



JUNOS® Software Guide for EX Series Ethernet Switches

**JUNOS® Software Guide for EX Series Ethernet Switches,
Release 9.6: Configuration and File Management**

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Part 1

JUNOS Software Configuration, Log, Temporary, and Crash Files

Chapter 1

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About This Topic Collection

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How to Use This Guide

Complete documentation for the EX Series product family is provided on web pages at http://www.juniper.net/techpubs/en_US/release-independent/information-products/pathway-pages/ex-series/product/index.html. We have selected content from these web pages and created a number of EX Series guides that collect related topics into a book-like format so that the information is easy to print and easy to download to your local computer.

This guide, *Complete Software Guide for JUNOS® Software for EX Series Switches, Release 9.6*, collects together the software feature descriptions, configuration examples, tasks, and reference pages for configuration statements and operational commands for the JUNOS Software for EX Series switches, Release 9.6. The release notes are at http://www.juniper.net/techpubs/en_US/junos9.6/information-products/topic-collections/release-notes/9.6/junos-release-notes-9.6.pdf.

List of EX Series Guides for JUNOS Release 9.6

Title	Description
<i>Complete Hardware Guide for EX3200 and EX4200 Ethernet Switches</i>	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX3200 and EX4200 switches
<i>Complete Hardware Guide for EX8208 Ethernet Switches</i>	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX8208 switches
<i>Complete Hardware Guide for EX8216 Ethernet Switches</i>	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX8216 switches





Title	Description
<i>Complete Software Guide for JUNOS® Software for EX Series Ethernet Switches, Release 9.6</i>	Software feature descriptions, configuration examples, and tasks for JUNOS Software for EX Series switches and reference pages for configuration statements and operational commands
Software Topic Collections	Software feature descriptions, configuration examples and tasks, and reference pages for configuration statements and operational commands. (This information also appears in the <i>Complete Software Guide for JUNOS® Software for EX Series Ethernet Switches, Release 9.6.</i>)
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Access Control</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Alarms and System Log Messages</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Configuration and File Management</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Class of Service</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Device Security</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Ethernet Switching</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Interfaces</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Layer 3 Protocols</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: MPLS</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Multicast</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Network Management and Monitoring</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Port Security</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Routing Policy and Packet Filtering</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Spanning-Tree Protocols</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: System Setup</i>	

Title	Description
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: User and Access Management</i>	
<i>JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Virtual Systems</i>	
<i>J-Web User Interface Guide for JUNOS Software for EX Series Ethernet Switches</i>	How to use the J-Web graphical user interface (GUI) with JUNOS Software for EX Series switches

Downloading Software

You can download the JUNOS Software for EX Series switches from the Download Software area at <http://www.juniper.net/customers/support/>. To download the software, you must have a Juniper Networks user account. For information about obtaining an account, see <http://www.juniper.net/entitlement/setupAccountInfo.do>.

Documentation Symbols Key

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

Text and Syntax Conventions		
Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active

Text and Syntax Conventions		
Convention	Description	Examples
<i>Italic text like this</i>	<ul style="list-style-type: none"> ■ Introduces important new terms. ■ Identifies book names. ■ Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> ■ A policy <i>term</i> is a named structure that defines match conditions and actions. ■ <i>JUNOS System Basics Configuration Guide</i> ■ RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> ■ To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. ■ The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (<i>string1</i> <i>string2</i> <i>string3</i>)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> ■ In the Logical Interfaces box, select All Interfaces. ■ To cancel the configuration, click Cancel.

Text and Syntax Conventions		
Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols > Ospf .

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- Document URL or title
- Page number if applicable
- Software version
- Your name and company

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- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
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Self-Help Online Tools and Resources

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- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>

- Search technical bulletins for relevant hardware and software notifications:
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- Join and participate in the Juniper Networks Community Forum:
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- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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Opening a Case with JTAC

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

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

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

Part 1

JUNOS Software Configuration, Log, Temporary, and Crash Files

- JUNOS Software Configuration, Log, Temporary, and Crash Files on page 3
- Managing Log, Temporary, and Crash Files on page 35
- Managing Password Changes on page 39

Chapter 1

JUNOS Software Configuration, Log, Temporary, and Crash Files

- JUNOS Software—Overview on page 3
- Configuration Files—Overview on page 14
- Managing Configuration Files on page 21

JUNOS Software—Overview

- EX Series Switch Software Features Overview on page 3
- Understanding Software Infrastructure and Processes on page 12

EX Series Switch Software Features Overview

Table 1 on page 3 lists the Juniper Networks EX Series Ethernet Switch software features and the Juniper Networks JUNOS Software release in which they were introduced.

Table 1: Summary of Software Features Available on EX Series Switches

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
Activity Logging and Monitoring	J-Web event view for system log messages	JUNOS 9.0R2	JUNOS 9.4R1
	Real-time performance monitoring (RPM)	JUNOS 9.3R2	Not supported
	System logging (syslog) over IPv4	JUNOS 9.0R2	JUNOS 9.4R1
	System logging (syslog) over IPv6	JUNOS 9.3R2	Not supported
	Traceroute tool in J-Web interface	JUNOS 9.0R2	JUNOS 9.4R1

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
Administration	Automatic software download	JUNOS 9.6R1	Not supported
	Configuration rollback	JUNOS 9.0R2	JUNOS 9.4R1
	Confirmation of configuration changes	JUNOS 9.0R2	JUNOS 9.4R1
	Software upgrades	JUNOS 9.0R2	JUNOS 9.4R1
	Support for RADIUS external administrator databases	JUNOS 9.0R2	JUNOS 9.4R1
	Supports the following features for automating network operations and troubleshooting: <ul style="list-style-type: none"> <li data-bbox="503 814 703 844">■ Commit scripts <li data-bbox="503 848 721 877">■ Operation scripts <li data-bbox="503 882 688 911">■ Event policies 	JUNOS 9.0R2	JUNOS 9.4R1
Encapsulation	802.1Q encapsulation tags	JUNOS 9.0R2	JUNOS 9.4R1
	802.1Q filtering and forwarding	JUNOS 9.0R2	JUNOS 9.4R1
	Ethernet:	JUNOS 9.0R2	JUNOS 9.4R1
	<ul style="list-style-type: none"> <li data-bbox="503 1098 964 1127">■ Media access control (MAC) encapsulation <li data-bbox="503 1131 699 1161">■ 802.1p tagging 		

