In each case, <i>installation-package</i> 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.</p> <p>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.</p>
<b>unlink</b>	(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.
<b>upgrade-group [ all   <i>upgrade-group-name</i>]</b>	<p>(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 <i>upgrade-group-name</i>, or for all satellite software upgrade groups in a Junos Fusion when the all keyword is specified.</p> <p>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</p>

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.

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.

To upgrade to Junos OS Release 21.2R1, you cannot use the `validate` option. Instead, choose one of the following options:

- `no-validate`
- `validate-on-host`
- `validate-on-routing-engine`

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.

The `request system snapshot` command is currently not supported on the QFabric system. Also, you cannot add or install multiple packages on a QFabric system.

After you run the `request system snapshot` command, you cannot return to the previous version of the software because the running and backup copies of the software are identical.

If you are upgrading more than one package at the same time, delete the operating system package, `jkernl`, last. Add the operating system package, `jkernl`, first and the routing software package, `jroute`, last. If you are upgrading all packages at once, delete and add them in the following order:

```
user@host> request system software add /var/tmp/jbase
user@host> request system software add /var/tmp/jkernl
user@host> request system software add /var/tmp/jpfe
user@host> request system software add /var/tmp/jdocs
user@host> request system software add /var/tmp/jroute
user@host> request system software add /var/tmp/jcrypto
```

By default, when you issue the `request system software add package-name` command on a TX Matrix primary Routing Engine, all the T640 primary 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 primary Routing Engine, all the T1600 or T4000 primary 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

## 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 no-validate (SRX Series device)**

```
user@host> request system software add /var/tmp/junos-
srxsme-20.4I-20200810_dev_common.0.0833.tgz no-copy no-validate
Formatting alternate root (/dev/ad0s2a)...
/dev/ad0s2a: 600.0MB (1228732 sectors) block size 16384, fragment size 2048
        using 4 cylinder groups of 150.00MB, 9600 blks, 19200 inodes.
super-block backups (for fsck -b #) at:
32, 307232, 614432, 921632
Installing package '/altroot/cf/packages/install-tmp/junos-20.4I-20200810_dev_common.0.0833' ...
Verified junos-boot-srxsme.tgz signed by PackageDevelopmentECP256_2020 method ECDSA256+SHA256
Verified junos-srxsme-domestic signed by PackageDevelopmentECP256_2020 method ECDSA256+SHA256
Verified manifest signed by PackageDevelopmentECP256_2020 method ECDSA256+SHA256

WARNING:      The software that is being installed has limited support.
WARNING:      Run 'file show /etc/notices/unsupported.txt' for details.
```



```

JUNOS 20.4I-20200810_dev_common.0.0833 will become active at next reboot
WARNING: A reboot is required to load this software correctly
WARNING:      Use the 'request system reboot' command
WARNING:      when software installation is complete
Saving state for rollback ...

user@host> request system software add /var/tmp/junos-srxsme-19.4R1.3.tgz no-copy no-validate
WARNING: Package junos-19.4R1.3 version 19.4R1.3 is not compatible with current loader
WARNING: Automatic recovering loader, please wait ...
Upgrading Loader...
#####
Verifying the loader image... OK
WARNING: The new boot firmware will take effect when the system is rebooted.
WARNING: Loader recover finish.
Formatting alternate root (/dev/ad0s1a)...
/dev/ad0s1a: 598.5MB (1225692 sectors) block size 16384, fragment size 2048
      using 4 cylinder groups of 149.62MB, 9576 blks, 19200 inodes.
super-block backups (for fsck -b #) at:
32, 306464, 612896, 919328
Installing package '/altroot/cf/packages/install-tmp/junos-19.4R1.3' ...
Verified junos-boot-srxsme-19.4R1.3.tgz signed by PackageProductionEc_2019 method
ECDSA256+SHA256
Verified junos-srxsme-19.4R1.3-domestic signed by PackageProductionEc_2019 method
ECDSA256+SHA256
Verified junos-boot-srxsme-19.4R1.3.tgz signed by PackageProductionEc_2019 method
ECDSA256+SHA256 V
erified junos-srxsme-19.4R1.3-domestic signed by PackageProductionEc_2019 method ECDSA256+SHA256
JUNOS 19.4R1.3 will become active at next reboot
WARNING: A reboot is required to load this software correctly
WARNING: Use the 'request system reboot' command
WARNING: when software installation is complete Saving state for rollback ...

```

### request system software add (SRX Series device)

```

user@host> request system software add /var/tmp/junos-srxsme-19.4R2.3.tgz
WARNING: Package junos-19.4R2.3 version 19.4R2.3 is not compatible with this system.
WARNING: Please install a package with veloadr support, 20.3 or higher.

```

## Release Information

Command introduced before Junos OS Release 7.4.

`best-effort-load` and `unlink` options added in Junos OS Release 7.4.

`sfc` option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.

`set [package-name1package-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.

On EX Series switches, the `set [package-name1package-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-name1package-name2package-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.

`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.

## RELATED DOCUMENTATION

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

*request system software add (Junos OS Evolved)*

*request system software delete (Junos OS)*

*request system software rollback (Junos OS)*

*request system storage cleanup (Junos OS)*

[Installing Software Packages on QFX Series Devices](#)

[Upgrading Software on a QFabric System](#)

*Managing Satellite Software Upgrade Groups in a Junos Fusion*

[request system software add \(Maintenance\)](#)

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## request system zeroize (Junos OS)

### IN THIS SECTION

- [Syntax | 250](#)
- [Description | 250](#)
- [Options | 251](#)
- [Required Privilege Level | 252](#)
- [Sample Output | 252](#)
- [Release Information | 253](#)

### Syntax

```
request system zeroize  
<media>  
<local>
```

### Description

Use this command to 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 primary 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.

This 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.

If the configuration contains the `commit synchronize` statement at the `[edit system]` hierarchy level, and you issue a `commit` in the primary Routing Engine, the primary 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 primary Routing Engine. When the backup Routing Engine comes up, its configuration will automatically be synchronized with the primary. 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 primary Routing Engine configuration.

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.

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.

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

## 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
...

```

## Release Information

Command introduced before Junos OS Release 9.0.

Option `media` added in Junos OS Release 11.4 for EX Series switches.

Option `local` added in Junos OS Release 14.1.

## RELATED DOCUMENTATION

[request system snapshot \(Junos OS\) | 218](#)

*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](#)

## show chassis hardware

### IN THIS SECTION

- [Syntax | 254](#)
- [Syntax \(EX Series, MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms\) | 255](#)
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## 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>
```

## 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

<b>none</b>	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.
<b>clei-models</b>	(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).
<b>detail</b>	(Optional) Include RAM and disk information in output.
<b>extensive</b>	(Optional) Display ID EEPROM information.
<b>all-members</b>	(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.
<b>interconnect-device <i>name</i></b>	(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>local</b>	(MX Series routers only) (Optional) Display hardware-specific information for the local Virtual Chassis members.

<b>member</b> <i>member-id</i>	(MX Series routers and EX Series switches) (Optional) Display hardware-specific information for the specified member of the Virtual Chassis configuration. Replace <i>member-id</i> variable with a value 0 or 1.
<b>models</b>	(Optional) Display model numbers and part numbers for orderable FRUs and, for components that use ID EEPROM format v2, the CLEI code.
<b>node-device</b> <i>name</i>	(QFabric systems only) (Optional) Display hardware-specific information for the Node device.
<b>satellite</b> [ <i>slot-id slot-id</i>   <i>device-alias alias-name</i> ]	(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.
<b>scc</b>	(TX Matrix router only) (Optional) Display hardware information for the TX Matrix router (switch-card chassis).
<b>sfc</b> <i>number</i>	(TX Matrix Plus router only) (Optional) Display hardware information for the TX Matrix Plus router (switch-fabric chassis). Replace <i>number</i> variable with 0.

## Additional Information

The `show chassis hardware detail` command now displays DIMM information for the following Routing Engines, as shown in [Table 5 on page 258](#).

**Table 5: 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

## Output Fields

[Table 6 on page 259](#) lists the output fields for the `show chassis hardware` command. Output fields are listed in the approximate order in which they appear.

**Table 6: show chassis hardware Output Fields**

Field Name	Field Description	Level of Output
Item	Show information about the device hardware.	All levels
Version	Revision level of the chassis component.	All levels
Part number	Part number of the chassis component.	All levels
Serial number	Serial number of the chassis component. The serial number of the backplane is also the serial number of the router chassis. Use this serial number when you need to contact Juniper Networks Customer Support about the router or switch chassis.	All levels
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

**Table 6: show chassis hardware Output Fields (Continued)**

Field Name	Field Description	Level of Output
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

Table 6: show chassis hardware Output Fields (*Continued*)

Field Name	Field Description	Level of Output
Description	<p>Brief description of the hardware item:</p> <ul style="list-style-type: none"> <li>• Type of power supply.</li> <li>• Type of PIC. If the PIC type is not supported on the current software release, the output states Hardware Not Supported.</li> <li>• Type of FPC: FPC Type 1, FPC Type 2, FPC Type 3, FPC Type 4 , or FPC Type0C192.</li> </ul> <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"> <li>• 2x FE—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM</li> <li>• 4x FE—4-port Fast Ethernet ePIM</li> <li>• 1x GE Copper—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port)</li> <li>• 1x GE SFP—SFP Gigabit Ethernet ePIM (one fiber port)</li> <li>• 2x Serial—Dual-port serial PIM</li> <li>• 2x T1—Dual-port T1 PIM</li> <li>• 2x E1—Dual-port E1 PIM</li> <li>• 2x CT1E1—Dual-port channelized T1/E1 PIM</li> <li>• 1x T3—T3 PIM (one port)</li> <li>• 1x E3—E3 PIM (one port)</li> <li>• 4x BRI S/T—4-port ISDN BRI S/T PIM</li> <li>• 4x BRI U—4-port ISDN BRI U PIM</li> </ul>	All levels

Table 6: show chassis hardware Output Fields (*Continued*)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> <li>• 1x ADSL Annex A—ADSL 2/2+ Annex A PIM (one port, for POTS)</li> <li>• 1x ADSL Annex B—ADSL 2/2+ Annex B PIM (one port, for ISDN)</li> <li>• 2x SHDSL (ATM)—G SHDSL PIM (2-port two-wire module or 1-port four-wire module)</li> <li>• 1x TGM550—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog LINE ports, and two analog TRUNK ports)</li> <li>• 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)</li> <li>• 4x FXS, 4x FX0, TIM514—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog LINE ports and four analog TRUNK ports)</li> <li>• 4x BRI TIM521—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports)</li> <li>• Crypto Accelerator Module—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services</li> <li>• MPC M 16x 10GE—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.)</li> <li>• For hosts, the Routing Engine type.</li> <li>• For small form-factor pluggable transceiver (SFP) modules, the type of fiber: LX, SX, LH, or T.</li> <li>• LCD description for EX Series switches (except EX2200 switches).</li> </ul>	

**Table 6: show chassis hardware Output Fields (Continued)**

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> <li>• MPC2—1-port MPC2 that supports two separate slots for MICs.</li> <li>• 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.</li> <li>• 100GBASE-LR4, pluggable CFP optics</li> <li>• Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy.</li> <li>• Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs).</li> <li>• 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.</li> <li>• LCD description for MX Series routers</li> </ul>	

## Sample Output

### show chassis hardware (MX10008 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			DE538	JNP10008 [MX10008]
Midplane	REV 27	750-054097	ACPD6954	Midplane 8
Routing Engine 0		BUILTIN	BUILTIN	RE X10
Routing Engine 1		BUILTIN	BUILTIN	RE X10 128
CB 0	REV 10	750-079562	CAKF2158	Control Board



CB 1	REV 05	711-065897	CAJG2680	Control Board
FPC 1	REV 04	750-084779	CAKN5706	JNP10K-LC2101
CPU	REV 05	750-073391	CAKJ2864	LC 2101 PMB
PIC 0		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-046565	XXL0BQM	QSFP+-40G-SR4
Xcvr 1	REV 01	740-032986	QB350242	QSFP+-40G-SR4
Xcvr 2	REV 01	740-054053	QE408285	QSFP+-4X10G-SR
Xcvr 3	REV 01	740-046565	QF3300Z9	QSFP+-40G-SR4
PIC 1		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-067442	QJ2200LD	QSFP+-40G-SR4
Xcvr 1	REV 01	740-038153	APF170500382DP	QSFP+-40G-CU3M
Xcvr 2	REV 01	740-067442	QI4302LC	QSFP+-40G-SR4
PIC 2		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-067442	1ACP1335119	QSFP+-40G-SR4
Xcvr 1	REV 01	740-067442	1ACP1313156	QSFP+-40G-SR4
Xcvr 2	REV 01	740-067442	QK050040	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067442	QJ2201BG	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-058734	1ECQ12400CS	QSFP-100GBASE-SR4
Xcvr 1	REV 01	740-046565	QF3300ZX	QSFP+-40G-SR4
Xcvr 2	REV 01	740-061405	1ECQ12510FH	QSFP-100G-SR4-T2
Xcvr 3	REV 01	740-032986	QB491182	QSFP+-40G-SR4
PIC 4		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-067442	QJ2200D5	QSFP+-40G-SR4
Xcvr 1	REV 01	740-054053	XXS0L95	QSFP+-4X10G-SR
PIC 5		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-054053	QE251550	QSFP+-4X10G-SR
Xcvr 1	REV 01	740-054053	XZB01D5	QSFP+-4X10G-SR
Xcvr 3	REV 01	740-046565	QI1402F9	QSFP+-40G-SR4
FPD Board	REV 07	711-054687	ACPF2896	Front Panel Display
PEM 1	REV 02	740-049388	1EDL62102PR	Power Supply AC
PEM 2	REV 02	740-049388	1EDL60300H2	Power Supply AC
PEM 4	REV 02	740-049388	1EDL603003Z	Power Supply AC
PEM 5	REV 01	740-049388	1EDL339001B	Power Supply AC
FTC 0	REV 14	750-050108	ACNW3344	Fan Controller 8
FTC 1	REV 14	750-050108	ACPE3978	Fan Controller 8
Fan Tray 0	REV 09	760-054372	ACNV5507	Fan Tray 8
Fan Tray 1	REV 09	760-054372	ACNV5371	Fan Tray 8
SFB 0	REV 25	750-050058	ACPH6821	Switch Fabric (SIB) 8
SFB 1				
SFB 2	REV 24	750-050058	ACNZ0641	Switch Fabric (SIB) 8

SFB 3	REV 27	750-050058	ACPH9127	Switch Fabric (SIB) 8
SFB 5	REV 24	750-050058	ACNX7396	Switch Fabric (SIB) 8

### show chassis hardware (PTX10008 Router)

```
root@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description	
Chassis			DK404	JNP10008 [PTX10008]	
Midplane	REV 28	750-054097	ACPP2394	Midplane 8	
Routing Engine 0		BUILTIN	BUILTIN	RE-PTX-2X00x4	
Routing Engine 1		BUILTIN	BUILTIN	RE-PTX-2X00x4	
CB 0	REV 04	750-068820	ACPT5303	Control Board	
CB 1	REV 04	750-068820	ACPR1627	Control Board	
FPC 6	REV 13	750-068822	ACPB2753	LC1102 - 12C / 36Q /	
14					4X
CPU		BUILTIN	BUILTIN	FPC CPU	
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/	
144x10					GE
Xcvr 0	REV 01	740-067442	XV304N6	QSFP+-40G-SR4	
Xcvr 1	REV 01	740-067442	XV30A5M	QSFP+-40G-SR4	
Xcvr 2	REV 01	740-067442	XV300HC	QSFP+-40G-SR4	
Xcvr 3	REV 01	740-067443	XU20L17	QSFP+-40G-SR4	
Xcvr 4	REV 01	740-067442	XV303XG	QSFP+-40G-SR4	
Xcvr 5	REV 01	740-067443	XV306QC	QSFP+-40G-SR4	
Xcvr 6	REV 01	740-067442	XV303Y7	QSFP+-40G-SR4	
Xcvr 7	REV 01	740-067443	XX60DMR	QSFP+-40G-SR4	
Xcvr 9	REV 01	740-067443	XX60DNY	QSFP+-40G-SR4	
Xcvr 10	REV 01	740-054053	QF4605WF	QSFP+-4X10G-SR	
Xcvr 13	REV 01	740-058734	1ECQ115007D	QSFP-100GBASE-SR4	
Xcvr 15	REV 01	740-046565	QH06035R	QSFP+-40G-SR4	
Xcvr 16	REV 01	740-046565	QH0602KC	QSFP+-40G-SR4	
Xcvr 17	REV 01	740-046565	QH0507PA	QSFP+-40G-SR4	
Xcvr 18	REV 01	740-046565	QH06035M	QSFP+-40G-SR4	
Xcvr 24	REV 01	740-046565	QH0507QL	QSFP+-40G-SR4	
Xcvr 25	REV 01	740-067443	XV20CWP	QSFP+-40G-SR4	
Xcvr 34	REV 01	740-046565	QH06035U	QSFP+-40G-SR4	
Xcvr 35	REV 01	740-067443	XX60DN9	QSFP+-40G-SR4	
FPC 7	REV 41	750-051357	ACPL3446	LC1101 - 30C / 30Q / 96X	
CPU		BUILTIN	BUILTIN	FPC CPU	
PIC 0		BUILTIN	BUILTIN	30x100GE/30x40GE/96x10GE	

Xcvr 0	REV 01	740-067443	XX60DPC	QSFP+-40G-SR4
Xcvr 1	REV 01	740-054053	QF4605W7	QSFP+-4X10G-SR
Xcvr 2	REV 01	740-067443	XX60DP8	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067442	XV30FYM	QSFP+-40G-SR4
Xcvr 4	REV 01	740-067442	1ACP133406Z	QSFP+-40G-SR4
Xcvr 5	REV 01	740-067443	XX60DP5	QSFP+-40G-SR4
Xcvr 8	REV 01	740-046565	QH060355	QSFP+-40G-SR4
Xcvr 12	REV 01	740-058734	1ECQ115008C	QSFP-100GBASE-SR4
Xcvr 15	REV 01	740-046565	QH0602KG	QSFP+-40G-SR4
Xcvr 16	REV 01	740-046565	QH0602LG	QSFP+-40G-SR4
Xcvr 17	REV 01	740-046565	QH06035S	QSFP+-40G-SR4
Xcvr 18	REV 01	740-046565	QH0602KS	QSFP+-40G-SR4
Xcvr 24	REV 01	740-067443	QI2902DP	QSFP+-40G-SR4
Power Supply 2	REV 02	740-049388	1EDL70200NP	Power Supply AC
Power Supply 3	REV 02	740-049388	1EDL603005C	Power Supply AC
Power Supply 4	REV 02	740-049388	1EDL70200P1	Power Supply AC
Power Supply 5	REV 02	740-049388	1EDL70200B7	Power Supply AC
FTC 0	REV 16	750-050108	ACPK8682	Fan Controller 8
FTC 1	REV 16	750-050108	ACPR9530	Fan Controller 8
Fan Tray 0	REV 10	760-054372	ACPR9509	Fan Tray 8
Fan Tray 1	REV 10	760-054372	ACPV7260	Fan Tray 8
SIB 1	REV 28	750-050058	ACPV6306	Switch Fabric 8
SIB 2	REV 28		ACPR2569	Switch Fabric 8
SIB 3	REV 28	750-05	ACPW7402	Switch Fabric 8
SIB 4	REV 28	750-050058	ACPR2577	Switch Fabric 8
FPD Board	REV 07	711-054687	ACPM4965	Front Panel Display

### show chassis hardware (PTX10016 Router Junos OS Evolved Release)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			DY814	JNP10016 [PTX10016]
Midplane 0	REV 02	750-085608	BCAW3258	Midplane 16
FPM 0	REV 01	711-086964	BCAR0775	Front Panel Display
PSM 0	Rev 03	740-069994	1F269200046	JNP10K 5500W AC/HVDC Power Supply Unit
PSM 1	Rev 03	740-069994	1F269170144	JNP10K 5500W AC/HVDC Power Supply Unit
PSM 2	REV 02	740-049388	1EDL60300C6	JNP10K 5500W AC/HVDC Power Supply Unit
PSM 3	REV 02	740-049388	1EDL603005X	JNP10K 5500W AC/HVDC Power Supply Unit
PSM 4	REV 02	740-049388	1EDL6170275	JNP10K 5500W AC/HVDC Power Supply Unit
PSM 5	REV 02	740-049388	1EDL61701WD	JNP10K 5500W AC/HVDC Power Supply Unit

Routing Engine 0		BUILTIN	BUILTIN	JNP10K-RE1-E	
CB 0	REV 15	750-079562	BCAW3941	Control Board	
Routing Engine 1		BUILTIN	BUILTIN	JNP10K-RE1-E	
CB 1	REV 15	750-079562	BCAW3942	Control Board	
FPC 0	REV 07	750-093524	BCAY8271	JNP10K-LC1201	
CPU	REV 14	710-001726	HM1084	FPC CPU	
FPC 10	REV 07	750-093524	BCAY8277	JNP10K-LC1201CPU	REV 05
710-010169	HZ3219	FPC CPU-Enhanced			
SIB 0	REV 02	750-083426	BCAV7680	SIB-JNP10016	
SIB 1	REV 02	750-083426	BCAV7682	SIB-JNP10016	
SIB 2	REV 02	750-083426	BCAV7681	SIB-JNP10016	
SIB 3	REV 02	750-083426	BCAV7684	SIB-JNP10016	
SIB 4	REV 02	750-083426	BCAV7683	SIB-JNP10016	
SIB 5	REV 02	750-083426	BCAV7685	SIB-JNP10016	
FTC 0	REV 10	750-086270	BCAV0609	Fan Controller 16	
Fan Tray 0	REV 02	750-103311	BCAY1793	Fan Tray 16	
Fan Tray 1	REV 02	750-103311	BCAY1797	Fan Tray 16	

show chassis hardware clei-models (PTX10016 Router)

```
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 (QFX5700 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis		EC819	JNP5700	[QFX5700]
....				
....				
....				
Routing Engine 0		BUILTIN	BUILTIN	JNP5700-RCB
Routing Engine 1		BUILTIN	BUILTIN	JNP5700-RCB
CB 0	REV 15	750-079562	BCAV5526	Control Board
CB 1	REV 15	750-079562	BCAW0403	Control Board

### 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	4XSFP28 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	MXA00NKJ	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  
 Address 0x10: 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  
 Address 0x30: 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

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

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
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       REV 07
Midplane      REV 07   750-021261   BH0208188289   QFX Midplane
CB 0          REV 07   750-021261   BH0208188289   QFXIC08-CB4S
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	000000000000000000000000
PSM 5	REV 0B	740-033727	VG00015	000000000000000000000000
PSM 6	REV 0B	740-033727	VH00097	000000000000000000000000
PSM 7	REV 0C	740-033727	VJ00151	000000000000000000000000
PSM 8	REV 0C	740-033727	VJ00149	000000000000000000000000
PDM 0	REV 0B	740-038109	WA00008	
PDM 1	REV 0B	740-038109	WA00014	
Routing Engine 0	REV 02	740-041821	9009094134	RE-S-1800X4-16G-S
Routing Engine 1	REV 02	740-041821	9009094141	RE-S-1800X4-16G-S
CB 0	REV 08	750-040257	CAAB3491	750-040257
CB 1	REV 08	750-040257	CAAB3489	750-040257
SFB 0	REV 06	711-032385	ZV1828	711-032385
SFB 1	REV 07	711-032385	ZZ2568	711-032385
SFB 2	REV 07	711-032385	ZZ2563	711-032385
SFB 3	REV 07	711-032385	ZZ2564	711-032385
SFB 4	REV 07	711-032385	ZZ2580	711-032385
SFB 5	REV 07	711-032385	ZZ2579	711-0323856
SFB 6	REV 07	711-032385	CAAB4882	711-044170
SFB 7	REV 07	711-032385	CAAB4898	711-044170
FPC 0	REV 33	750-028467	CAAB1919	MPC-3D-16XGE-SFPP
FPC 1	REV 21	750-033205	ZG5027	MX-MPC3-3D

MIC 0	REV 03	750-033307	ZV6299	MIC3-3D-10XGE-SFPP
MIC 1	REV 03	750-033307	ZV6268	MIC3-3D-10XGE-SFPP
FPC 8	REV 22	750-031089	ZT9746	MX-MPC2-3D
MIC 0	REV 26	750-028392	ABBS1150	MIC-3D-20GE-SFP
MIC 1	REV 26	750-028387	ABBR9582	MIC-3D-4XGE-XFP
FPC 9	REV 11	750-036284	ZL3591	MPCE-3D-16XGE-SFPP
ADC 0	REV 05	750-043596	CAAC2073	750-043596
ADC 1	REV 01	750-043596	ZV4117	750-043596
ADC 8	REV 01	750-043596	ZV4107	750-043596
ADC 9	REV 02	750-043596	ZW1555	750-043596
Fan Tray 0	REV 2A	760-046960	ACAY0015	
Fan Tray 1	REV 2A	760-046960	ACAY0019	
Fan Tray 2	REV 2A	760-046960	ACAY0020	
Fan Tray 3	REV 2A	760-046960	ACAY0021	

### show chassis hardware node-device (QFabric Systems)

```

user@switch> show chassis hardware node-device node1
Routing Engine 0  BUILTIN      BUILTIN      QFX Routing Engine
node1            REV 05  711-032234  ED3694      QFX3500-48S4Q-AFI

CPU              BUILTIN      BUILTIN      FPC CPU
PIC 0            BUILTIN      BUILTIN      48x 10G-SFP+
Xcvr 8           REV 01  740-030658  AD0946A028B SFP+-10G-USR

```

### show chassis hardware scc (TX Matrix Router)

```

user@host> show chassis hardware scc
scc-re0:
-----
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
Midplane      REV 04  710-004396  RB0014        SCC Midplane
FPM GBUS      REV 04  710-004617  HW9141        SCC FPM Board
FPM Display   REV 04  710-004619  HS5950        SCC FPM
CIP 0         REV 01  710-010218  HV9151        SCC CIP
CIP 1         REV 01  710-010218  HV9152        SCC CIP
PEM 1         Rev 11  740-002595  QB13977       Power Entry Module
Routing Engine 0 REV 05  740-008883  P11123900153 RE-4.0 (RE-1600)

```

CB 0	REV 01	710-011709	HR5964	Control Board (CB-TX)
SPMB 0	REV 09	710-003229	HW5293	T Series Switch CPU
SIB 3				
SIB 4	REV 01	710-005839	HW1177	SIB-S8-F16
B Board	REV 01	710-005840	HW1202	SIB-S8-F16 (B)