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
High Availability and Resiliency	Graceful protocol restart for IS-IS	JUNOS 9.3R2	JUNOS 9.4R1
	Graceful protocol restart for OSPF and BGP	JUNOS 9.0R2	JUNOS 9.4R1
	Graceful Routing Engine switchover (GRES) for EX4200 Virtual Chassis configurations	JUNOS 9.1R1	Not applicable
	Graceful Routing Engine switchover (GRES) for ARP entries	JUNOS 9.2R1	JUNOS 9.4R1
	Graceful Routing Engine switchover (GRES) for the forwarding database	JUNOS 9.2R1	JUNOS 9.4R1
	Graceful Routing Engine switchover (GRES) for port security	JUNOS 9.2R1	JUNOS 9.6R1
	Link aggregation control protocol (LACP)	JUNOS 9.0R2	JUNOS 9.4R1
	Link aggregation groups (LAGs)	JUNOS 9.0R2	JUNOS 9.4R1
	Link aggregation groups (LAGs) over Virtual Chassis ports (VCPs)	JUNOS 9.6R1	Not applicable
	Redundant trunk groups	JUNOS 9.0R2	JUNOS 9.4R1
	Virtual Chassis <ul style="list-style-type: none"> ■ Atomic software upgrade ■ Fast failover ■ Split and merge 	JUNOS 9.3R2	Not applicable
	Virtual Chassis <ul style="list-style-type: none"> ■ Autoprovisioning of Virtual Chassis ports (VCPs) 	JUNOS 9.5R1	Not applicable
	Virtual Chassis support for SFP uplink module ports	JUNOS 9.2R1	Not applicable
	Virtual Router Redundancy Protocol (VRRP)	JUNOS 9.0R2	JUNOS 9.4R1
Interfaces	Power over Ethernet (PoE)	JUNOS 9.0R2	Not applicable
	VLAN-tagged Layer 3 subinterfaces	JUNOS 9.2R1	JUNOS 9.4R1
Internet Protocols	IPv4	JUNOS 9.0R2	JUNOS 9.4R1
	IPv6 (except multicast protocols)	JUNOS 9.3R2	Not supported
	A separate software license is required for IPv6. See Software Licenses for the EX Series Switch Overview.		

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
IP Address Management	DHCP server and relay with option 82 for Layer 2 VLANs	JUNOS 9.3R2	JUNOS 9.4R1
	DHCPv6 and IPv6 DNS	JUNOS 9.3R2	Not supported
	Dynamic Host Configuration Protocol (DHCP)	JUNOS 9.0R2	JUNOS 9.4R1
	Local DHCP server	JUNOS 9.3R2	JUNOS 9.4R1
	Static addresses	JUNOS 9.0R2	JUNOS 9.4R1
Layer 2 Network Protocols	BPDU protection for spanning-tree protocols	JUNOS 9.1R1	JUNOS 9.4R1
	Extended Q-in-Q VLAN support for multiple S-VLANs per access interface, firewall-filter-based VLAN assignment, and routed VLAN interfaces (RVIs)	JUNOS 9.6R1	Not supported
	GARP VLAN Registration Protocol (GVRP)	JUNOS 9.1R1	JUNOS 9.4R1
	Link Layer Discovery Protocol (LLDP)	JUNOS 9.0R2	JUNOS 9.4R1
	Link Layer Discovery Protocol-Media Endpoint Discovery (LLDP-MED) with voice over IP (VoIP) integration	JUNOS 9.0R2	Not supported
	Loop protection for spanning-tree protocols	JUNOS 9.1R1	JUNOS 9.4R1
	Private VLANs (PVLANS)	JUNOS 9.3R2	Not supported
	Q-in-Q tunneling	JUNOS 9.3R2	Not supported
	Root protection for spanning-tree protocols	JUNOS 9.1R1	JUNOS 9.4R1
	Routed VLAN interfaces (RVIs)	JUNOS 9.0R2	JUNOS 9.4R1
	Spanning tree: <ul style="list-style-type: none"> ■ Spanning Tree Protocol (STP) ■ Rapid Spanning Tree Protocol (RSTP) ■ Multiple Spanning Tree Protocol (MSTP) 	JUNOS 9.0R2	JUNOS 9.4R1
	Spanning tree: <ul style="list-style-type: none"> ■ VLAN Spanning Tree Protocol (VSTP) 	JUNOS 9.4R1	JUNOS 9.6R1
	Storm control	JUNOS 9.1R1	JUNOS 9.4R1
	Unknown Layer 2 unicast forwarding	JUNOS 9.3R2	Not supported
	Virtual routing and forwarding (VRF)—virtual routing instances	JUNOS 9.2R1	JUNOS 9.6R1
VLAN range	JUNOS 9.2R1	JUNOS 9.4R1	

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
Layer 3 Protocols	Bidirectional Forwarding Detection (BFD)	JUNOS 9.0R2	JUNOS 9.4R1
	Border Gateway Protocol (BGP)	JUNOS 9.0R2	JUNOS 9.4R1
	A separate software license is required for BGP and MBGP. See Software Licenses for the EX Series Switch Overview.		
	Intermediate System-to-Intermediate System (IS-IS)	JUNOS 9.0R2	JUNOS 9.4R1
	A separate software license is required for IS-IS. See Software Licenses for the EX Series Switch Overview.		
	IGMPv1 and IGMPv2	JUNOS 9.1R1	JUNOS 9.4R1
	IGMPv3	JUNOS 9.3R2	JUNOS 9.4R1
	Internet Group Management Protocol (IGMP)	JUNOS 9.0R2	JUNOS 9.4R1
	IPv6 protocols: Open Shortest Path First version 3 (OSPFv3), RIPng, IS-IS for IPv6, IPv6 BGP	JUNOS 9.3R2	Not supported
	Jumbo frames on routed VLAN interfaces (RVIs)	JUNOS 9.4R1	JUNOS 9.4R1
	Multicast Source Discovery Protocol (MSDP)	JUNOS 9.4R1	JUNOS 9.4R1
	See the <i>JUNOS Software Routing Protocols Guide</i> at http://www.juniper.net/techpubs/software/junos/junos96/index.html .		
	OSPF Multitopology Routing (MT-OSPF)	JUNOS 9.5R1	JUNOS 9.5R1
	See the <i>JUNOS Software Routing Protocols Guide</i> at http://www.juniper.net/techpubs/software/junos/junos96/index.html .		
	OSPFv2	JUNOS 9.0R2	JUNOS 9.4R1
	Protocol Independent Multicast dense mode (PIM DM)	JUNOS 9.2R1	JUNOS 9.4R1
See the <i>JUNOS Software Multicast Configuration Guide</i> at http://www.juniper.net/techpubs/software/junos/junos96/index.html .			
Protocol Independent Multicast source specific multicast (PIM SSM)	JUNOS 9.2R1	Not supported	
See the <i>JUNOS Software Multicast Configuration Guide</i> at http://www.juniper.net/techpubs/software/junos/junos96/index.html .			
Protocol Independent Multicast sparse mode (PIM SM)	JUNOS 9.0R2	JUNOS 9.4R1	
See the <i>JUNOS Software Multicast Configuration Guide</i> at http://www.juniper.net/techpubs/software/junos/junos96/index.html .			

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
	Routing Information Protocol version 1 (RIPv1) and RIPv2	JUNOS 9.0R2	JUNOS 9.4R1
	Single-source multicast	JUNOS 9.0R2	JUNOS 9.4R1
	Static routes	JUNOS 9.0R2	JUNOS 9.4R1
Multicast	IGMP snooping with routed VLAN interfaces (RVIs)	JUNOS 9.2R1	JUNOS 9.4R1
	IGMPv3 snooping	JUNOS 9.6R1	JUNOS 9.6R1
	Multicast VLAN registration (MVR)	JUNOS 9.6R1	Not supported
MPLS	MPLS with RSVP-based label switched paths (LSPs) and MPLS-based circuit cross-connects (CCCs)	JUNOS 9.5R1	Not supported
	A separate software license is required for MPLS. See Software Licenses for the EX Series Switch Overview.		

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
Network Management and Monitoring	Class of service (CoS)—Class-based queuing with prioritization	JUNOS 9.0R2	JUNOS 9.4R1
	Class of service (CoS)—DSCP, IEEE 801.p, and IP precedence packet rewrites are enabled on routed VLAN interfaces (RVIs).	JUNOS 9.5R1	Not supported
	Class of service (CoS)—Interface-specific classifiers on routed VLAN interfaces (RVIs)	JUNOS 9.4R1	Not supported
	Class of service (CoS) multidestination	Not applicable	JUNOS 9.5R1
	Class-of-service (CoS) support on LAGs	JUNOS 9.2R1	JUNOS 9.4R1
	Class-of-service (CoS) support on routed VLAN interfaces (RVIs)	JUNOS 9.4R1	JUNOS 9.4R1
	Ethernet OAM link fault management (LFM)	JUNOS 9.4R1	Not supported
	Interface-specific CoS rewrite rules	JUNOS 9.4R1	Not supported
	JUNOS EZQoS for CoS	JUNOS 9.3R2	JUNOS 9.4R1
	Policing	JUNOS 9.0R2	JUNOS 9.4R1
	Port shaping and queue shaping	JUNOS 9.3R2	Not supported
	Port mirroring	JUNOS 9.0R2	JUNOS 9.4R1
	Port mirroring enhancements <ul style="list-style-type: none"> ■ Multiple VLAN support ■ Layer 3 interface support 	JUNOS 9.5R1	JUNOS 9.5R1
	RMON	JUNOS 9.0R2	JUNOS 9.4R1
	Real-time performance monitoring (RPM)	JUNOS 9.3R2	Not supported
	sFlow monitoring technology	JUNOS 9.3R2	Not supported
	Simple Network Management Protocol version 1 (SNMPv1) and SNMPv2	JUNOS 9.0R2	JUNOS 9.4R1
Transparent bridging	JUNOS 9.0R2	JUNOS 9.4R1	

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
Security	802.1X authentication	JUNOS 9.0R2	Not supported
	Denial-of-service (DoS) and distributed DoS (DDoS) protection	JUNOS 9.0R2	JUNOS 9.4R1
	Dynamic firewall filters for 802.1X authentication	JUNOS 9.0R2	Not supported
	Filter-based forwarding	JUNOS 9.4R1	JUNOS 9.6R1
	Firewall filters and rate limiting	JUNOS 9.0R2	JUNOS 9.4R1
	Firewall filters on LAGs	JUNOS 9.0R2	Not supported
	Firewall filter on loopback interface	JUNOS 9.2R1	JUNOS 9.6R1
	Firewall filter processing points, additional	JUNOS 9.3R2	Not applicable
	Local proxy ARP	JUNOS 9.3R2	Not supported
	MAC-based VLAN	JUNOS 9.2R1	Not supported
	MAC RADIUS authentication	JUNOS 9.3R2	Not supported
	Port security: ■ DHCP option 82	JUNOS 9.3R2	Not supported
	Port security: ■ DHCP snooping ■ Dynamic ARP inspection (DAI) ■ MAC limiting ■ MAC move limiting	JUNOS 9.0R2	Not supported
	Port security: ■ IP source guard	JUNOS 9.2R1	Not supported
	Port security: ■ Persistent storage for DHCP snooping	JUNOS 9.4R1	Not supported
	Port security: ■ Static ARP support	JUNOS 9.0R2	JUNOS 9.4R1
	Port security and storm control: ■ Automatic recovery for port error disable conditions	JUNOS 9.6R1	Not supported
Server fail fallback	JUNOS 9.3R2	JUNOS 9.4R1	

Table 1: Summary of Software Features Available on EX Series Switches (continued)

Feature Category	Feature	First Release EX3200 and EX4200 Switches	First Release EX8200 Switches
	TACACS+	JUNOS 9.0R2	JUNOS 9.4R1
	Unicast reverse-path forwarding (RPF)	JUNOS 9.3R2	JUNOS 9.4R1
	Unrestricted proxy ARP	JUNOS 9.6R1	Not supported
System Management	Autoinstallation	JUNOS 9.4R1	Not supported
	IP directed broadcast	JUNOS 9.4R1	JUNOS 9.4R1
	JUNOS command-line interface (CLI)—For switch configuration and management through the console, Telnet, SSH, or J-Web CLI editor	JUNOS 9.0R2	JUNOS 9.4R1
	J-Web interface, for switch configuration and management	JUNOS 9.0R2	JUNOS 9.4R1
	J-Web interface enhancements: <ul style="list-style-type: none"> ■ The dashboard displays the DC power supply. ■ The Monitoring Chassis Information page displays details about the DC power supply. ■ The Virtual Chassis Monitoring page displays details of Virtual Chassis port (VCP) error and drop counts, VCP maximum bandwidth, and VCP actual bandwidth. 	JUNOS 9.4R1	Not applicable
	J-Web interface enhancements: <ul style="list-style-type: none"> ■ The Interface Configuration page displays details about port role configuration. ■ The Link Aggregation Configuration page supports aggregating interfaces with any speed setting. ■ Configuring spanning-tree protocols, GVRP, IGMP snooping, and redundant trunk groups is supported. ■ Monitoring Ethernet switching, spanning-tree protocols, GVRP, and IGMP snooping is supported. ■ Setting up real-time performance monitoring (RPM) and viewing monitoring results is supported. 	JUNOS 9.5R1	JUNOS 9.5R1
	J-Web license-management tool	JUNOS 9.1R1	JUNOS 9.4R1
	J-Web Port Troubleshooting tool	JUNOS 9.2R1	JUNOS 9.4R1
	Platform-specific JUNOS Software installation packages—EX Series switches have specific installation packages for each family of switches. Names of the installation packages include the switch family name.	JUNOS 9.4R1	JUNOS 9.4R1
	Power over Ethernet (PoE) power management mode	JUNOS 9.3R2	Not supported

- Related Topics**
- Features in JUNOS Software for EX-series Switches, Release 9.1
 - Features in JUNOS Software for EX-series Switches, Release 9.2
 - New Features in JUNOS Software for EX-series Switches, Release 9.3
 - New Features in JUNOS Software for EX-series Switches, Release 9.4
 - New Features in JUNOS Software for EX-series Switches, Release 9.5
 - New Features in JUNOS Release 9.6 for EX Series Switches
 - EX3200 and EX4200 Switches Hardware Overview
 - EX8208 Switch Hardware Overview
 - EX8216 Switch Hardware Overview
 - High Availability Features for EX Series Switches Overview
 - Layer 3 Protocols Supported on EX Series Switches
 - Layer 3 Protocols Not Supported on EX Series Switches

Understanding Software Infrastructure and Processes

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

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

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

- Routing Engine and Packet Forwarding Engine on page 12
- JUNOS Software Processes on page 13

Routing Engine and Packet Forwarding Engine

A switch has two primary software processing components:

- Packet Forwarding Engine—Processes packets; applies filters, routing policies, and other features; and forwards packets to the next hop along the route to their final destination.
- Routing Engine—Provides three main functions:
 - Creates the packet forwarding switch fabric for the switch, providing route lookup, filtering, and switching on incoming data packets, then directing outbound packets to the appropriate interface for transmission to the network

- Maintains the routing tables used by the switch and controls the routing protocols that run on the switch.
- Provides control and monitoring functions for the switch, including controlling power and monitoring system status.