### show chassis hardware sfc (TX Matrix Plus Router)

```
user@host> show chassis hardware sfc 0
```

```
sfc0-re0:
```

```
-----
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN112F007AHB	TXP
Midplane	REV 05	710-022574	TS4027	SFC Midplane
FPM Display	REV 03	710-024027	DX0282	TXP FPM Display
CIP 0	REV 04	710-023792	DW4889	TXP CIP
CIP 1	REV 04	710-023792	DW4887	TXP CIP
PEM 0	Rev 07	740-027463	UM26368	Power Entry Module
Routing Engine 0	REV 01	740-026942	737A-1064	SFC RE
Routing Engine 1	REV 01	740-026942	737A-1082	SFC RE
CB 0	REV 09	710-022606	DW6099	SFC Control Board
CB 1	REV 09	710-022606	DW6096	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 04	710-022600	DX0841	F13 SIB
B Board	REV 03	710-023431	DX0966	F13 SIB Mezz
SIB F13 1	REV 04	750-024564	DW5776	F13 SIB
B Board	REV 03	710-023431	DW9028	F13 SIB
SIB F13 3	REV 04	750-024564	DW5762	F13 SIB
B Board	REV 03	710-023431	DW9059	F13 SIB
SIB F13 4	REV 04	750-024564	DW5797	F13 SIB
B Board	REV 03	710-023431	DW9041	F13 SIB
SIB F13 6	REV 04	750-024564	DW5770	F13 SIB
B Board	REV 03	710-023431	DW9079	F13 SIB Mezz
SIB F13 7	REV 04	750-024564	DW5758	F13 SIB
B Board	REV 03	710-023431	DW9047	F13 SIB
SIB F13 8	REV 04	750-024564	DW5761	F13 SIB
B Board	REV 03	710-023431	DW9043	F13 SIB Mezz
SIB F13 9	REV 04	750-024564	DW5754	F13 SIB
B Board	REV 03	710-023431	DW9078	F13 SIB Mezz

SIB F13 11	REV 04	710-022600	DX0826	F13 SIB
B Board	REV 03	710-023431	DX0967	F13 SIB Mezz
SIB F13 12	REV 04	750-024564	DW5794	F13 SIB
B Board	REV 03	710-023431	DW9044	F13 SIB Mezz
SIB F2S 0/0	REV 05	710-022603	DW7897	F2S SIB
B Board	REV 05	710-023787	DW7657	NEO PMB
SIB F2S 0/2	REV 05	710-022603	DW7833	F2S SIB
B Board	REV 05	710-023787	DW7526	NEO PMB
SIB F2S 0/4	REV 05	710-022603	DW7875	F2S SIB
B Board	REV 05	710-023787	DW7588	NEO PMB
SIB F2S 0/6	REV 05	710-022603	DW7860	F2S SIB
B Board	REV 05	710-023787	DW7589	NEO PMB
SIB F2S 1/0	REV 04	710-022603	DW4820	F2S SIB
B Board	REV 05	710-023787	DW8510	NEO PMB
SIB F2S 1/2	REV 05	710-022603	DW7849	F2S SIB
B Board	REV 05	710-023787	DW7525	NEO PMB
SIB F2S 1/4	REV 05	710-022603	DW7927	F2S SIB
B Board	REV 05	710-023787	DW7556	F2S SIB Mezz
SIB F2S 1/6	REV 05	710-022603	DW7866	F2S SIB
B Board	REV 05	710-023787	DW7651	NEO PMB
SIB F2S 2/0	REV 05	710-022603	DW7880	F2S SIB
B Board	REV 05	710-023787	DW7523	NEO PMB
SIB F2S 2/2	REV 05	710-022603	DW7895	F2S SIB
B Board	REV 05	710-023787	DW7591	NEO PMB
SIB F2S 2/4	REV 05	710-022603	DW7907	F2S SIB
B Board	REV 05	710-023787	DW7590	NEO PMB
SIB F2S 2/6	REV 05	710-022603	DW7785	F2S SIB
B Board	REV 05	710-023787	DW7524	NEO PMB
SIB F2S 3/0	REV 05	710-022603	DW7782	F2S SIB
B Board	REV 05	710-023787	DW7634	NEO PMB
SIB F2S 3/2	REV 05	710-022603	DW7793	F2S SIB
B Board	REV 05	710-023787	DW7548	NEO PMB
SIB F2S 3/4	REV 05	710-022603	DW7779	F2S SIB
B Board	REV 05	710-023787	DW7587	NEO PMB
SIB F2S 3/6	REV 05	710-022603	DW7930	F2S SIB
B Board	REV 05	710-023787	DW7505	NEO PMB
SIB F2S 4/0	REV 05	710-022603	DW7867	F2S SIB
B Board	REV 05	710-023787	DW7656	NEO PMB
SIB F2S 4/2	REV 05	710-022603	DW7917	F2S SIB
B Board	REV 05	710-023787	DW7640	NEO PMB
SIB F2S 4/4	REV 05	710-022603	DW7929	F2S SIB
B Board	REV 05	710-023787	DW7643	NEO PMB
SIB F2S 4/6	REV 05	710-022603	DW7870	F2S SIB

B Board	REV 05	710-023787	DW7635	NEO PMB
Fan Tray 0	REV 06	760-024497	DV7831	Front Fan Tray
Fan Tray 1	REV 06	760-024497	DV9614	Front Fan Tray
Fan Tray 2	REV 06	760-024502	DV9618	Rear Fan Tray
Fan Tray 3	REV 06	760-024502	DV9616	Rear Fan Tray
Fan Tray 4	REV 06	760-024502	DV7807	Rear Fan Tray
Fan Tray 5	REV 06	760-024502	DV7828	Rear Fan Tray

### show chassis hardware (ACX7100-48L)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description	
Chassis			YW0220320039	JNP7100-48L	
[ACX7100-48L]					
PSM 1	REV 04	740-085431	1ED79520221	PSU 1600W AC, Front	Back
to					
Airflow					
Routing Engine 0	REV 04	611-112446	YY0220320013	RE-JNP-7100	
CB 0	REV 05	650-113149	YW0220320039	Control Board	
FPC 0		BUILTIN	BUILTIN	ACX7100-48L	
PIC 0		BUILTIN	BUILTIN	MRATE- 48xSFP56 +	P56-
6xQSF					
DD					
Xcvr 0	REV 01	740-068639	1A1M31A311008	SFP28-25G-BASE-SR	
Xcvr 1	REV 01	740-030658	AA1230AZYWW	SFP+-10G-USR	
Xcvr 2	REV 01	740-031980	AP42G0C	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	ARN2FS9	SFP+-10G-SR	
Xcvr 4	REV 01	740-031980	AP4150P	SFP+-10G-SR	
Xcvr 5	REV 01	740-031980	123363A01134	SFP+-10G-SR	
Xcvr 6	REV 01	740-031980	B11E02539	SFP+-10G-SR	
Xcvr 7	REV 01	740-031980	ARQ0WRX	SFP+-10G-SR	
Xcvr 12	REV 01	740-031980	193363A00707	SFP+-10G-SR	
Xcvr 15	REV 01	740-031980	AMS15RT	SFP+-10G-SR	
Xcvr 18	REV 01	740-068639	1A1M31A5370MX	SFP28-25G-BASE-SR	
Xcvr 19	REV 01	740-068639	1A1M31A5370MS	SFP28-25G-BASE-SR	
Xcvr 21	REV 01	740-068639	1A1M31A5370MW	SFP28-25G-BASE-SR	
Xcvr 22	REV 01	740-068639	1A1M31A5370MT	SFP28-25G-BASE-SR	
Xcvr 43	REV 01	740-031980	CH09KN1H4	SFP+-10G-SR	
Xcvr 44	REV 01	740-031980	AMB0TC1	SFP+-10G-SR	

Xcvr 46	REV 01	740-031980	AP40WQN	SFP+-10G-SR	
Xcvr 47	REV 01	740-031980	APR1BCS	SFP+-10G-SR	
Xcvr 48	REV 01	740-054053	XXH0KH1	QSFP+-4X10G-SR	
Xcvr 49	REV 01	740-058734	1ECQ144605L	QSFP-100GBASE-SR4	
Xcvr 50	REV 01	740-054053	XWP0Q7D	QSFP+-4X10G-SR	
Xcvr 51	REV 01	740-058734	1ECQ144604H	QSFP-100GBASE-SR4	
Xcvr 52	REV 01	740-054053	XXH0KGC	QSFP+-4X10G-SR	
Xcvr 53	REV 01	740-058734	1ECQ144605K	QSFP-100GBASE-SR4	
Fan Tray 0				JNP7100 Fan Tray,	
Front					to
Back Airflow - AFO					
Fan Tray 1				JNP7100 Fan Tray,	
Front					to
Back Airflow - AFO					
Fan Tray 2				JNP7100 Fan Tray,	
Front					to
Back Airflow - AFO					
Fan Tray 3				JNP7100 Fan Tray,	
Front					to
Back Airflow - AFO					
Fan Tray 4				JNP7100 Fan Tray,	
Front					to
Back Airflow - AFO					
Fan Tray 5				JNP7100 Fan Tray,	
Front					to
Back Airflow - AFO					

### show chassis hardware (PTX10001-36MR) (Junos OS Evolved Release)

```

user@host> show chassis hardware
CB 0          REV 14   750-079562  CAKY1861      Control Board
FPC 0          REV 02   750-093524  BCAP3538      JNP10K-LC1201
CPU           REV 02   711-072984  BCAL3894      JNP10K-LC1201 PMB Board
PIC 0          BUILTIN  BUILTIN      JNP10K-36QDD-LC-PIC
Xcvr 1         REV 01   740-082823  1G1CZAA41200G QSFP56-DD-400GBASE-LR8
Xcvr 5         REV 01   740-059437  0000T3610     QSFP28-LPBK
Xcvr 8         REV 01   740-090170  INIBZ8090158A QSFP56-DD-400G-AOC-30M
Xcvr 12        XXXX    NON-JNPR    L1949D0016     QSFP56-DD-400G-ZR
Xcvr 14        XXXX    NON-JNPR    L1949D0047     QSFP56-DD-400G-ZR

```

## Release Information

Command introduced before Junos OS Release 7.4.

`models` option introduced in Junos OS Release 8.2.

`sfc` option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.

Information for `disk` and `usb` introduced in Junos OS Release 15.1X53-D60 for QFX10002, QFX10008, and QFX10016 switches.

**NOTE:** Routers and routing platforms use the basic syntax, unless otherwise listed. For example, the EX Series has an additional `satellite` parameter available.

## RELATED DOCUMENTATION

| [show chassis power](#)

## show flight-recorder status

### IN THIS SECTION

- [Syntax | 279](#)
- [Description | 279](#)
- [Options | 279](#)
- [Required Privilege Level | 279](#)
- [Output Fields | 279](#)
- [Sample Output | 280](#)
- [Release Information | 281](#)

Syntax

```
show flight-recorder status
```

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

Output Fields

[Table 7 on page 279](#) lists the output fields for the `show flight-recorder status` command. Output fields are listed in the approximate order in which they appear.

Table 7: show flight-recorder status Output Fields

Field Name	Field Description
Flight-recorder status	<div>State of the flight recorder tool:</div> <ul style="list-style-type: none"><li>Running—The flight recorder tool is enabled using the request <code>flight-recorder set high-cpu</code> command.</li><li>Not Running—The flight recorder tool is not enabled. By default, the flight recorder tool is disabled.</li></ul>



Table 7: 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"> <li>• Cpu-threshold—Specify the maximum value of CPU utilization in percentage, beyond which the collection of data is triggered.</li> <li>• Polling-frequency—Specify the time in seconds for polling for high CPU utilization.</li> <li>• Backoff-duration—Specify the time interval in seconds between two snapshots of data.</li> <li>• Num-snapshots—Specify the number of snapshots of data to be collected before quitting the collection process.</li> </ul>
Flags set	<p>Information about additional flags configured for the flight recorder tool:</p> <ul style="list-style-type: none"> <li>• Collect-core—Perform snapshot collection of the running core with every snapshot of data taken.</li> <li>• Logical System—Enable data collection on logical systems.</li> </ul>
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 <code>Flr_MONTH_DD_YYYY_HH:MM:SS</code>; for example, <code>Flr_May_09_2018_02:20:50</code>.</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

## Release Information

Command introduced in Junos OS Release 18.2R1.

## RELATED DOCUMENTATION

[request flight-recorder set high-cpu](#) | [175](#)

## show host

### IN THIS SECTION

- [Syntax](#) | [282](#)
- [Syntax \(Junos OS Evolved\)](#) | [282](#)
- [Syntax](#) | [282](#)
- [Description](#) | [282](#)
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- [Additional Information | 283](#)
- [Required Privilege Level | 283](#)
- [Sample Output | 283](#)
- [Release Information | 283](#)

**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>
```

**Syntax**

**Description**

Display Domain Name System (DNS) hostname information.

**Options**

<i>hostname</i>	Hostname or address.
routing-instance mgmt_junos	(Optional) Side host server that is running.
server <i>server-name</i>	(Optional) Name server to use.

## Additional Information

The `show host` command displays the raw data received from the name server.

## Required Privilege Level

view

## 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:
```

## Release Information

Command introduced before Junos OS Release 7.4.

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.

## show log

### IN THIS SECTION

- [Syntax | 284](#)
- [Syntax \(QFX Series and OCX Series\) | 284](#)
- [Syntax \(TX Matrix Router\) | 284](#)
- [Description | 284](#)

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- Required Privilege Level | 286
- Sample Output | 286
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## 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>>
```

## 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

<b>none</b>	List all log files.
<b>&lt;all-lcc   lcc number   scc&gt;</b>	(Routing matrix only)(Optional) Display logging information about all T640 routers (or line-card chassis) or a specific T640 router (replace <i>number</i> 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).
<b>device-type</b>	(QFabric system only) (Optional) Display log messages for only one of the following device types: <ul style="list-style-type: none"><li>• director-device—Display logs for Director devices.</li><li>• 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).</li><li>• interconnect-device—Display logs for Interconnect devices.</li><li>• node-device—Display logs for Node devices.</li></ul>

**NOTE:** If you specify the device-type optional parameter, you must also specify either the device-id or device-alias optional parameter.

<b>(device-id   device-alias)</b>	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).
<b>filename</b>	(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** (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.

**<username>**

## Required Privilege Level

trace

## 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 wtmp
```

### show log filename

```
user@host> show log rpd
Oct  1 18:00:18 trace_on: Tracing to ?/var/log/rpd? started
Oct  1 18:00:18 EVENT <MTU> ds-5/2/0.0 index 24 <Broadcast PointToPoint Multicast
Oct  1 18:00:18
Oct  1 18:00:19 KRT recv len 56 V9 seq 148 op add Type route/if af 2 addr 192.0.2.21 nhop type
local nhop 192.0.2.21
Oct  1 18:00:19 KRT recv len 56 V9 seq 149 op add Type route/if af 2 addr 192.0.2.22 nhop type
unicast nhop 192.0.2.22
Oct  1 18:00:19 KRT recv len 48 V9 seq 150 op add Type ifaddr index 24 devindex 43
```

```

Oct  1 18:00:19 KRT recv len 144 V9 seq 151 op chnge Type ifdev devindex 44
Oct  1 18:00:19 KRT recv len 144 V9 seq 152 op chnge Type ifdev devindex 45
Oct  1 18:00:19 KRT recv len 144 V9 seq 153 op chnge Type ifdev devindex 46
Oct  1 18:00:19 KRT recv len 1272 V9 seq 154 op chnge Type ifdev devindex 47
...

user@host:LSYS1> show log flow_lsys1.log
Nov  7 07:34:09 07:34:09.491800:CID-0:THREAD_ID-00:LSYS_ID-01:RT:got route table lock

Nov  7 07:34:09 07:34:09.491809:CID-0:THREAD_ID-00:LSYS_ID-01:RT:released route table lock

Nov  7 07:34:09 07:34:09.491840:CID-0:THREAD_ID-00:LSYS_ID-01:RT:got route table lock

Nov  7 07:34:09 07:34:09.491841:CID-0:THREAD_ID-00:LSYS_ID-01:RT:released route table lock

Nov  7 07:34:09 07:34:09.491854:CID-0:THREAD_ID-00:LSYS_ID-01:RT:cache final sw_nh 0x0

Nov  7 07:34:09 07:34:09.491868:CID-0:THREAD_ID-00:LSYS_ID-01:RT:got route table lock

Nov  7 07:34:09 07:34:09.491869:CID-0:THREAD_ID-00:LSYS_ID-01:RT:released route table lock

Nov  7 07:34:09 07:34:09.491881:CID-0:THREAD_ID-00:LSYS_ID-01:RT:cache final sw_nh 0x0
user@host:TSYS1> show log flow_tsys1.log
Nov  7 13:21:47 13:21:47.217744:CID-0:THREAD_ID-05:LSYS_ID-32:RT:<192.0.2.0/0-
>198.51.100.0/9011;1,0x0> :

Nov  7 13:21:47 13:21:47.217747:CID-0:THREAD_ID-05:LSYS_ID-32:RT:packet [84] ipid = 39281,
@0x7f490ae56d52

Nov  7 13:21:47 13:21:47.217749:CID-0:THREAD_ID-05:LSYS_ID-32:RT:---- flow_process_pkt: (thd 5):
flow_ctxt type 0, common flag 0x0, mbuf 0x4882b600, rtbl7

Nov  7 13:21:47 13:21:47.217752:CID-0:THREAD_ID-05:LSYS_ID-32:RT: flow process pak fast ifl 88
in_ifp lt-0/0/0.101

Nov  7 13:21:47 13:21:47.217753:CID-0:THREAD_ID-05:LSYS_ID-32:RT: lt-0/0/0.101:192.0.2.0-
>198.51.100.0, icmp, (0/0)

Nov  7 13:21:47 13:21:47.217756:CID-0:THREAD_ID-05:LSYS_ID-32:RT: find flow: table 0x11d0a2680,
hash 20069(0xffff), sa 192.0.2.0, da 198.51.100.0, sp 0, d0

Nov  7 13:21:47 13:21:47.217760:CID-0:THREAD_ID-05:LSYS_ID-32:RT:Found: session id 0x12. sess
tok 28685

```



```

Nov  7 13:21:47 13:21:47.217761:CID-0:THREAD_ID-05:LSYS_ID-32:RT: flow got session.