JUNOS Software Processes

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

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

Table 2 on page 13 describes the primary JUNOS Software processes.

Table 2: JUNOS Software Processes

Process	Name	Description
Chassis process	chassisd	<p>Detects hardware on the system that is used to configure network interfaces.</p> <p>Monitors the physical status of hardware components and field-replaceable units (FRUs), detecting when environment sensors such as temperature sensors are triggered.</p> <p>Relays signals and interrupts—for example, when devices are taken offline, so that the system can close sessions and shut down gracefully.</p>
Ethernet switching process	eswd	<p>Handles Layer 2 switching functionality such as MAC address learning, Spanning Tree protocol and access port security. The process is also responsible for managing Ethernet switching interfaces, VLANs, and VLAN interfaces.</p> <p>Manages Ethernet switching interfaces, VLANs, and VLAN interfaces.</p>
Forwarding process	pfem	<p>Defines how routing protocols operate on the switch. The overall performance of the switch is largely determined by the effectiveness of the forwarding process.</p>
Interface process	dcd	<p>Configures and monitors network interfaces by defining physical characteristics such as link encapsulation, hold times, and keepalive timers.</p>
Management process	mgd	<p>Provides communication between the other processes and an interface to the configuration database.</p> <p>Populates the configuration database with configuration information and retrieves the information when queried by other processes to ensure that the system operates as configured.</p> <p>Interacts with the other processes when commands are issued through one of the user interfaces on the switch.</p> <p>If a process terminates or fails to start when called, the management process attempts to restart it a limited number of times to prevent thrashing and logs any failure information for further investigation.</p>

Table 2: JUNOS Software Processes (continued)

Process	Name	Description
Routing protocol process	rpd	Defines how routing protocols such as RIP, OSPF, and BGP operate on the device, including selecting routes and maintaining forwarding tables.
Related Topics		
	■	For more information about processes, see the <i>JUNOS Network Operations Guide</i> at http://www.juniper.net/techpubs/software/junos/junos90/index.html .
	■	For more information about basic system parameters, supported protocols, and software processes, see <i>JUNOS System Basics Configuration Guide</i> at http://www.juniper.net/techpubs/software/junos/junos94/index.html .

Configuration Files—Overview

- Understanding Configuration Files for EX Series Switches on page 14
- Configuration Files Terms on page 15
- EX3200 and EX4200 Default Configuration on page 15
- EX8200 Switch Default Configuration on page 20

Understanding Configuration Files for EX Series Switches

A configuration file stores the complete configuration of a switch. The current configuration of a switch is called the active configuration. You can alter this current configuration and you can also return to a previous configuration or to a rescue configuration. For more information, see “Configuration Files Terms” on page 15.

Juniper Networks JUNOS Software saves the 50 most recently committed configuration files on the switch so that you can return to a previous configuration. The configuration files are named:

- `juniper.conf.gz`—The current active configuration.
- `juniper.conf.1.gz` to `juniper.conf.49.gz`—Rollback configurations.

To make changes to the configuration file, you have to work in the configuration mode in the CLI or use the configuration tools in the J-Web interface. When making changes to a configuration file, you are viewing and changing the candidate configuration file. The candidate configuration allows you to make configuration changes without causing operational changes to the active configuration or causing potential damage to your current network operations. Once you commit the changes made to the candidate configuration, the system updates the active configuration.

- Related Topics**
- Managing Configuration Files Through the Configuration History (J-Web Procedure) on page 26
 - Uploading a Configuration File (CLI Procedure) on page 24
 - Uploading a Configuration File (J-Web Procedure) on page 25
 - Loading a Previous Configuration File (CLI Procedure) on page 29

- Reverting to the Rescue Configuration for the EX Series Switch on page 33
- Configuration Files Terms on page 15

Configuration Files Terms

Table 3 on page 15 lists the various configuration file terms used for EX Series switches and their definitions.

Table 3: Configuration File Terms

Term	Definition
active configuration	The current committed configuration of a switch.
candidate configuration	A working copy of the configuration that allows users to make configurational changes without causing any operational changes until this copy is committed.
configuration group	Group of configuration statements that can be inherited by the rest of the configuration.
commit a configuration	Have the candidate configuration checked for proper syntax, activated, and marked as the current configuration file running on the switching platform.
configuration hierarchy	The JUNOS Software configuration consists of a hierarchy of statements. There are two types of statements: container statements, which contain other statements, and leaf statements, which do not contain other statements. All the container and leaf statements together form the configuration hierarchy.
default configuration	The default configuration contains the initial values set for each configuration parameter when a switch is shipped.
rescue configuration	Well-known configuration that recovers a switch from a configuration that denies management access. You set a current committed configuration to be the rescue configuration through the J-Web interface or CLI.
roll back a configuration	Return to a previously committed configuration.

- Related Topics**
- EX3200 and EX4200 Default Configuration on page 15
 - EX8200 Switch Default Configuration on page 20
 - Loading a Previous Configuration File (CLI Procedure) on page 29
 - Managing Configuration Files Through the Configuration History (J-Web Procedure) on page 26
 - Reverting to the Rescue Configuration for the EX Series Switch on page 33
 - Understanding Configuration Files for EX Series Switches on page 14

EX3200 and EX4200 Default Configuration

Each EX Series switch is programmed with a factory default configuration that contains the values set for each configuration parameter when a switch is shipped. The default configuration file sets values for system parameters such as syslog and

commit, configures Power over Ethernet and Ethernet switching on all interfaces, and enables the LLDP and RSTP protocols.

The following factory default configuration file is for a 24-port switch. For models that have more ports, this default configuration file has more interfaces.



NOTE: In this example, `ge-0/0/0` through `ge-0/0/23` are the network interface ports. Optional uplink modules provide either two 10-gigabit small form-factor pluggable (XFP) transceivers (`xe-0/1/0` and `xe-0/1/1`) or four 1-gigabit small form-factor pluggable (SFP) transceivers (`ge-0/1/0` through `ge-0/1/3`). Although you can install only one uplink module, the interfaces for both are shown below.

When you commit changes to the configuration, a new configuration file is created which becomes the active configuration. You can always revert to the factory default configuration.