Nov  7 13:21:47 13:21:47.217761:CID-0:THREAD_ID-05:LSYS_ID-32:RT: flow session id 18

Nov  7 13:21:47 13:21:47.217763:CID-0:THREAD_ID-05:LSYS_ID-32:RT: vector bits 0x200 vector
0x84ae85f0

Nov  7 13:21:47 13:21:47.217764:CID-0:THREAD_ID-05:LSYS_ID-32:RT:set nat 0x11e463550(18) timeout
const to 2

Nov  7 13:21:47 13:21:47.217765:CID-0:THREAD_ID-05:LSYS_ID-32:RT: set_nat_timeout 2 on session 18

Nov  7 13:21:47 13:21:47.217765:CID-0:THREAD_ID-05:LSYS_ID-32:RT:refresh nat 0x11e463550(18)
timeout to 2

Nov  7 13:21:47 13:21:47.217767:CID-0:THREAD_ID-05:LSYS_ID-32:RT:insert usp tag for apps

Nov  7 13:21:47 13:21:47.217768:CID-0:THREAD_ID-05:LSYS_ID-32:RT:mbuf 0x4882b600, exit nh
0xffffb0006

```

### 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 log accepted-traffic (SRX4600, SRX5400, SRX5600, and SRX5800)

```

user@host> show log accepted-traffic

```

```

Jul 17 20:26:04 sourpunch RT_FLOW: RT_FLOW_SESSION_CREATE: session created 3.3.3.5/2-
>4.4.4.2/63 0x0 None 3.3.3.5/2->4.4.4.2/63 0x0 N/A N/A N/A N/A 17 p2 TRUST UNTRUST 2617282058
N/A(N/A) xe-7/0/0.0 UNKNOWN UNKNOWN UNKNOWN N/A N/A -1 N/A N/A N/A
Jul 17 20:26:04 sourpunch RT_FLOW: RT_FLOW_SESSION_CREATE: session created 3.3.3.4/4-
>4.4.4.2/63 0x0 None 3.3.3.4/4->4.4.4.2/63 0x0 N/A N/A N/A N/A 17 p2 TRUST UNTRUST 2550162754
N/A(N/A) xe-7/0/0.0 UNKNOWN UNKNOWN UNKNOWN N/A N/A -1 N/A N/A N/A
Jul 17 20:26:04 sourpunch RT_FLOW: RT_FLOW_SESSION_CREATE: session created 3.3.3.4/1-
>4.4.4.2/63 0x0 None 3.3.3.4/1->4.4.4.2/63 0x0 N/A N/A N/A N/A 17 p2 TRUST UNTRUST 2550162755
N/A(N/A) xe-7/0/0.0 UNKNOWN UNKNOWN UNKNOWN N/A N/A -1 N/A N/A N/A
Jul 17 20:26:04 sourpunch RT_FLOW: RT_FLOW_SESSION_CREATE: session created 3.3.3.3/0-

```

```
>4.4.4.2/63 0x0 None 3.3.3.3/0->4.4.4.2/63 0x0 N/A N/A N/A N/A 17 p2 TRUST UNTRUST 2550162752
N/A(N/A) xe-7/0/0.0 UNKNOWN UNKNOWN UNKNOWN N/A N/A -1 N/A N/A N/A
Jul 17 20:26:04 sourpunch RT_FLOW: RT_FLOW_SESSION_CREATE: session created 3.3.3.5/5-
>4.4.4.2/63 0x0 None 3.3.3.5/5->4.4.4.2/63 0x0 N/A N/A N/A N/A 17 p2 TRUST UNTRUST 2550162751
N/A(N/A) xe-7/0/0.0 UNKNOWN UNKNOWN UNKNOWN N/A N/A -1 N/A N/A N/A
Jul 17 20:26:04 sourpunch RT_FLOW: RT_FLOW_SESSION_CREATE: session created 3.3.3.3/3-
>4.4.4.2/63 0x0 None 3.3.3.3/3->4.4.4.2/63 0x0 N/A N/A N/A N/A 17 p2 TRUST UNTRUST 2550162753
N/A(N/A) xe-7/0/0.0 UNKNOWN UNKNOWN UNKNOWN N/A N/A -1 N/A N/A N/A
```

Release Information

Command introduced before Junos OS Release 7.4.

Option *device-type* (*device-id* | *device-alias*) is introduced in Junos OS Release 13.1 for the QFX Series.

RELATED DOCUMENTATION

| [syslog \(System\)](#)

show system connections

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## 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>
```

## 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

<b>none</b>	Display information about all active IP sockets on the Routing Engine.
<b>extensive</b>	(Optional) Display exhaustive system process information, which, for TCP connections, includes the TCP control block. This option is useful for debugging TCP connections.
<b>all-chassis</b>	(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system connection activity for all the routers in the chassis.
<b>all-lcc</b>	(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
<b>all-members</b>	(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for all members of the Virtual Chassis configuration.
<b>inet   inet6</b>	(Optional) Display IPv4 connections or IPv6 connections, respectively.
<b>infrastructure <i>name</i></b>	(QFabric systems only) (Optional) Display system connection activity for the fabric control Routing Engines or fabric manager Routing Engines.
<b>interconnect-device <i>name</i></b>	(QFabric systems only) (Optional) Display system connection activity for the Interconnect device.
<b>lcc <i>number</i></b>	(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.

<b>local</b>	(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for the local Virtual Chassis member.
<b>member <i>member-id</i></b>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>node <i>node-name</i></b>	(Junos OS Evolved only) (Optional) Display system connection activity for the specified node.
<b>node-group <i>name</i></b>	(QFabric systems only) (Optional) Display system connection activity for the Node group.
<b>scc</b>	(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix router (or switch-card chassis).
<b>sfc</b>	(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix Plus router.
<b>show-routing-instances</b>	(Optional) Display routing instances.

## Additional Information

By default, when you issue the `show system connections` command on the primary Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the primary 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

## Output Fields

[Table 8 on page 295](#) describes the output fields for the `show system connections` command. Output fields are listed in the approximate order in which they appear.

**Table 8: 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 <code>show-routing-instance</code> option is used.) Routing instances associated with active IP sockets on the Routing Engine.
(state)	For TCP, the protocol state of the socket.



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 1192.0.2.4.59103   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

## 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.

Options extensive and show-routing-instance deprecated in Junos OS Evolved Release 17.3.

node option introduced in Junos OS Evolved Release 18.3R1.

## RELATED DOCUMENTATION

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## show system name-resolution

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Syntax

```
show system name-resolution
```

Description

Display hostname-to-IP-address mappings.

Options

This command has no options.

Required Privilege Level

view

Output Fields

[Table 9 on page 300](#) lists the output fields for the `show system name-resolution` command. Output fields are listed in the approximate order in which they appear.

**Table 9: 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.

**Table 9: show system name-resolution Output Fields (Continued)**

Field Name	Field Description
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****command-name**

```
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: ntp1
```

```
Addresses:
```

```
3.3.3.11
```

```
Last change: Mon Sep 29 18:42:20 2008
```

```
Host: radauth1
```

```
Error: Host name lookup failure
```

```
Last change: Mon Sep 29 18:42:20 2008
```

```
Host: radacct1
```

```
Error: Host name lookup failure
```

```
Host: snmp1
```

```
Addresses:
```

```
4.4.4.1
```

```
4.4.4.2
```

```
Last change: Mon Sep 29 18:45:20 2008
```

```
Host: sys1
```

```
Addresses:
```

```
192.168.68.69
```

```
Last change: Mon Sep 29 18:42:21 2008
```

## Release Information

Command introduced in Junos OS Release 9.6.

## show version (Junos OS)

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- [Syntax \(EX Series Switches\) | 302](#)
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## 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>
```

## 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.

**Table 10: 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
junos-vmhost-install-*	Junos OS with upgraded FreeBSD on a VM Host

## Options

<b>none</b>	Display standard information about the hostname and version of the software running on the router or switch.
<b>brief   detail</b>	(Optional) Display the specified level of output.
<b>all-members</b>	(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.
<b>component all</b>	(QFabric systems only) (Optional) Display the host name and version information about the software running on all the components on the QFabric system.
<b>component component- name</b>	(QFabric systems only) (Optional) Display the host name and version information about the software running on a specific QFabric system component. Replace <i>component-name</i> with the name of the QFabric system component. The <i>component-name</i> can be the name of a diagnostics Routing Engine, Director group, fabric control Routing Engine, fabric manager Routing Engine, Interconnect device, or Node group.
<b>local</b>	(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.

<b>member <i>member-id</i></b>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>node (all   <i>node-name</i>)</b>	(Optional) Display version information for the specified node or all nodes.
<b>scc</b>	(TX Matrix routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix router (or switch-card chassis).
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>sfc <i>number</i></b>	(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 <i>number</i> with 0.

## Additional Information

By default, when you issue the `show version` command on a TX Matrix or TX Matrix Plus primary 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) primary 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

## 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]

```

## show version psd 1

```

{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]

```

## 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.

## start shell

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- [Required Privilege Level | 309](#)
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- [Release Information | 310](#)

## Syntax

```
start shell (csh | sh)
<user username>
```

## 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

<b>cs</b> <b>h</b>	Create a UNIX C shell.
<b>sh</b>	Create a UNIX Bourne shell.
<b>user</b> <i>username</i>	(Optional) Start the shell as another user.

## Additional Information

When you are in the shell, the shell prompt has the following format:

```
username@hostname%
```

An example of the prompt is:

```
root@host%
```

## Required Privilege Level

shell or maintenance

## 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>
```

## Release Information

Command introduced before Junos OS Release 7.4.

# System Software Monitoring Commands

## IN THIS CHAPTER

- `show fib-local-accounting ip` | 312
- `show system commit` | 313
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# show fib-local-accounting ip

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## Syntax

```
show fib-local-accounting ip
```

## Description

Display the number of packets that were sent to an anchor MPC due to FIB localization.

## Required Privilege Level

view

## Sample Output

### show fib-local-accounting ip

```
user@host> show fib-local-accounting ip
PFE 0
      fe_addr      packets      bytes
      28            0            0
      29            0            0
      30            0            0
      31            0            0
PFE 1
```

fe_addr	packets	bytes
28	0	0
29	0	0
30	0	0
31	0	0

Release Information

Command introduced in Junos OS Release 12.3.

RELATED DOCUMENTATION

<a href="#">fib-remote   105</a>
<a href="#">fib-local   103</a>
<a href="#">Example: Configuring Packet Forwarding Engine FIB Localization   32</a>

show system commit

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Syntax

```
show system commit
<revision | server | synchronize-server pending-jobs | include-configuration-revision>
```

### Description

Display the system commit history and pending commit operations.

### Options

<b>none</b>	Display the last 50 commit operations on the static configuration database, starting with the most recent.
<b>revision</b>	(Optional) Display the revision number of the active configuration of the Routing Engine(s).
<b>server</b>	(Optional) Display the 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.

<b>synchronize-server pending-jobs</b>	(Optional) Display the pending commit synchronize operations for all instances of the ephemeral configuration database on an MX Series Virtual Chassis or a device with dual Routing Engines. This option can only be executed on the primary Routing Engine of the Virtual Chassis primary router or the dual Routing Engine system.
<b>include-configuration-revision</b>	(Optional) Display configuration revision information including the revision identifier string for each commit record.

### Required Privilege Level

view

### Output Fields

[Table 11 on page 315](#) describes the output fields for the `show system commit` command. Output fields are listed in the approximate order in which they appear.

**Table 11: show system commit Output Fields**

Field Name	Field Description	Level of Output
<i>&lt;number&gt;</i>	Displays the last 50 commit operations listed, most recent to first. The identifier <i>&lt;number&gt;</i> designates a configuration created for recovery using the request system configuration rescue save command.	none
<i>&lt;time-stamp&gt;</i>	Date and time of the commit operation.	none
<i>&lt;root&gt;/ &lt;username&gt;</i>	User who executed the commit operation.	none
<i>&lt;method&gt;</i>	<p>Method used to execute the commit operation:</p> <ul style="list-style-type: none"> <li>• CLI—CLI interactive user performed the commit operation.</li> <li>• Junos XML protocol—Junos XML protocol client performed the commit operation.</li> <li>• synchronize—The commit synchronize command was performed on the other Routing Engine.</li> <li>• snmp—An SNMP set request caused the commit operation.</li> <li>• button—A button on the router or switch was pressed to commit a rescue configuration for recovery.</li> <li>• autoinstall—A configuration obtained through autoinstallation was committed.</li> <li>• 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.</li> </ul>	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 commit synchronize-server pending-jobs

```
user@host> show system commit synchronize-server pending-jobs
```

Job Id	Commit Synchronize Model	Database	Version
36	Asynchronous Commit	ephemeral	130
37	Asynchronous Commit	ephemeral	131
38	Asynchronous Commit	ephemeral	132
39	Asynchronous Commit	ephemeral	133
40	Asynchronous Commit	ephemeral	134
41	Asynchronous Commit	ephemeral	135
42	Asynchronous Commit	ephemeral	2

## show system commit include-configuration-revision

```
user@host> show system commit include-configuration-revision
```

0	2020-08-02 00:42:58 IST by user via cli re0-1596309177-4
1	2020-08-02 00:42:53 IST by user via cli re0-1596309173-3
2	2020-08-02 00:42:50 IST by user via cli re0-1596309170-2
3	2020-08-02 00:42:40 IST by user via other re0-1596309160-1

## Release Information

Command introduced before Junos OS Release 7.4.

Option server introduced in Junos OS Release 12.1 for the PTX Series router.

Option revision introduced in Junos OS Release 14.1.

Option synchronize-server introduced in Junos OS Release 17.2R1.

Option include-configuration-revision introduced in Junos OS Release 20.4R1 and Junos OS Evolved Release 20.4R1.

## RELATED DOCUMENTATION

*clear system commit*

[show system commit revision](#)

# show system configuration database usage

IN THIS SECTION

- [Syntax | 318](#)
- [Description | 318](#)
- [Options | 318](#)
- [Required Privilege Level | 318](#)
- [Output Fields | 318](#)
- [Sample Output | 319](#)
- [Release Information | 319](#)

## Syntax

```
show system configuration database usage
```

## Description

Display configuration database disk space usage statistics.

## Options

This command has no options.

## Required Privilege Level

maintenance

## Output Fields

[Table 12 on page 319](#) 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 12: 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
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

```

## Release Information

Command introduced in Junos OS Release 15.1.

## RELATED DOCUMENTATION

[Overview for Junos OS](#)



## show system information

### IN THIS SECTION

- [Syntax | 320](#)
- [Description | 320](#)
- [Options | 320](#)
- [Required Privilege Level | 320](#)
- [Sample Output | 321](#)
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### Syntax

```
show system information
```

### 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
```

## Release Information

Command introduced in Junos OS Release 17.2.

## show system processes

### IN THIS SECTION

- [Syntax | 322](#)
- [Syntax \(EX Series Switches and MX Series Routers\) | 322](#)
- [Syntax \(QFX Series Switches\) | 322](#)
- [Syntax \(OCX Series\) | 323](#)
- [Syntax \(TX Matrix Routers\) | 323](#)
- [Syntax \(TX Matrix Plus Router\) | 323](#)
- [Syntax \(Junos OS Evolved\) | 323](#)
- [Description | 323](#)
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- [Additional Information | 331](#)
- [Required Privilege Level | 331](#)
- [Output Fields | 331](#)
- [Sample Output | 338](#)
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## 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-identifer | process-name process-name)>
host-processes (brief|detail )
<providers>
<resource-limits>
<wide>
```

## Syntax (TX Matrix Routers)

```
show system processes
<brief | detail | extensive | summary>
<all-chassis| all-lcc | lcc number | scc>
<wide>
```

## Syntax (TX Matrix Plus Router)

```
show system processes
<brief | detail | extensive | summary>
<all-chassis| all-lcc | lcc number | sfc number>
<wide>
```

## Syntax (Junos OS Evolved)

```
show system processes
<brief | detail | extensive | summary>
<node node-name>
<wide>
```

## Description

Display information about software processes that are running on the router or switch and that have controlling terminals.

## Options

<b>none</b>	Display standard information about system processes.
<b>brief   detail   extensive   summary</b>	(Optional) Display the specified level of detail.
<b>adaptive-services</b>	(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.
<b>alarm-control</b>	(Optional) Display the process to configure the system alarm.
<b>all-chassis</b>	(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.
<b>all-lcc</b>	(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.
<b>all-members</b>	(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers ) (Optional) Display standard system process information for all members of the Virtual Chassis configuration.
<b>ancpd-service</b>	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.
<b>application- identification</b>	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.
<b>audit-process</b>	(Optional) Display the RADIUS accounting process.
<b>auto-configuration</b>	Display the Interface Auto-Configuration process.
<b>bootp</b>	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.

<b>captive-portal-content-delivery</b>	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.
<b>ce-l2tp-service</b>	(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.
<b>cfm</b>	Display Ethernet Operations, Administration, and Maintenance (OAM) connectivity fault management (CFM) process, which can be used to monitor the physical link between two switches.
<b>chassis-control</b>	(Optional) Display the chassis management process.
<b>class-of-service</b>	(Optional) Display the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.
<b>clksyncd-service</b>	Display the external clock synchronization process, which uses synchronous Ethernet (SyncE).
<b>craft-control</b>	Display the process for the I/O of the craft interface.
<b>database-replication</b>	(EX Series switches and MX Series routers only) (Optional) Display the database replication process.
<b>datapath-trace-service</b>	Display the packet path tracing process.
<b>dhcp-service</b>	(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.
<b>diameter-service</b>	(Optional) Display the diameter process.
<b>disk-monitoring</b>	(Optional) Display the disk monitoring process, which checks the health of the hard disk drive on the Routing Engine.
<b>dynamic-flow-capture</b>	(Optional) Display the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.
<b>ecc-error-logging</b>	(Optional) Display the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

<b>ethernet-connectivity-fault-management</b>	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.
<b>ethernet-link-fault-management</b>	(EX Series switches and MX Series routers only) (Optional) Display the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.
<b>event-processing</b>	(Optional) Display the event process (eventd).
<b>firewall</b>	(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.
<b>general-authentication-service</b>	(EX Series switches and MX Series routers only) (Optional) Display the general authentication process.
<b>health (pid <i>process-identifier</i>   process-name <i>process-name</i>)</b>	(Optional) Display process health information, either by process id (PID) or by process name.
<b>host-processes</b>	<p>Display process information of processes running on the host system.</p> <p>(On OCX Series only) The following options are available:</p> <ul style="list-style-type: none"> <li>• <b>brief   detail</b>—(Optional) Display the specified level of detail.</li> </ul>
<b>iccp-service</b>	Display the Inter-Chassis Communication Protocol (ICCP) process.
<b>idp-policy</b>	Display the intrusion detection and prevention (IDP) protocol process.
<b>ilmi</b>	Display the Integrated Local Management Interface (ILMI) protocol process, which provides bidirectional exchange of management information between two ATM interfaces across a physical connection.
<b>inet-process</b>	Display the IP multicast family process.
<b>init</b>	Display the process that initializes the USB modem.
<b>interface-control</b>	(Optional) Display the interface process, which controls the router's or switch's physical interface devices and logical interfaces.
<b>kernel-replication</b>	(Optional) Display the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

<b>l2-learning</b>	(Optional) Display the Layer 2 address flooding and learning process.
<b>l2cpd-service</b>	Display the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.
<b>lACP</b>	(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.
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>local</b>	(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for the local Virtual Chassis member.
<b>local-policy-decision-function</b>	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.
<b>logical-system-mux</b>	Display the logical router multiplexer process (lrmuxd), which manages the multiple instances of the routing protocols process (rpd) on a machine running logical routers.



<b>mac-validation</b>	Display the MAC validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.
<b>member <i>member-id</i></b>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>mib-process</b>	(Optional) Display the MIB II process, which provides the router's MIB II agent.
<b>mobile-ip</b>	(Optional) Display the Mobile IP process, which configures Junos OS Mobile IP features.
<b>mountd-service</b>	(EX Series switches and MX Series routers only) (Optional) Display the service for NFS mounts requests.
<b>mpls-traceroute</b>	(Optional) Display the MPLS Periodic Traceroute process.
<b>mspd</b>	(Optional) Display the Multiservice process.
<b>multicast-snooping</b>	(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.
<b>named-service</b>	(Optional) Display the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.
<b>neighbor-liveness</b>	Display the process, which specifies the maximum length of time that the router waits for its neighbor to re-establish an LDP session.
<b>nfsd-service</b>	(Optional) Display the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.
<b>ntp</b>	Display the Network Time Protocol (NTP) process, which provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network.
<b>packet-triggered-subscribers</b>	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.

<b>peer-selection-service</b>	(Optional) Display the Peer Selection Service process.
<b>periodic-packet-services</b>	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.
<b>pfe</b>	Display the Packet Forwarding Engine management process.
<b>pgcp-service</b>	(Optional) Display the pgcpd service process running on the Routing Engine.
<b>pgm</b>	Display the Pragmatic General Multicast (PGM) protocol process, which enables a reliable transport layer for multicast applications.
<b>pic-services-logging</b>	(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.
<b>ppp</b>	(Optional) Display the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.
<b>ppp-service</b>	Display the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.
<b>pppoe</b>	(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.
<b>process-monitor</b>	Display the process health monitor process (pmond).
<b>providers</b>	(Optional) Display provider processes.
<b>redundancy-interface-process</b>	(Optional) Display the ASP redundancy process.
<b>remote-operations</b>	(Optional) Display the remote operations process, which provides the ping and traceroute MIBs.
<b>resource-cleanup</b>	Display the resource cleanup process.
<b>resource-limits (brief   detail) <i>process-name</i></b>	(Optional) Display process resource limits.
<b>routing</b>	(Optional) Display the routing protocol process.

<b>sampling</b>	(Optional) Display the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.
<b>sbc-configuration-process</b>	Display the session border controller (SBC) process of the border signaling gateway (BSG).
<b>scc</b>	(TX Matrix routers only) (Optional) Display standard system process information for the TX Matrix router (or switch-card chassis).
<b>sdk-service</b>	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.
<b>secure-neighbor-discovery</b>	(EX Series switches and MX Series routers only) (Optional) Display the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.
<b>send</b>	(Optional) Display the Secure Neighbor Discovery Protocol (SEND) process, which provides support for protecting Neighbor Discovery Protocol (NDP) messages.
<b>service-deployment</b>	(Optional) Display the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.
<b>sfc <i>number</i></b>	(TX Matrix Plus routers only) (Optional) Display system process information for the TX Matrix Plus router. Replace <i>number</i> with 0.
<b>snmp</b>	Display the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP primary agent.
<b>sonet-aps</b>	Display the SONET Automatic Protection Switching (APS) process, which monitors any SONET interface that participates in APS.
<b>static-subscribers</b>	(Optional) Display the Static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.
<b>tunnel-oamd</b>	(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.

<b>vrp</b>	(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.
<b>watchdog</b>	Display the watchdog timer process, which enables the watchdog timer when Junos OS encounters a problem.
<b>wide</b>	(Optional) Display process information that might be wider than 80 columns.
<b>node <i>node-name</i></b>	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 primary Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the primary 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

## 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 13: 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

Table 13: show system processes Output Fields (*Continued*)

Field Name	Field Description	Level of Output
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)</p> <p>Breakdown of the percent usage on a per-CPU basis into the following categories: % user, % nice, % system, % interrupt, % idle.</p> <p><b>NOTE:</b> This field shows up in the second frame of output.</p> <p>To see which platforms run Junos OS with upgraded FreeBSD, see <a href="#">Release Information for Junos OS with Upgraded FreeBSD</a>.</p>	extensive
Mem	Information about physical and virtual memory allocation.	brief extensive summary

Table 13: 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, inactive 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 Inactive 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 Inactive 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 Inactive 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 Inactive 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 Inactive list remain untouched – even if they have not been accessed recently – when the amount of Free memory is adequate.</p>	brief extensive summary
Inactive	<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 Inactive queue into the Cache or Free list unless there is a memory shortage.</p>	brief extensive summary

Table 13: show system processes Output Fields (*Continued*)

Field Name	Field Description	Level of Output
Wired	Memory that is not eligible to be swapped, usually used for in-kernel memory structures and/or memory physically locked by a process.	brief extensive summary
Cache	Memory that is not associated with any program and does not need to be swapped before being reused.	brief extensive summary
Buf	Size of memory buffer used to hold data recently called from the disk.	brief extensive summary
Free	Memory that is not associated with any programs. Memory freed by a process can become Inactive, Cache, or Free, depending on the method used by the process to free the memory.	brief extensive summary
Swap	Information about physical and virtual memory allocation.  <b>NOTE:</b> 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

Table 13: show system processes Output Fields (*Continued*)

Field Name	Field Description	Level of Output
STAT	<p>Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process:</p> <ul style="list-style-type: none"> <li>• D—In disk or other short-term, uninterruptible wait</li> <li>• I—Idle (sleeping longer than about 20 seconds)</li> <li>• R—Runnable</li> <li>• S—Sleeping for less than 20 seconds</li> <li>• T—Stopped</li> <li>• Z—Dead (zombie)</li> <li>• + —The process is in the foreground process group of its control terminal.</li> <li>• &lt;—The process has raised CPU scheduling priority.</li> <li>• &gt;—The process has specified a soft limit on memory requirements and is currently exceeding that limit; such a process is not swapped.</li> <li>• A—The process requested random page replacement.</li> <li>• E—The process is trying to exit.</li> <li>• L—The process has pages locked in core.</li> <li>• N—The process has reduced CPU scheduling priority.</li> <li>• S—The process requested first-in, first-out (FIFO) page replacement.</li> <li>• s—The process is a session leader.</li> <li>• V—The process is temporarily suspended.</li> <li>• W—The process is swapped out.</li> <li>• X—The process is being traced or debugged.</li> </ul>	none detail



Table 13: show system processes Output Fields (*Continued*)

Field Name	Field Description	Level of Output
UID	User identifier.	detail
USERNAME	Process owner.	extensive summary
PPID	Parent process identifier.	detail
CPU	<p><b>(D)</b> Short-term CPU usage.</p> <p><b>(E and S)</b> Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.</p>	detail extensive summary
RSS	Resident set size.	detail
WCHAN	Symbolic name of the wait channel.	detail
STARTED	Local time when the process started running.	detail
PRI	Current priority of the process. A lower number indicates a higher priority.	detail extensive summary
NI or NICE	UNIX "niceness" value. A lower number indicates a higher priority.	detail extensive summary
SIZE	Total size of the process (text, data, and stack), in kilobytes.	extensive summary

Table 13: show system processes Output Fields (*Continued*)

Field Name	Field Description	Level of Output
RES	<p>Current amount of program resident memory, in kilobytes.</p> <p>This is also known as RSS or Resident Set Size. The RES value includes shared library pages used by the process. Any amount of memory freed by the process might still be considered part of the RES value. Generally, the kernel delays the migrating of memory out of the Inact queue into the Cache or Free list unless there is a memory shortage. This can lead to large discrepancies between the values reported by the routing protocol process and the kernel, even after the routing protocol process has freed a large amount of memory.</p>	extensive summary
STATE	Current state of the process (for example, sleep, wait, run, idle, zombie, or stop).	extensive summary
C	<p>CPU number.</p> <p><b>NOTE:</b> There is no such column in output from Junos OS Evolved. To see the CPU number, issue the <code>show system processes wide   detail</code> command and look at the PSR column.</p>	extensive summary
TIME	<p><b>(S)</b>                      Number of system and user CPU seconds that the process has used.</p> <p><b>(None, D, and E)</b>        Total amount of time that the command has been running.</p>	detail extensive summary
WCPU	Weighted CPU usage.	extensive summary
COMMAND	<p>Command that is currently running.</p> <p>(MX Series routers only) When you display the software processes for an MX Series Virtual Chassis, the <code>show system processes</code> command does not display information about the relayd process.</p>	detail extensive summary

**Table 13: show system processes Output Fields (Continued)**

Field Name	Field Description	Level of Output
THR	Number of threads in the process	extensive