This topic shows the factory default configuration file of a 24-port EX3200 or EX4200 switch:

```
system {
  syslog {
    user * {
      any emergency;
    }
    file messages {
      any notice;
      authorization info;
    }
    file interactive-commands {
      interactive-commands any;
    }
  }
  commit {
    factory-settings {
      reset-chassis-lcd-menu;
      reset-virtual-chassis-configuration;
    }
  }
}
interfaces {
  ge-0/0/0 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/1 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/2 {
    unit 0 {
      family ethernet-switching;
    }
  }
}
```

```
    }  
  }  
  ge-0/0/3 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/4 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/5 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/6 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/7 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/8 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/9 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/10 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/11 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/12 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }  
  ge-0/0/13 {  
    unit 0 {  
      family ethernet-switching;  
    }  
  }
```

```
}
ge-0/0/14 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/15 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/16 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/17 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/18 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/19 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/20 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/21 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/22 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/0/23 {
  unit 0 {
    family ethernet-switching;
  }
}
xe-0/1/0 {
  unit 0 {
    family ethernet-switching;
  }
}
```

```

xe-0/1/1 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/1/0 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/1/1 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/1/2 {
  unit 0 {
    family ethernet-switching;
  }
}
ge-0/1/3 {
  unit 0 {
    family ethernet-switching;
  }
}
}
protocols {
  igmp-snooping {
    vlan all;
  }
  lldp {
    interface all;
  }
  lldp-med {
    interface all;
  }
  rstp;
}
ethernet-switching-options {
  storm-control {
    interface all {
      level 50;
    }
  }
}
}
poe {
  interface all;
}
}

```

- Related Topics**
- Reverting to the Default Factory Configuration for the EX Series Switch on page 30
 - Connecting and Configuring an EX Series Switch (CLI Procedure)
 - Connecting and Configuring an EX Series Switch (J-Web Procedure)

- Understanding Configuration Files for EX Series Switches on page 14
- EX Series Switches Interfaces Overview

EX8200 Switch Default Configuration

Each EX8200 switch is programmed with a factory default configuration that contains the values set for each configuration parameter when a switch is shipped. The default configuration file sets values for system parameters such as system log and file messages, and enables the LLDP and RSTP protocols.

When you commit changes to the configuration, a new configuration file is created that becomes the active configuration. You can always revert to the factory default configuration.

This topic shows the factory default configuration file of an EX8200 switch:

```

system {
  arp {
    aging-timer {
      5;
    }
  }
  syslog {
    user * {
      any emergency;
    }
    file messages {
      any notice;
      authorization info;
    }
    file interactive-commands {
      interactive-commands any;
    }
  }
  commit {
    factory-settings {
      reset-chassis-lcd-menu;
    }
  }
}
protocols {
  igmp-snooping {
    vlan all;
  }
  lldp {
    interface all;
  }
  rstp;
}
ethernet-switching-options {
  storm-control {
    interface all {
      level 50;
    }
  }
}

```

```

    }
  }
}

```

- Related Topics**
- Configuration Files Terms on page 15
 - Connecting and Configuring an EX Series Switch (CLI Procedure)
 - Connecting and Configuring an EX Series Switch (J-Web Procedure)
 - Understanding Configuration Files for EX Series Switches on page 14
 - EX8208 Switch Hardware Overview

Managing Configuration Files

- Using the CLI Viewer in the J-Web Interface to View Configuration Text on page 21
- Using the CLI Editor in the J-Web Interface to Edit Configuration Text on page 22
- Using the Point and Click CLI Tool in the J-Web Interface to Edit Configuration Text on page 22
- Uploading a Configuration File (CLI Procedure) on page 24
- Uploading a Configuration File (J-Web Procedure) on page 25
- Managing Configuration Files Through the Configuration History (J-Web Procedure) on page 26
- Loading a Previous Configuration File (CLI Procedure) on page 29
- Reverting to the Default Factory Configuration for the EX Series Switch on page 30
- Setting or Deleting the Rescue Configuration (CLI Procedure) on page 32
- Setting or Deleting the Rescue Configuration (J-Web Procedure) on page 32
- Reverting to the Rescue Configuration for the EX Series Switch on page 33

Using the CLI Viewer in the J-Web Interface to View Configuration Text

To view the entire configuration file contents in text format, select **Configure>CLI Tools >CLI Viewer**. The main pane displays the configuration in text format.

Each level in the hierarchy is indented to indicate each statement's relative position in the hierarchy. Each level is generally set off with braces, with an open brace (`{`) at the beginning of each hierarchy level and a closing brace (`}`) at the end. If the statement at a hierarchy level is empty, the braces are not displayed. Each leaf statement ends with a semicolon (`;`), as does the last statement in the hierarchy.

This indented representation is used when the configuration is displayed or saved as an ASCII file. However, when you load an ASCII configuration file, the format of the file is not so strict. The braces and semicolons are required, but the indention and use of new lines are not required in ASCII configuration files.

Related Topics ■ Understanding J-Web Configuration Tools

Using the CLI Editor in the J-Web Interface to Edit Configuration Text

Use the CLI Editor to edit configuration if you know the JUNOS CLI or prefer a command interface.

To edit the entire configuration in text format:



CAUTION: We recommend that you use this method to edit and commit the configuration only if you have experience editing configurations through the CLI.

1. Select **Configure>CLI Tools>CLI Editor**. The main pane displays the configuration in a text editor.
2. Navigate to the hierarchy level you want to edit.

You can edit the candidate configuration using standard text editor operations—insert lines (by using the Enter key), delete lines, and modify, copy, and paste text.

3. Click **Commit** to load and commit the configuration.

The switching platform checks the configuration for the correct syntax before committing it.

Related Topics ■ CLI User Interface Overview
 ■ Understanding J-Web Configuration Tools

Using the Point and Click CLI Tool in the J-Web Interface to Edit Configuration Text

To edit the configuration on a series of pages of clickable options that steps you through the hierarchy, select **Configure>CLI Tools>Point&Click CLI**. The side pane displays the top level of the configured hierarchy, and the main pane displays configured hierarchy options and the Icon Legend.

To expand or hide the hierarchy of all the statements in the side pane, click **Expand all** or **Hide all**. To expand or hide an individual statement in the hierarchy, click the expand (+) or collapse (-) icon to the left of the statement.



TIP: Only those statements included in the committed configuration are displayed in the hierarchy.

The configuration information in the main pane consists of configuration options that correspond to configuration statements. Configuration options that contain subordinate statements are identified by the term *Nested*.

To include, edit, or delete statements in the candidate configuration, click one of the links described in Table 4 on page 23. Then specify configuration information by typing in a field, selecting a value from a list, or clicking a check box (toggle).

Table 4: J-Web Edit Point & Click Configuration Links

Link	Function
Add new entry	Displays fields and lists for a statement identifier, allowing you to add a new identifier to a statement.
Configure	Displays information for a configuration option that has not been configured, allowing you to include a statement.
Delete	Deletes the corresponding statement or identifier from the configuration. All subordinate statements and identifiers contained within a deleted statement are also discarded.
Edit	Displays information for a configuration option that has already been configured, allowing you to edit a statement.
Identifier	Displays fields and lists for an existing statement identifier, allowing you to edit the identifier.

As you navigate through the configuration, the hierarchy level is displayed at the top of the main pane. You can click a statement or identifier in the hierarchy to display the corresponding configuration options in the main pane.

The main pane includes icons that display information about statements and identifiers when you place your cursor over them. Table 5 on page 23 describes these icons.

Table 5: J-Web Edit Point & Click Configuration Icons

Icon	Function
C	Displays a comment about a statement.
I	Indicates that a statement is inactive.
M	Indicates that a statement has been added or modified but has not been committed.
*	Indicates that the statement or identifier is required in the configuration.
?	Provides online help information.

After typing or selecting your configuration edits, click a button in the main pane (described in Table 6 on page 24) to apply your changes or cancel them, refresh the display, or discard parts of the candidate configuration. An updated configuration does not take effect until you commit it.