## Sample Output

### show system processes

```

user@host> show system processes
PID  TT  STAT      TIME COMMAND
   0  ??  DLs    0:00.70 (swapper)
   1  ??  Is     0:00.35 /sbin/init --
   2  ??  DL     0:00.00 (pagedaemon)
   3  ??  DL     0:00.00 (vmdaemon)
   4  ??  DL     0:42.37 (update)
   5  ??  DL     0:00.00 (if_jnx)
  80  ??  Ss     0:14.66 syslogd -s
  96  ??  Is     0:00.01 portmap
 128  ??  Is     0:02.70 cron
 173  ??  Is     0:02.24 /usr/local/sbin/sshd (sshd1)
 189  ??  S      0:03.80 /sbin/watchdog -t180
 190  ??  I      0:00.03 /usr/sbin/tnetd -N
 191  ??  S      2:24.76 /sbin/ifd -N
 192  ??  S<     0:55.44 /usr/sbin/xntpd -N
 195  ??  S      0:53.11 /usr/sbin/snmpd -N
 196  ??  S      1:15.73 /usr/sbin/mib2d -N
 198  ??  I      0:00.75 /usr/sbin/inetd -N
2677  ??  I      0:00.01 /usr/sbin/mgd -N
2712  ??  Ss     0:00.24 rlogind
2735  ??  R      0:00.00 /bin/ps -ax
1985 p0- S    0:07.41 ./rpd -N
2713 p0 Is    0:00.24 -tcsh (tcsh)
2726 p0 S+    0:00.07 cli

```

## show system processes brief

```
user@host> show system processes brief
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free
```

## show system processes detail

```
user@host> show system processes detail
```

PID	UID	PPID	CPU	PRI	NI	RSS	WCHAN	STARTED	TT	STAT	TIME	COMMAND
11	0	0	0	155	0	64	-	Wed16	-	RL	6411:48.16	[idle]
17967	0	17936	0	24	0	96976	select	Wed16	-	S	138:17.79	/usr/sbin/chassisd -N
0	0	0	0	-16	0	384	swpin	Wed16	-	DLs	0:22.33	[kernel]
1	0	0	0	20	0	600	wait	Wed16	-	ILs	0:00.11	/sbin/init --
2	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:30.05	[jfe_job_0_0]
3	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_1_0]
4	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_1_1]
5	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_1_2]
6	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_1_3]
7	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_2_0]
8	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_3_0]
9	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_3_1]
10	0	0	0	-16	0	16	audit_wo	Wed16	-	DL	0:00.00	[audit]
12	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_3_2]
13	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_3_3]
14	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_4_0]
15	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_4_1]
16	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.00	[jfe_job_4_2]
17	0	0	0	-16	0	16	jfe_job_	Wed16	-	DL	0:00.92	[jfe_job_4_3]
18	0	0	0	-64	0	656	-	Wed16	-	WL	4:47.14	[intr]
19	0	0	0	-8	0	48	-	Wed16	-	DL	0:02.31	[geom]
20	0	0	0	-16	0	16	crypto_w	Wed16	-	DL	0:00.00	[crypto]
21	0	0	0	-16	0	16	crypto_r	Wed16	-	DL	0:00.00	[crypto returns]
22	0	0	0	-16	0	32	-	Wed16	-	DL	0:00.01	[cam]

## show system processes extensive

```
user@host> show system processes extensive
```

```
Mem: 241M Active, 99M Inact, 78M Wired, 325M Cache, 69M Buf, 1251M Free
```

```
Swap: 2048M Total, 2048M Free
```

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	COMMAND
11	root	1	171	52	0K	12K	RUN	807.5H	98.73%	idle
13	root	1	-20	-139	0K	12K	WAIT	36:17	0.00%	swi7: clock sio
1499	root	1	96	0	7212K	3040K	select	34:01	0.00%	license-check
1621	root	1	96	0	20968K	11216K	select	20:25	0.00%	mib2d
1465	root	2	8	-88	115M	11748K	nanslp	14:32	0.00%	chassisd
1478	root	1	96	0	6336K	3816K	select	11:28	0.00%	ppmd
20	root	1	-68	-187	0K	12K	WAIT	10:28	0.00%	irq10: em0 em1+++*
1490	root	1	96	0	11792K	4336K	select	9:44	0.00%	shm-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

## Release Information

Command introduced before Junos OS Release 7.4.

Option sfc introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Enhanced output regarding per CPU usage introduced in Junos OS Release 16.1R3 for Junos OS with upgraded FreeBSD.

## RELATED DOCUMENTATION

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## show system queues

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## 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>
```

## Description

Display queue statistics.

## Options

- |                          |   |
|--------------------------|---|
| <b>all-chassis</b>       | (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. |
| <b>all-lcc</b>           | (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.  |
| <b>all-members</b>       | (MX Series routers only) (Optional) Display system queue statistics for all members of the Virtual Chassis configuration.   |
| <b>lcc <i>number</i></b> | (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.

<b>local</b>	(MX Series routers only) (Optional) Display system queue statistics for the local Virtual Chassis member.
<b>member</b> <i>member-id</i>	(MX Series routers only) (Optional) Display system queue statistics for the specified member of the Virtual Chassis configuration. Replace <i>member-id</i> with a value of 0 or 1.
<b>scc</b>	(TX Matrix routers only) (Optional) Display queue statistics for the TX Matrix router.
<b>sfc number</b>	(TX Matrix Plus routers only) (Optional) Display system queue statistics for the TX Matrix Plus router. Replace <i>number</i> with 0.

Additional Information

By default, when you issue the `show system queues` command on the primary Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the primary 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

Output Fields

[Table 14 on page 344](#) lists the output fields for the `show system queues` command. Output fields are listed in the approximate order in which they appear.



**Table 14: show system queues Output Fields**

Field Name	Field Description
Output interface	<p>Interface on the device on which the queue exists:</p> <ul style="list-style-type: none"> <li>• fxp0—Management Ethernet interface.</li> <li>• fxp1—Internal Ethernet interface.</li> <li>• ipip, lsi, tap, mt, mtun, pimd, and pime—Internally generated interface and not configurable.</li> <li>• dsc—Discard interface.</li> <li>• em—Management and internal Ethernet interfaces.</li> <li>• gre—Internally generated interface that is configurable only as the control channel for Generalized MPLS (GMPLS).</li> <li>• ge—Gigabit Ethernet interface.</li> <li>• xe—10-Gigabit Ethernet interface.</li> <li>• lo—Loopback interface; the Junos OS automatically configures one loopback interface (lo0).</li> <li>• lsq—Link services IQ interface.</li> <li>• lt—Logical tunnel interface.</li> <li>• gr, ip, sp—Services interfaces.</li> <li>• irb—integrated routing and bridging interface.</li> <li>• vtep—Virtual Tunnel End Point (VTEP).</li> <li>• ppd and ppe—Interfaces used to enable a cluster to act as a rendezvous point (RP) or first hop router in the multicast domain.</li> </ul>
bytes	Number of bytes in the queue.
max	Maximum number of bytes allowed in the queue.

**Table 14: show system queues Output Fields (Continued)**

Field Name	Field Description
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

```

## 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.

## RELATED DOCUMENTATION

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## show system reboot

### IN THIS SECTION

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- [Syntax \(EX Series and MX Series\) | 346](#)
- [Syntax \(TX Matrix Router\) | 347](#)
- [Syntax \(TX Matrix Plus Router\) | 347](#)
- [Syntax \(QFX Series and OCX Series\) | 347](#)
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- [Release Information | 350](#)

### 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>
```

## Syntax (Junos OS Evolved)

```
show system reboot
```

## Description

Display pending system reboots or halts.

## Options

### none

Display pending reboots or halts on the active Routing Engine.

For Junos OS Evolved, the `show system reboot` command is applicable to all nodes (Routing Engines and FPCs). There is no system reboot command for a specific

Routing Engine. Hence, the `show system reboot` command shows the pending reboot for the system and not for a specific Routing Engine.

<b>all-chassis</b>	(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.
<b>all-members</b>	(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for all members of the Virtual Chassis configuration.
<b>all-lcc</b>	(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.
<b>both-routing-engines</b>	(Systems with multiple Routing Engines) (Optional) Display halt or reboot request information on both Routing Engines.
<b>infrastructure <i>name</i></b>	(QFabric systems only) (Optional) Display reboot request information on the fabric manager Routing Engines and fabric control Routing Engines.
<b>interconnect-device <i>name</i></b>	(QFabric systems only) (Optional) Display reboot request information on the Interconnect device.
<b><i>lcc number</i></b>	(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.

<b>local</b>	(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the local Virtual Chassis member.
<b>member</b> <i>member-id</i>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>node-group</b> <i>name</i>	(QFabric systems only) (Optional) Display reboot request information on the Node group.
<b>scc</b>	(TX Matrix router only) (Optional) Display halt or reboot request information for the TX Matrix router (or switch-card chassis).
<b>sfc</b>	(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 primary 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) primary 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.

For Junos OS Evolved, the `show system reboot` command is applicable to all nodes (Routing Engines and FPCs). There is no system reboot command for a specific Routing Engine. Hence, the `show system reboot` command shows the pending reboot for the system and not for a specific Routing Engine.

## Required Privilege Level

maintenance

## 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.
```

## 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.

## RELATED DOCUMENTATION

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## show system snapshot (Junos OS)

### IN THIS SECTION

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- [Syntax \(EX Series Switches\) | 351](#)
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- [Output Fields | 352](#)
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- [Release Information | 354](#)

### Syntax

```
show system snapshot
```

### Syntax (EX Series Switches)

```
show system snapshot  
<all-members | local | member member-id>  
<media (external | internal)>
```

### Description

This command displays information about the backup software:

- On the routers, this command display information about the backup software, which is located in the `/altroot`, and `/altconfig` file systems or on the alternate media.



- On the switches, this command 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.

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

Output Fields

Table 15 on page 352 lists the output fields for the `show system snapshot` command. Output fields are listed in the approximate order in which they appear.

Table 15: show system snapshot Output Fields

Field Name	Field Description
Creation date	Date and time of the last snapshot.

**Table 15: show system snapshot Output Fields (Continued)**

Field Name	Field Description
JUNOS version on snapshot	Junos OS release number of individual software packages.

## Sample Output

### show system snapshot (Router)

```

user@host> show system snapshot
Information for snapshot on hard-disk
Creation date: Oct 5 13:53:29 2005
JUNOS version on snapshot:
  jbase   : 7.3R2.5
  jcrypto: 7.3R2.5
  jdocs   : 7.3R2.5
  jkernel: 7.3R2.5
  jpfe    : M40-7.3R2.5
  jroute  : 7.3R2.5

```

### show system snapshot media external (Switch)

```

user@switch> show system snapshot media external
Information for snapshot on      external (/dev/das1a) (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/das2a) (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

```

## Release Information

Command introduced in Junos OS Release 7.6.

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](#).

## RELATED DOCUMENTATION

[request system snapshot \(Junos OS\) | 218](#)

## show system software

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### 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>
```

## Syntax (Junos OS Evolved)

```
show system software
<add-restart>
<list>
```

## Description

Display the Junos OS extensions loaded on your router or switch.

## Options

<b>none</b>	Display standard information about all loaded Junos OS extensions.
<b>add-restart</b>	(Junos OS Evolved only) (Optional) Display all console messages from the last in-service software upgrade (ISSU).
<b>all-chassis</b>	(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.
<b>all-lcc</b>	(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.
<b>all-members</b>	(EX4200 switches only) (Optional) Display the system software running on all members of the Virtual Chassis configuration.
<b>detail</b>	(Optional) Display detailed information about available Junos OS extensions.
<b>infrastructure name</b>	(QFabric systems only) (Optional) Display the system software running on the fabric control Routing Engine and the fabric manager Routing Engine.
<b>interconnect- device name</b>	(QFabric systems only) (Optional) Display the system software running on the Interconnect device.
<b>lcc number</b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>

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

<b>local</b>	(EX4200 switches only) (Optional) Display the system software running on the local Virtual Chassis member.
<b>member <i>member-id</i></b>	(EX4200 switches only) (Optional) Display the system software running on the specified member of the Virtual Chassis configuration. Replace <i>member-id</i> with a value from 0 through 9.
<b>node-group <i>name</i></b>	(QFabric systems only) (Optional) Display the system software running on the Node group.
<b>scc</b>	(Routing matrix only) (Optional) Display the system software running on a TX Matrix router (or switch-card chassis).
<b>sfc</b>	(TX Matrix Plus routers only) (Optional) Display system software information for the TX Matrix Plus router.

## Required Privilege Level

maintenance

## 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]

## 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.

## RELATED DOCUMENTATION

| [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)



## show system statistics

### IN THIS SECTION

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### 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
```

## 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

<b>all-chassis</b>	(TX Matrix and TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for all the routers in the chassis.
<b>all-lcc</b>	(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
<b>all-members</b>	(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 primary 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) primary 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

## 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 may headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 packets destined to dead next hop
0 option packets dropped due to rate limit
0 packets dropped (src and int don't match)
0 packets dropped due to bad protocol

icmp6:
0 calls to icmp_error
0 errors not generated because old message was icmp error or so
0 errors not generated because rate limitation
0 messages with bad code fields
0 messages < minimum length
0 bad checksums
0 messages with bad length
Histogram of error messages to be generated:
    0 no route
    0 administratively prohibited
    0 beyond scope
    0 address unreachable
    0 port unreachable
    0 packet too big
    0 time exceed transit
    0 time exceed reassembly
    0 erroneous header field
    0 unrecognized next header

```

```

        0 unrecognized option
        0 redirect
        0 unknown
0 message responses generated
0 messages with too many ND options
ipsec6:
    0 inbound packets processed successfully
    0 inbound packets violated process security policy
    0 inbound packets with no SA available
    0 invalid inbound packets
    0 inbound packets failed due to insufficient memory
    0 inbound packets failed getting SPI
    0 inbound packets failed on AH replay check
    0 inbound packets failed on ESP replay check
    0 inbound AH packets considered authentic
    0 inbound AH packets failed on authentication
    0 inbound ESP packets considered authentic
    0 inbound ESP packets failed on authentication
    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
crl:
    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 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 acknowledgment message send failures
    0 PSRM flow control messages sent
    0 PSRM flow control message send failures
    0 PSRM replication messages received
    0 PSRM replication message receive failures
    0 PSRM acknowledgment messages received
    0 PSRM acknowledgment message receive failures
    0 PSRM flow control messages received
    0 PSRM flow control message receive failures
    0 SRM messages with bad IPC type
    0 PSRM messages with no handler
    2 PSRM global state initializations
    1 PSRM global state cleanups
    0 PSRM per-socket state creations
    0 PSRM per-socket state creation failures
    0 PSRM per-socket state cleanups
    0 PSRM socket closes
    0 PSRM socket merges
    0 PSRM socket unreplicates
    0 PSRM primary socket replication initializations
    0 psrm-secondary-socket-replication-initializations
    0 PSRM primary socket replication activations
    0 secondary socket replication activations
    0 PSRM tcpcb updates
    0 PSRM buffer pullup failures
    73 PSRM tcp timestamp msg recv counters
    0 PSRM tcp timestamp msg recv failures
    0 PSRM tcp timestamp msg send counters
    0 PSRM tcp timestamp msg send failures
TCP:
    0 TCP out-of-order packets on JSR sockets
vpls:
    0 total packets received
    0 with size smaller than minimum
    0 with incorrect version number
    0 packets for this host
    0 packets with no logical interface

```

```

0 packets with no family
0 packets with no route table
0 packets with no auxiliary table
0 packets with no corefacing entry
0 packets with no CE-facing entry
0 mac route learning requests
0 mac routes learnt
0 requests to learn an existing route
0 learning requests while learning disabled on interface
0 learning requests over capacity
0 mac routes moved
0 requests to move static route
0 mac route aging requests
0 mac routes aged
0 bogus address in aging requests
0 requests to age static route
0 requests to re-ageout aged route
0 requests involving multiple peer FEs
0 aging acks from PFE
0 aging non-acks from PFE
0 aging requests timed out waiting on FEs
0 aging requests over max-rate
0 errors finding peer FEs

```

## Release Information

Command introduced before JUNOS Release 7.4.

sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.

## show system storage

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## 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

## 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>
```

## Description

Display statistics about the amount of free disk space in the router's or switch's file systems.

## Options

<b>none</b>	Display standard information about the amount of free disk space in the router's or switch's file systems.
<b>detail</b>	(Optional) Display detailed output.
<b>invoke-on all-routing-engines</b>	(Optional) Display the system storage information on all primary 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.
<b>invoke-on other-routing-engines</b>	(Optional) Display the system storage information on the other Routing Engine. For example, if you issue this command on the primary 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 primary Routing Engine, the JUNOS Software displays all the system storage information on all the backup Routing Engines.
<b>all-chassis</b>	(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system storage statistics for all the routers in the chassis.
<b>all-lcc</b>	(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.
<b>all-members</b>	(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for all members of the Virtual Chassis configuration.
<b>infrastructure <i>name</i></b>	(QFabric systems only) (Optional) Display system storage statistics for the fabric control Routing Engines or fabric manager Routing Engines.
<b>interconnect-device <i>name</i></b>	(QFabric systems only) (Optional) Display system storage statistics for the Interconnect device.
<b>lcc <i>number</i></b>	(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.

<b>local</b>	(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the local Virtual Chassis member.
<b>member <i>member-id</i></b>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>node</b>	(Junos OS Evolved only) (Optional) Display system storage statistics for the specified node.
<b>node-group <i>name</i></b>	(QFabric systems only) (Optional) Display system storage statistics for the Node group.
<b>scc</b>	(TX Matrix routers only) (Optional) Display system storage statistics for the TX Matrix router (or switch-card chassis).
<b>sfc <i>number</i></b>	(TX Matrix Plus routers only) (Optional) Display system storage statistics for the TX Matrix Plus router. Replace <i>number</i> with 0.

## Additional Information

By default, when you issue the `show system storage` command on the primary Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the primary 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

### Output Fields

Table 16 on page 382 describes the output fields for the `show system storage` command. Output fields are listed in the approximate order in which they appear.

**Table 16: 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)
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

Release Information

Command introduced before Junos OS Release 7.4.

sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.

Option invoke-on (all-routing-engines | other-routing-engine) introduced in Junos OS Release 14.1

node option introduced in Junos OS Evolved Release 18.3R1.

RELATED DOCUMENTATION

| [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

show system switchover

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## 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>
```

## 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 primary Routing Engine because the kernel-replication process daemon does not run on the primary 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 primary 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 primary Routing Engine of the TX Matrix router (or switch-card chassis), the CLI displays graceful switchover information for the primary 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 primary Routing Engine of a TX Matrix Plus router (or switch-fabric chassis), the CLI displays output for the primary 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.

<b>local</b>	(MX Series routers only) (Optional) Display graceful Routing Engines switchover information for all Routing Engines on the local Virtual Chassis member.
<b>member</b> <i>member-id</i>	(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 <i>member-id</i> with a value of 0 or 1.
<b>scc</b>	(TX Matrix router only) (Optional) Display graceful Routing Engine switchover information for the TX Matrix router (or switch-card chassis).
<b>sfc</b>	(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 primary 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

### Output Fields

[Table 17 on page 390](#) describes the output fields for the `show system switchover` command. Output fields are listed in the approximate order in which they appear.

**Table 17: 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"> <li>• On—Indicates graceful-switchover is specified for the routing-options configuration command.</li> <li>• Off—Indicates graceful-switchover is not specified for the routing-options configuration command.</li> </ul>
Configuration database	<p>State of the configuration database:</p> <ul style="list-style-type: none"> <li>• Ready—Configuration database has synchronized.</li> <li>• Synchronizing—Configuration database is synchronizing. Displayed when there are updates within the last 5 seconds.</li> <li>• Synchronize failed—Configuration database synchronize process failed.</li> </ul>
Kernel database	<p>State of the kernel database:</p> <ul style="list-style-type: none"> <li>• Ready—Kernel database has synchronized. This message implies that the system is ready for GRES.</li> <li>• Synchronizing—Kernel database is synchronizing. Displayed when there are updates within the last 5 seconds.</li> <li>• Version incompatible—The primary and standby Routing Engines are running incompatible kernel database versions.</li> <li>• Replication error—An error occurred when the state was replicated from the primary Routing Engine. Inspect <b>Steady State</b> for possible causes, or notify Juniper Networks customer support.</li> </ul>

**Table 17: show system switchover Output Fields (Continued)**

Field Name	Field Description
Peer state	<p>Routing Engine peer state:</p> <p>This field is displayed only when ksyncd is running in multichassis mode (LCC primary).</p> <ul style="list-style-type: none"> <li>• Steady State—Peer completed switchover transition.</li> <li>• Peer Connected—Peer in switchover transition.</li> </ul>
Switchover Status	<p>Switchover Status:</p> <ul style="list-style-type: none"> <li>• Ready—Message for system being switchover ready.</li> <li>• Not Ready—Message for system not being ready for switchover.</li> </ul>

## 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 primary role 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
```

## 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.

## RELATED DOCUMENTATION

| [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## show system uptime

### IN THIS SECTION

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## 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>
```

## 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

<b>none</b>	Show time since the system rebooted and processes started.
<b>all-chassis</b>	(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.
<b>all-lcc</b>	(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.
<b>all-members</b>	(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.

<b>director-group <i>name</i></b>	(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Director group.
<b>infrastructure <i>name</i></b>	(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the fabric control Routing Engine and fabric manager Routing Engine.
<b>interconnect- device <i>name</i></b>	(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Interconnect device.
<b>invoke-on</b>	(MX Series routers only) (Optional) Display the time since the system rebooted and processes started on the primary Routing Engine, backup Routing Engine, or both, on a router with two Routing Engines.
<b>lcc <i>number</i></b>	<p>(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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>local</b>	(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the local Virtual Chassis member.
<b>member <i>member-id</i></b>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>node <i>node-name</i></b>	(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 primary Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the primary 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

### Output Fields

[Table 18 on page 397](#) describes the output fields for the `show system uptime` command. Output fields are listed in the approximate order in which they appear.

**Table 18: 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.

**Table 18: show system uptime Output Fields (Continued)**

Field Name	Field Description
Current time	Current system time in UTC.
Time Source	Reference time source that the system is locked to.
System booted	Date and time when the Routing Engine on the router or switch was last booted and how long it has been running.
Protocols started	Date and time when the routing protocols were last started and how long they have been running.
Last configured	Date and time when a configuration was last committed. Also shows the name of the user who issued the last commit command.
<i>time</i> 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

## Release Information

Command introduced before Junos OS Release 7.4.

sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.

node option introduced in Junos OS Evolved Release 18.3R1.

## RELATED DOCUMENTATION

[10-Gigabit Ethernet LAN/WAN PIC with XFP \(T640 Router\)](#)

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## show system virtual-memory

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## 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>
```

### 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

<b>none</b>	Display kernel dynamic memory usage information.
<b>all-chassis</b>	(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for all chassis.
<b>all-lcc</b>	(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.
<b>all-members</b>	(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for all members of the Virtual Chassis configuration.
<b>infrastructure <i>name</i></b>	(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the fabric control Routing Engine and fabric manager Routing Engine.
<b>interconnect-device <i>name</i></b>	(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Interconnect device.

<b>lcc <i>number</i></b>	(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 <i>number</i> with the following values depending on the LCC configuration: <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>local</b>	(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the local Virtual Chassis member.
<b>member <i>member-id</i></b>	(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 <i>member-id</i> with a value from 0 through 9. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.
<b>node <i>node-name</i></b>	(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.
<b>node-group <i>name</i></b>	(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Node group.
<b>scc</b>	(TX Matrix routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix router (or switch-card chassis).
<b>sfc <i>number</i></b>	(TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix Plus router. Replace <i>number</i> with 0.

## Additional Information

By default, when you issue the `show system virtual-memory` command on the primary Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the primary 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.

`kernel direct memory map` only displays for the 64-bit platform.

### Required Privilege Level

view

### Output Fields

Table 19 on page 404 lists the output fields for the `show system virtual-memory` command. Output fields are listed in the approximate order in which they appear.

Table 19: 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.

**Table 19: show system virtual-memory Output Fields (Continued)**

Field Name	Field Description
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.
<b>Memory usage type by bucket size</b>	
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.
<b>Memory statistics by type</b>	
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 19: show system virtual-memory Output Fields (Continued)**

Field Name	Field Description
Size(s)	Memory block sizes this type is using.
<b>Memory Totals</b>	
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, rtnextthop
64  isadev, iftable, MFS node, allocindir, allocdirect, pagedep, temp,
    devbuf, lockf, COS, NULLFS hash, DEVFS name, vnodes,
    cluster_save buffer, vfscache, pcb, soname, proc-args, file,
    AR driver, AD driver, Gzip trees, rman, eventhandler, bus, sysctl,
    subproc, pfestat, pic, ifstate, pfe_ipc, mkey, ifaddr, rtable, ipfw
128 ZONE, freeblks, inodedep, temp, devbuf, zombie, COS, DEVFS node,
    vnodes, mount, vfscache, pcb, soname, proc-args, ttys, dev_t,
```



```

timecounter, kld, Gzip trees, ISOFS node, bus, uidinfo, cred,
session, pic, itable16, ifstate, pfe_ipc, rtable, ifstat, metrics,
rtnextthop, iffamilly
256 iflogical, iftable, MFS node, FFS node, newblk, temp, devbuf,
NFS daemon, vnodes, proc-args, kqueue, file desc, Gzip trees, bus,
subproc, itable16, ifstate, pfe_ipc, sysctl, rtnextthop
512 UFS mount, temp, devbuf, mount, BIO buffer, ptys, ttys, AR driver,
Gzip trees, ISOFS mount, msg, ioctllops, ATA generic, bus, proc,
pfestat, lr, ifstate, pfe_ipc, rtable, ipfw, ifstat, rtnextthop
1K iftable, temp, devbuf, NQNFS Lease, kqueue, kld, AD driver,
Gzip trees, sem, MD disk, bus, ifstate, pfe_ipc, ipfw
2K uc_devlist, UFS mount, temp, devbuf, BIO buffer, pcb, AR driver,
Gzip trees, ioctllops, bus, ipfw, ifstat, rcache
4K memdesc, iftable, UFS mount, temp, devbuf, kld, Gzip trees, sem, msg
8K temp, devbuf, syncache, Gzip trees
16K indirdep, temp, devbuf, shm, msg
32K pagedep, kld, Gzip trees
64K VM pgdata, devbuf, MSDOSFS mount
128K UFS ihash, inodedep, NFS hash, kld, ISOFS mount
256K mbuf, vfscache
512K SWAP

```

## Memory statistics by type

Type Kern

Type	InUse	MemUse	HighUse	Limit	Requests	Limit	Limit	Size(s)
isadev	13	1K	1K127753K	13	0	0	0	64
atkbddev	2	1K	1K127753K	2	0	0	0	32
uc_devlist	24	3K	3K127753K	24	0	0	0	16,2K
nexusdev	3	1K	1K127753K	3	0	0	0	16
memdesc	1	4K	4K127753K	1	0	0	0	4K
mbuf	1	152K	152K127753K	1	0	0	0	256K
iflogical	6	2K	2K127753K	6	0	0	0	256
iftable	17	9K	9K127753K	18	0	0	0	16,64,256,1K,4K
ZONE	15	2K	2K127753K	15	0	0	0	128
VM pgdata	1	64K	64K127753K	1	0	0	0	64K
UFS mount	12	26K	26K127753K	12	0	0	0	512,2K,4K
UFS ihash	1	128K	128K127753K	1	0	0	0	128K
MFS node	6	2K	3K127753K	35	0	0	0	64,256
FFS node	906	227K	227K127753K	1352	0	0	0	256
dirrem	0	0K	4K127753K	500	0	0	0	32
mkdir	0	0K	1K127753K	38	0	0	0	32
diradd	0	0K	6K127753K	521	0	0	0	32
freefile	0	0K	4K127753K	374	0	0	0	32
freeblks	0	0K	8K127753K	219	0	0	0	128

freefrag	0	0K	1K127753K	193	0	0	32
allocindir	0	0K	25K127753K	1518	0	0	64
indirdep	0	0K	17K127753K	76	0	0	32,16K
allocdirect	0	0K	10K127753K	760	0	0	64
bmsafemap	0	0K	1K127753K	72	0	0	32
newblk	1	1K	1K127753K	2279	0	0	32,256
inodedep	1	128K	175K127753K	2367	0	0	128,128K
pagedep	1	32K	33K127753K	47	0	0	64,32K
temp	1239	92K	96K127753K	8364	0	0	16,32,64K
devbuf	1413	5527K	5527K127753K	1535	0	0	16,32,64,128,256
lockf	38	3K	3K127753K	2906	0	0	64
atexit	1	1K	1K127753K	1	0	0	16
zombie	0	0K	2K127753K	3850	0	0	128
NFS hash	1	128K	128K127753K	1	0	0	128K
NQNFS Lease	1	1K	1K127753K	1	0	0	1K
NFS daemon	1	1K	1K127753K	1	0	0	256
syncache	1	8K	8K127753K	1	0	0	8K
COS	353	44K	44K127753K	353	0	0	16,32,64,128
BPF	189	3K	3K127753K	189	0	0	16
MSDOSFS mount	1	64K	64K127753K	1	0	0	64K
NULLFS hash	1	1K	1K127753K	1	0	0	64
DEVFS mount	2	1K	1K127753K	2	0	0	16
DEVFS name	487	31K	31K127753K	487	0	0	64
DEVFS node	471	58K	58K127753K	479	0	0	16,128
vnodes	28	7K	7K127753K	429	0	0	16,32,64,128,256
mount	15	8K	8K127753K	18	0	0	16,128,512
cluster_save buffer	0	0K	1K127753K	55	0	0	32,64
vfscache	1898	376K	376K127753K	3228	0	0	64,128,256K
BIO buffer	49	98K	398K127753K	495	0	0	512,2K
pcb	159	16K	17K127753K	399	0	0	16,32,64,128,2K
soname	82	10K	10K127753K	42847	0	0	16,32,64,128
proc-args	57	2K	3K127753K	2105	0	0	16,32,64,128,256
ptys	32	16K	16K127753K	32	0	0	512
ttys	254	33K	33K127753K	522	0	0	128,512
kqueue	5	3K	4K127753K	23	0	0	256,1K
sigio	1	1K	1K127753K	27	0	0	32
file	383	24K	24K127753K	16060	0	0	64
file desc	76	19K	20K127753K	3968	0	0	256
shm	1	12K	12K127753K	1	0	0	16K
dev_t	286	36K	36K127753K	286	0	0	128
timecounter	10	2K	2K127753K	10	0	0	128
kld	11	117K	122K127753K	34	0	0	16,32,128,1K,4K
AR driver	1	1K	3K127753K	5	0	0	64,512,2K

AD driver	2	2K	3K127753K	2755	0	0	64,1K
Gzip trees	0	0K	46K127753K	133848	0	0	32,64,128,256
ISOFS node	1136	142K	142K127753K	1189	0	0	128
ISOFS mount	9	132K	132K127753K	10	0	0	512,128K
sem	3	6K	6K127753K	3	0	0	1K,4K
MD disk	2	2K	2K127753K	2	0	0	16,1K
msg	4	25K	25K127753K	4	0	0	512,4K,16K
rman	59	4K	4K127753K	461	0	0	16,64
ioctlops	0	0K	2K127753K	992	0	0	512,2K
taskqueue	2	1K	1K127753K	2	0	0	32
SWAP	2	413K	413K127753K	2	0	0	32,512K
ATA generic	6	3K	3K127753K	6	0	0	16,512
eventhandler	17	1K	1K127753K	17	0	0	32,64
bus	340	30K	31K127753K	794	0	0	16,32,64,128,256
sysctl	0	0K	1K127753K	130262	0	0	16,32,64
uidinfo	4	1K	1K127753K	10	0	0	32,128
cred	22	3K	3K127753K	3450	0	0	128
subproc	156	10K	10K127753K	7882	0	0	32,64,256
proc	2	1K	1K127753K	2	0	0	512
session	12	2K	2K127753K	34	0	0	128
pgrp	16	1K	1K127753K	45	0	0	32
ippool	1	1K	1K127753K	1	0	0	16
pfestat	0	0K	1K127753K	47349	0	0	16,32,64,512
pic	5	1K	1K127753K	5	0	0	64,128
lr	1	1K	1K127753K	1	0	0	512
itable32	110	4K	4K127753K	110	0	0	32
itable16	161	26K	26K127753K	161	0	0	128,256
ifstate	694	159K	160K127753K	1735	0	0	16,32,64,128,1K
pfe_ipc	0	0K	1K127753K	56218	0	0	16,32,64,128,1K
mkey	250	4K	4K127753K	824	0	0	16,32,64
ifaddr	9	1K	1K127753K	9	0	0	64
sysctl	0	0K	1K127753K	30	0	0	256
rtable	49	6K	6K127753K	307	0	0	16,32,64,128,512
ifmaddr	22	1K	1K127753K	22	0	0	16,32
ipfw	23	10K	10K127753K	48	0	0	16,32,64,512,2K
ifstat	698	805K	805K127753K	698	0	0	128,512,2K
rcache	4	8K	8K127753K	4	0	0	2K
rnode	27	1K	1K127753K	285	0	0	16,32
metrics	1	1K	1K127753K	3	0	0	128
rtnexthop	57	9K	9K127753K	312	0	0	32,128,256,512
iffamily	12	2K	2K127753K	12	0	0	128

Memory Totals: In Use Free Requests

	9311K	54K	489068		
ITEM	SIZE	LIMIT	USED	FREE	REQUESTS
PIPE:	192,	0,	4,	81,	4422
SWAPMETA:	160,	95814,	0,	0,	0
unpcb:	160,	0,	114,	36,	279
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