Table 6: J-Web Edit Point & Click Configuration Buttons

Button	Function
Refresh	Updates the display with any changes to the configuration made by other users.
Commit	Verifies edits and applies them to the current configuration file running on the switch.
Discard	Removes edits applied to or deletes existing statements or identifiers from the candidate configuration.

- Related Topics**
- CLI User Interface Overview
 - Understanding J-Web Configuration Tools

Uploading a Configuration File (CLI Procedure)

You can create a configuration file on your local system, copy the file to the EX Series switch and then load the file into the CLI. After you have loaded the configuration file, you can commit it to activate the configuration on the switch. You can also edit the configuration interactively using the CLI and commit it at a later time.

To upload a configuration file from your local system:

1. Create the configuration file using a text editor such as Notepad, making sure that the syntax of the configuration file is correct. For more information about testing the syntax of a configuration file see *JUNOS Software System Basics and Services Command Reference* at <http://www.juniper.net/techpubs/software/junos/>.
2. In the configuration text file, use an option to perform the required action when the file is loaded. Table 7 on page 24 lists and describes some options for the `load` command.

Table 7: Options for the load command

Options	Description
merge	Combines the current active configuration and the configuration in <i>filename</i> or the one that you type at the terminal. A merge operation is useful when you are adding a new section to an existing configuration. If the active configuration and the incoming configuration contain conflicting statements, the statements in the incoming configuration override those in the active configuration.
override	Discards the current candidate configuration and loads the configuration in <i>filename</i> or the one that you type at the terminal. When you use the override option and commit the configuration, all system processes reparse the configuration. You can use the override option at any level of the hierarchy.
replace	Searches for the replace tags, deletes the existing statements of the same name, if any, and replaces them with the incoming configuration. If there is no existing statement of the same name, the replace operation adds the statements marked with the replace tag to the active configuration. NOTE: For this operation to work, you must include replace tags in the text file or in the configuration you type at the terminal.

3. Press Ctrl + A to select all the text in the configuration file.
4. Press Ctrl + C to copy the contents of the configuration text file to the Clipboard.
5. Log in to the switch using your username and password.
6. To enter configuration mode:
user@switch> configure

You will see this output, with the hash or pound mark indicating configuration mode.

```
Entering configuration mode
[edit]
user@switch#
```

7. Load the configuration file:
[edit]
user@switch# load merge terminal
8. At the cursor, paste the contents of the Clipboard using the mouse and the Paste icon:
[edit]
user@switch# load merge terminal
[Type ^D at a new line to end input]
>Cursor is here. Paste the contents of the clipboard here<
9. Press Enter.
10. Press Ctrl + D to set the end-of-file marker.

To view results of the configuration steps before committing the configuration, type the `show` command at the user prompt.

To commit these changes to the active configuration, type the `commit` command at the user prompt. You can also edit the configuration interactively using the CLI and commit it at a later time.

- Related Topics**
- Uploading a Configuration File (J-Web Procedure) on page 25
 - Understanding Configuration Files for EX Series Switches on page 14

Uploading a Configuration File (J-Web Procedure)

You can create a configuration file on your local system, copy the file to the EX Series switch and then load the file into the CLI. After you have loaded the configuration file, you can commit it to activate the configuration on the switch. You can also edit the configuration interactively using the CLI and commit it at a later time.

To upload a configuration file from your local system:

1. Select **Maintain > Config Management > Upload**.

The main pane displays the File to Upload box.
2. Specify the name of the file to upload using one of the following methods:
 - Type the absolute path and filename in the File to Upload box.

- Click **Browse** to navigate to the file.
3. Click **Upload and Commit** to upload and commit the configuration.

The switch checks the configuration for the correct syntax before committing it.

- Related Topics**
- [Uploading a Configuration File \(CLI Procedure\) on page 24](#)
 - [Understanding J-Web Configuration Tools](#)
 - [Understanding Configuration Files for EX Series Switches on page 14](#)

Managing Configuration Files Through the Configuration History (J-Web Procedure)

Use the Configuration History function to manage configuration files.

1. [Displaying Configuration History on page 26](#)
2. [Displaying Users Editing the Configuration on page 27](#)
3. [Comparing Configuration Files with the J-Web Interface on page 28](#)
4. [Downloading a Configuration File with the J-Web Interface on page 28](#)
5. [Loading a Previous Configuration File with the J-Web Interface on page 28](#)

Displaying Configuration History

To manage configuration files with the J-Web interface, select **Maintain > Config Management > History**. The main pane displays History — Database Information page.

Table 8 on page 26 summarizes the contents of the display.

The configuration history display allows you to:

- View a configuration.
- Compare two configurations.
- Download a configuration file to your local system.
- Roll back the configuration to any of the previous versions stored on the switch.

Table 8: J-Web Configuration History Summary

Field	Description
Number	Version of the configuration file.
Date/Time	Date and time the configuration was committed.
User	Name of the user who committed the configuration.

Table 8: J-Web Configuration History Summary (continued)

Field	Description
Client	Method by which the configuration was committed: <ul style="list-style-type: none"> ■ cli—A user entered a JUNOS CLI command. ■ junoscript—A JUNOScript client performed the operation. Commit operations performed by users through the J-Web interface are identified in this way. ■ snmp—An SNMP set request started the operation. ■ other—Another method was used to commit the configuration.
Comment	Comment.
Log Message	Method used to edit the configuration: <ul style="list-style-type: none"> ■ Imported via paste— Configuration was edited and loaded with the Configure > CLI Tools > Edit Configuration Text option. ■ Imported upload [filename]—Configuration was uploaded with the Configure>CLI Tools>Point Click Editor option. ■ Modified via J-Web Configure — Configuration was modified with the J-Web Configure menu. ■ Rolled back via <i>user-interface</i>— Configuration was rolled back to a previous version through the user interface specified by <i>user-interface</i>, which can be Web Interface or CLI.
Action	Action to perform with the configuration file. The action can be Download or Rollback.

Displaying Users Editing the Configuration

To display a list of users editing the switching platform configuration, select **Config Management > History**. The list is displayed as Database Information in the main pane. Table 9 on page 27 summarizes the Database Information display.

Table 9: J-Web Configuration Database Information Summary

Field	Description
User Name	Name of user editing the configuration.
Start Time	Time of day the user logged in to the switch.
Idle Time	Elapsed time since the user issued a configuration command from the CLI.
Terminal	Terminal on which the user is logged in.
PID	Process identifier assigned to the user by the switching platform.
Edit Flags	Designates a private or exclusive edit.
Edit Path	Level of the configuration hierarchy that the user is editing.

Comparing Configuration Files with the J-Web Interface

To compare any two of the past 50 committed configuration files:

1. Select **Config Management >History**. A list of the current and the previous 49 configurations is displayed as Configuration History in the main pane.
2. Select the check boxes to the left of the two configuration versions you want to compare.
3. Click **Compare**.

The main pane displays the differences between the two configuration files at each hierarchy level as follows:

- Lines that have changed are highlighted side by side in green.
- Lines that exist only in the more recent configuration file are displayed in red on the left.
- Lines that exist only in the older configuration file are displayed in blue on the right.

Downloading a Configuration File with the J-Web Interface

To download a configuration file from the switch to your local system:

1. Select **Config Management >History**. A list of current and previous 49 configurations is displayed as Configuration History in the main pane.
2. In the Action column, click **Download** for the version of the configuration you want to download.
3. Select the options your Web browser provides that allow you to save the configuration file to a target directory on your local system.

The file is saved as an ASCII file.

Loading a Previous Configuration File with the J-Web Interface

To load (roll back) and commit a previous configuration file stored on the switching platform:

1. Select **Config Management >History**. A list of current and previous 49 configurations is displayed as Configuration History in the main pane.
2. In the Action column, click **Rollback** for the version of the configuration you want to load.

The main pane displays the results of the rollback operation.



NOTE: When you click **Rollback**, the switch loads and commits the selected configuration. This behavior is different from the switch's behavior that occurs after you enter the **rollback** configuration mode command from the CLI. In the latter case, the configuration is loaded but not committed.

- Related Topics**
- Loading a Previous Configuration File (CLI Procedure) on page 29
 - Understanding Configuration Files for EX Series Switches on page 14
 - Understanding J-Web Configuration Tools

Loading a Previous Configuration File (CLI Procedure)

You can return to a previously committed configuration file if you need to revert to a previous configuration. The EX Series switch saves the last 50 committed configurations, including the rollback number, date, time, and name of the user who issued the **commit** configuration command.

Syntax

```
rollback < number >
```

Options

- **none**— Return to the most recently saved configuration.
- **number**—Configuration to return to.
 - **Range:** 0 through 49. The most recently saved configuration is number 0, and the oldest saved configuration is number 49.
 - **Default:** 0

To return to a configuration prior to the most recently committed one:

1. Specify the rollback number (here, 1 is entered and the configuration returns to the previously committed configuration):

```
[edit]
user@switch# rollback 1
load complete
```

2. Activate the configuration you have loaded:

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

- Related Topics**
- Managing Configuration Files Through the Configuration History (J-Web Procedure) on page 26
 - Configuration Files Terms on page 15

- For more information on rollback, see the *JUNOS Software CLI User Guide* at <http://www.juniper.net/techpubs/software/junos/junos94/index.html> .

Reverting to the Default Factory Configuration for the EX Series Switch

If for any reason the current active configuration fails, you can revert to the default factory configuration. You can also roll back to a previous configuration, as described in “Loading a Previous Configuration File (CLI Procedure)” on page 29, or revert to the rescue configuration, as described in “Reverting to the Rescue Configuration for the EX Series Switch” on page 33.

The default factory configuration contains the basic configuration settings. This is the first configuration of the switch and it is loaded when the switch is first installed and powered on.

You can revert to the default factory configuration by using the **Menu** button to the right of the LCD on the front panel of the switch or by using the `load factory default` configuration command.

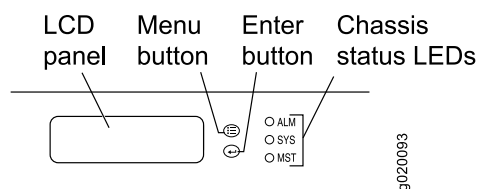
- Reverting to the Default Factory Configuration by Using the LCD Panel on page 30
- Reverting to the Default Factory Configuration by Using the Load Factory Default Command on page 31

Reverting to the Default Factory Configuration by Using the LCD Panel

To set the switch to the default factory configuration, use the LCD panel and buttons on the front panel of the switch as shown in Figure 1 on page 30

Use the LCD panel to revert to the default factory configuration if you want to run EZsetup. When you use the CLI to revert to the default factory configuration, the configuration for the root password is retained and you cannot run EZSetup.

Figure 1: EX Series Switch LCD Panel



NOTE: If you want to convert an EX4200 switch from a member of a multimember Virtual Chassis configuration to a standalone switch, first disconnect the cables connected to the Virtual Chassis ports (VCPs). See *Disconnecting a Virtual Chassis Cable from an EX4200 Switch*. The **Menu** button procedure deletes all modified configuration parameters, including Virtual Chassis parameters such as member ID, mastership priority, and setting of VCP uplinks.

1. Press the **Menu** button until you see MAINTENANCE MENU on the panel.
2. Press the **Enter** button.
3. Press **Menu** until you see FACTORY DEFAULT.
4. Press **Enter**. The display says RESTORE DEFAULT?
5. Press **Enter**. The screen flashes FACTORY DEFAULT IN PROGRESS and returns to the idle menu.

Reverting to the Default Factory Configuration by Using the Load Factory Default Command

The `load factory default` command is a standard JUNOS configuration command. This configuration command replaces the current active configuration with the default factory configuration.

Use the LCD panel to revert to the default factory configuration if you want to run EZsetup. When you use the CLI to revert to the default factory configuration, the configuration for the root password is retained and you cannot run EZSetup.



NOTE: The `load factory default` command by itself is not supported on EX4200 switches configured in a Virtual Chassis with multiple members. In a multimember Virtual Chassis configuration, you can revert to the default factory configuration while retaining the Virtual Chassis parameters (member ID, mastership priority, or settings of VCP uplinks) using the following procedure:

1. [edit]
user@switch# **load factory default**
2. [edit]
user@switch# **delete system commit factory-settings**
3. [edit]
user@switch# **commit**
4. Check the member ID and mastership priority with the `show virtual-chassis status` command and check to see whether there are remaining settings for uplink VCPs by using the `show virtual-chassis vc-port` command.

-
- Related Topics**
- Configuring a Virtual Chassis (CLI Procedure)
 - EX3200 and EX4200 Default Configuration on page 15
 - EX8200 Switch Default Configuration on page 20
 - Understanding Configuration Files for EX Series Switches on page 14
 - For more information about the `load factory default` command see the *JUNOS Software CLI User Guide* at <http://www.juniper.net/techpubs/software/junos/junos94/index.html>.

Setting or Deleting the Rescue Configuration (CLI Procedure)

A rescue configuration is a well-known configuration that recovers a switch from a configuration that denies management access. You set a current committed configuration to be the rescue configuration through the J-Web interface or CLI.

If someone inadvertently commits a configuration that denies management access to an EX Series switch and the console port is not accessible, you can overwrite the invalid configuration and replace it with the rescue configuration by using the LCD panel on the switch. The rescue configuration is a previously committed, valid configuration. We recommend that the rescue configuration include the IP address (accessible from the network) for the management port.

To set the current active configuration as the rescue configuration:

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

To delete an existing rescue configuration:

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

Related Topics

- Setting or Deleting the Rescue Configuration (J-Web Procedure) on page 32
- Reverting to the Rescue Configuration for the EX Series Switch on page 33
- Loading a Previous Configuration File (CLI Procedure) on page 29
- Configuration Files Terms on page 15
- For information on show system configuration rescue, see the *JUNOS Software System Basics and Services Command Reference* at <http://www.juniper.net/techpubs/software/junos/junos94/index.html> .

Setting or Deleting the Rescue Configuration (J-Web Procedure)

A rescue configuration is a well-known configuration that recovers a switch from a configuration that denies management access. You set a current committed configuration to be the rescue configuration through the J-Web interface or CLI.