```

## 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.

node option introduced in Junos OS Evolved Release 18.3R1.

## RELATED DOCUMENTATION

[Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## show task

### IN THIS SECTION

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## Syntax

```
show task
  <logical-system (all | logical-system-name)>
  <task-name>
  io
  logical-system-mux
  memory
  replication
  snooping
  summary
```

# Description

Display routing protocol tasks on the Routing Engine.

# Options

<b>none</b>	Display all routing protocol tasks on the Routing Engine.
<b>logical-system</b> (all   <i>logical-system-name</i> )	(Optional) Perform this operation on all logical systems or on a particular logical system.
<b>logical-system-mux</b>	Display the logical router multiplexer process (lrmuxd) per-task information.
<b>task-name</b>	(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 <code>show task BGP_Group</code> command).
<b>io</b>	Show i/o statistics for all tasks displayed.
<b>memory</b>	Show memory statistics for all tasks displayed.
<b>replication</b>	Show only replication tasks.
<b>snooping</b>	Show only snooping tasks.
<b>summary</b>	(Optional) Display summary information about running tasks.

# Required Privilege Level

view

# Output Fields

[Table 20 on page 414](#) describes the output fields for the `show task` command. Output fields are listed in the approximate order in which they appear.

**Table 20: show task Output Fields**

Field Name	Field Description
Pri	Current priority of the process. A lower number indicates a higher priority.

**Table 20: show task Output Fields (Continued)**

Field Name	Field Description
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"> <li>• Accept—Task is waiting for incoming connections.</li> <li>• Connect—Task is waiting for a connection to be completed.</li> <li>• Delete—Task has been deleted and is being cleaned up.</li> <li>• LowPrio— Task will be dispatched to read its socket after other higher-priority tasks.</li> </ul>

## 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+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}

Release Information

Command introduced before Junos OS Release 7.4.

RELATED DOCUMENTATION

<a href="#">show task io   416</a>
<a href="#">show task logical-system-mux   419</a>
<a href="#">show task memory   423</a>

show task io

IN THIS SECTION

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- [Syntax \(EX Series Switches\) | 417](#)
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## Syntax

```
show task io
<logical-system (all | logical-system-name)>
```

## Syntax (EX Series Switches)

```
show task io
```

## Description

Display I/O statistics for routing protocol tasks on the Routing Engine.

## Options

<b>none</b>	Display I/O statistics for routing protocol tasks on the Routing Engine.
<b>logical-system (all   <i>logical-system-name</i>)</b>	(Optional) Perform this operation on all logical systems or on a particular logical system.

## Required Privilege Level

view

## Output Fields

Table 21 on page 418 describes the output fields for the `show task io` command. Output fields are listed in the approximate order in which they appear.

**Table 21: show task io Output Fields**

Field Name	Field Description
Task Name	Name of the task.
Reads	Number of input ready notifications.
Writes	Number of output ready notifications.
Rcvd	Number of requests to the kernel for input.
Sent	Number of requests to the kernel for output.
Dropped	Number of sent requests that failed.

## Sample Output

### show task io

```
user@host> show task io
```

Task Name	Reads	Writes	Rcvd	Sent	Dropped
LMP Client	1	1	0	0	0
IF	0	0	0	0	0
INET6	0	0	0	0	0
INET	0	0	0	0	0
ISO	0	0	0	0	0
Memory	0	0	0	0	0
RPD Unix Domain Server./var/ru	0	0	0	0	0
RPD Unix Domain Server./var/ru	1	0	0	0	0
RPD Unix Domain Server./var/ru	2	0	0	0	0
RPD Server.0.0.0.0+666	0	0	0	0	0

Aggregate	0	0	0	0	0	
RT	0	0	0	0	0	
ICMP	0	0	0	0	0	
Router-Advertisement	0	0	0	0	0	
ICMPv6	0	0	0	0	0	
IS-IS I/O./var/run/ppmd_contro	1307	1	0	0	0	
l2vpn global task	0	0	0	0	0	
IS-IS	0	0	0	0	0	
BFD I/O./var/run/bfdd_control	1307	1	0	0	0	
TED	0	0	0	0	0	
ASPaths	0	0	0	0	0	
Resolve tree 1	0	0	0	0	0	
KStat	0	0	0	0	0	
KRT Request	0	0	63	0	0	
KRT Ifstate	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}
...						

## Release Information

Command introduced before Junos OS Release 7.4.

## show task logical-system-mux

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## Syntax

```
show task logical-system-mux <task-name>
    <io>
    <memory>
    <replication>
    <summary>
```

## 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

# Output Fields

Table 22 on page 421 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 22: 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"> <li>• Accept—Task is waiting for incoming connections.</li> <li>• Connect—Task is waiting for a connection to be completed.</li> <li>• Delete—Task has been deleted and is being cleaned up.</li> <li>• LowPrio— Task will be dispatched to read its socket after other higher-priority tasks.</li> </ul>

# 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:lr1	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_mgmt	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

## Release Information

Command introduced in Junos OS Release 13.3.

## RELATED DOCUMENTATION

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[show task memory | 423](#)

## show task memory

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### 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>
```

### 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

<b>none</b>	Display standard information about memory utilization for routing protocol tasks on the Routing Engine on all logical systems.
<b>brief   detail   history   summary</b>	(Optional) Display the specified level of output. Use the history option to display a history of memory utilization information.
<b>logical-system (all   <i>logical-system-name</i>)</b>	(Optional) Perform this operation on all logical systems or on a particular logical system.

# Required Privilege Level

view

# Output Fields

Table 23 on page 424 describes the output fields for the `show task memory` command. Output fields are listed in the approximate order in which they appear.

**Table 23: 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

Table 23: show task memory Output Fields (*Continued*)

Field Name	Field Description	Level of Output
Memory Available	<p>Memory currently available.</p> <p><b>NOTE:</b> 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).</p>	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 23: 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"> <li>• Size—Block size, in bytes.</li> <li>• TXP—T indicates transient memory, X indicates exclusive memory, and P indicates full page.</li> <li>• Allocs—Number of blocks allocated for named objects.</li> <li>• Mallocs—Number of blocks allocated for anonymous objects.</li> <li>• Alloc Bytes—Number of blocks allocated times block size.</li> <li>• MaxAllocs—Maximum value of Allocs.</li> <li>• MaxBytes—Maximum value of Alloc Bytes.</li> <li>• <i>FreeBytes</i>—Total number of bytes unused on memory pages for this block size.</li> </ul>	detail
Allocator Memory Report	<p>Memory utilization by named objects:</p> <ul style="list-style-type: none"> <li>• Size—Size of the named object in bytes.</li> <li>• Alloc Size—Actual memory used by that object in bytes.</li> <li>• DTXP—D indicates debug, T indicates transient memory, X indicates exclusive memory, and P indicates full page.</li> <li>• Alloc Blocks—Number of named objects allocated.</li> <li>• AllocBytes—Number of blocks allocated times block size.</li> <li>• MaxAlloc Blocks—Maximum value of Alloc Blocks.</li> <li>• Max Alloc Bytes—Maximum value of AllocBytes.</li> </ul>	detail

**Table 23: show task memory Output Fields (Continued)**

Field Name	Field Description	Level of Output
Malloc Usage Report	Memory utilization for miscellaneous use: <ul style="list-style-type: none"> <li>• Allocs—Number of allocations.</li> <li>• Bytes—Total bytes consumed.</li> <li>• MaxAllocs—Maximum value of Allocs.</li> <li>• MaxBytes—Maximum value of Bytes.</li> <li>• FuncCalls—Cumulative number of Allocs.</li> </ul>	detail
Dynamically allocated memory	Memory allocated dynamically by the system.	detail
Program data +BSS memory	Program and base station subsystem (BSS) memory.	detail
Page data overhead	Internal memory overhead.	detail
Page directory size	Internal memory overhead.	detail
Total bytes in use	Total memory, in bytes, that is currently in use and percentage of available memory (in parentheses).	detail

## Sample Output

### show task memory

```
user@host> show task memory
Memory          Size (kB)  Percentage  When
```

Currently In Use:	29417	3%	now
Maximum Ever Used:	33882	4%	00/02/11 22:07:03
Available:	756281	100%	now

show task memory detail

```
user@host> show task memory detail
----- Overall Memory Report -----
Size TP      Allocs  Mallocs  AllocBytes  MaxAllocs  MaxBytes  FreeBytes
   8         -      111      888        112        896      3208
  12         92      149     2892        247       2964     1204
 12 T         -       -        -         5         60        -
 16          7       11      288         23        368     3808
 20         100      33     2660        164       3280     1436
 20 T         -       -        -         40        800        -
 24         162      15     4248        177       4248     3944
 24 T         -       -        -          4         96        -
 28         371       -    10388        372      10416     1900
 32          6       23      928         30        960     3168
...
-----
                                606182                                715302      118810

----- Allocator Memory Report -----
Name                Size Alloc DTP   Alloc   Alloc MaxAlloc  MaxAlloc
                   Size      Blocks Bytes  Blocks  Bytes
patroot              8   12      84   1008    87   1044
sockaddr_un.i802     8   12        2    24     2    24
cos_nhm_nh           8   12        1    12     1    12
sockaddr_un.tag      8   12        3    36     4    48
gw_entry_list        8   12        1    12     1    12
bgp_riblist_01       8   12        1    12     2    24
ospf_intf_ev         8   12        -     -     6    72
krt_remnant_rt       8  12 T        -     -     5    60
...
-----
                                164108                                221552

----- Malloc Usage Report -----
Name                Allocs   Bytes MaxAllocs  MaxBytes  FuncCalls
MGMT.local              1        8         1         8         1
```

BGP.0.0.0.0+179	-	-	1	8	2
BGP RT Background	4	74748	4	74748	4
SNMP Subagent./var/run/	-	52	1	9172	56
OSPFv2 I/O./var/run/ppm	1	66536	2	66552	4551
OSPF	6	67655	7	67703	68
KRT	-	-	1	3784	18
ASPaths	3	80	3	80	3
-- sockaddr --	183	2100	184	2108	1645
BFD I/O./var/run/bfdd_c	1	65535	2	65551	4555
RT	48	872	48	872	48
Scheduler	42	628	43	628	88
--Anonymous--	56	1100	58	1140	112
--System--	82	58364	114	60044	4654
-----					
		337678		352398	
Dynamically allocated memory:	765952		Maximum:	765952	
Program data+BSS memory:	1568768		Maximum:	1568768	
Page data overhead:	53248		Maximum:	53248	
Page directory size:	4096		Maximum:	4096	
-----					
Total bytes in use:	2392064 (0% of available memory)				

## Release Information

Command introduced before Junos OS Release 7.4.

## show task replication

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## Syntax

```
show task replication
```

## Description

Displays nonstop active routing (NSR) status. When you issue this command on the primary 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 primary 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

## Output Fields

[Table 24 on page 431](#) lists the output fields for the `show task replication` command. Output fields are listed in the approximate order in which they appear.

**Table 24: 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 Primary 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 primary 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
```

## Release Information

Command introduced in Junos OS Release 8.5.

Support for logical systems introduced in Junos OS Release 13.3

## RELATED DOCUMENTATION

| *Example: Configuring Nonstop Active Routing on Switches*