If someone inadvertently commits a configuration that denies management access to an EX Series switch and the console port is not accessible, you can overwrite the invalid configuration and replace it with the rescue configuration by using the LCD panel on the switch. The rescue configuration is a previously committed, valid configuration. We recommend that the rescue configuration include the IP address (accessible from the network) for the management port.

To view, set, or delete the rescue configuration using the J-Web interface, select **Maintain > Config Management > Rescue**. On the Rescue page, you can perform the following tasks:

- View the current rescue configuration—Click **View rescue configuration**.
- Set the current running configuration as the rescue configuration—Click **Set rescue configuration**.

- Delete the current rescue configuration—Click **Delete rescue configuration**.

- Related Topics**
- Setting or Deleting the Rescue Configuration (CLI Procedure) on page 32
 - Reverting to the Rescue Configuration for the EX Series Switch on page 33
 - Configuration Files Terms on page 15

Reverting to the Rescue Configuration for the EX Series Switch

If someone inadvertently commits a configuration that denies management access to an EX Series switch and the console port is not accessible, you can overwrite the invalid configuration and replace it with the rescue configuration by using the LCD panel on the switch. The rescue configuration is a previously committed, valid configuration.

You can also revert to the default factory configuration, as described in “Reverting to the Default Factory Configuration for the EX Series Switch” on page 30.

Before you begin to revert to the rescue configuration:

- Ensure that you have physical access to the switch.
- A rescue configuration for the switch must have been previously set.

To revert the switch to the rescue configuration:

1. At the LCD panel on the switch, press **Menu** until you see **MAINTENANCE MENU**.
2. Press **Enter**.
3. Press **Menu** until you see **Load Rescue**.
4. Press **Enter**.
5. When **Commit Rescue** is displayed, press **Enter**.

The LCD panel displays the message **Commit Rescue in Progress**. When the reversion is complete, it displays the idle menu.



NOTE: If there is no rescue configuration saved on the switch, the message **Commit rescue failed** is displayed.

- Related Topics**
- Setting or Deleting the Rescue Configuration (CLI Procedure) on page 32
 - Setting or Deleting the Rescue Configuration (J-Web Procedure) on page 32
 - LCD Panel in EX3200 and EX4200 Switches
 - LCD Panel in an EX8200 Switch
 - Configuration Files Terms on page 15

Chapter 2

Managing Log, Temporary, and Crash Files

- Managing Log, Temporary, and Crash Files on the Switch (J-Web Procedure) on page 35

Managing Log, Temporary, and Crash Files on the Switch (J-Web Procedure)

You can use the J-Web interface to rotate log files and delete unnecessary log, temporary, and crash files on the switching platform.

1. Cleaning Up Files on page 35
2. Downloading Files on page 36
3. Deleting Files on page 36

Cleaning Up Files

If you are running low on storage space, use the file cleanup procedure to quickly identify files to delete.

The file cleanup procedure performs the following tasks:

- Rotates log files—Archives the current log files, and creates fresh log files.
- Deletes log files in `/var/log`—Deletes files that are not currently being written to.
- Deletes temporary files in `/var/tmp`—Deletes files that have not been accessed within two days.
- Deletes all crash files in `/var/crash`—Deletes core files that the switch has written during an error.

To rotate log files and delete unnecessary files with the J-Web interface:

1. Select **Maintain>Files**.
2. In the Clean Up Files section, click **Clean Up Files**. The switching platform rotates log files and identifies files that can be safely deleted.

The J-Web interface displays the files that you can delete and the amount of space that will be freed on the file system.

3. Click one:
 - To delete the files and return to the Files page, click **OK**.

- To cancel your entries and return to the list of files in the directory, click **Cancel**.

Downloading Files

You can use the J-Web interface to download a copy of an individual log, temporary, or crash file from the switching platform. When you download a file, it is not deleted from the file system.

To download files with the J-Web interface:

1. In the J-Web interface, select **Maintain>Files**.
2. In the Download and Delete Files section, click one:
 - **Log Files**—Log files in the `/var/log` directory on the switch.
 - **Temporary Files**—Lists the temporary files in the `/var/tmp` directory on the switching platform.
 - **Jailed Temporary Files (Install, Session, etc)**—Lists the files in the `/var/jail/tmp` directory on the switching platform.
 - **Crash (Core) Files**—Lists the core files in the `/var/crash` directory on the switching platform.

The J-Web interface displays the files located in the directory.

3. Select the files that you want to download and click **Download**.
4. Choose a location for the saved file.

The file is saved as a text file, with a `.txt` file extension.

Deleting Files

You can use the J-Web interface to delete an individual log, temporary, and crash file from the switching platform. When you delete the file, it is permanently removed from the file system.



CAUTION: If you are unsure whether to delete a file from the switching platform, we recommend using the Clean Up Files tool described in *Cleaning Up Files*. This tool determines which files can be safely deleted from the file system.

To delete files with the J-Web interface:

1. Select **Maintain>Files**.
2. In the Download and Delete Files section, click one:

- Log Files—Lists the log files in the `/var/log` directory on the switching platform.
- Temporary Files—Lists the temporary files in the `/var/tmp` directory on the switching platform.
- Jailed Temporary Files (Install, Session, etc)—Lists the files in the `/var/jail/tmp` directory on the switching platform.
- Crash (Core) Files—Lists the core files in the `/var/crash` directory on the switching platform.

The J-Web interface displays the files in the directory.

3. Select the box next to each file you plan to delete.
4. Click **Delete**.

The J-Web interface displays the files you can delete and the amount of space that will be freed on the file system.

5. Click one of the following buttons on the confirmation page:
 - To delete the files and return to the Files page, click **OK**.
 - To cancel your entries and return to the list of files in the directory, click **Cancel**.

Chapter 3

Managing Password Changes

- [Configuring MS-CHAPv2 to Provide Password-Change Support \(CLI Procedure\)](#) on page 39

Configuring MS-CHAPv2 to Provide Password-Change Support (CLI Procedure)

JUNOS Software for EX Series switches enables you to configure the Microsoft Corporation implementation of the Challenge Handshake Authentication Protocol version 2 (MS-CHAPv2) on the switch to provide password-change support. Configuring MS-CHAPv2 on the switch provides users accessing a switch the option of changing the password when the password expires, is reset, or is configured to be changed at next login.

See RFC 2433 at [http://www.ietf.org/rfc/rfc2433.txt](#), Microsoft PPP CHAP Extensions, for information about MS-CHAP.

Before you configure MS-CHAPv2 to provide password-change support, ensure that you have:

- Configured RADIUS server authentication. Configure users on the authentication server and set the first-tried option in the authentication order to radius. See [Example: Connecting a RADIUS Server for 802.1X to an EX Series Switch](#).

To configure MS-CHAPv2, specify the following:

```
[edit system radius-options]
user@switch# set password-protocol mschap-v2
```

You must have the required access permission on the switch in order to change your password.

- Related Topics**
- [Managing Users \(J-Web Procedure\)](#)
 - For more about configuring user access, see the [JUNOS Software Access Privilege Configuration Guide](#) at [http://www.juniper.net/documentation/en_US/junos/topics/concept/junos-access-privilege-configuration.html](#)

