



JUNOS® Software Guide for EX Series Ethernet Switches

**JUNOS® Software Guide for EX Series Ethernet Switches,
Release 9.6: Alarms and System Log Messages**

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Revision

Published: 2009-08-05

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JUNOS® Software Guide for EX Series Ethernet Switches JUNOS® Software Guide for EX Series Ethernet Switches, Release 9.6: Alarms and System Log Messages
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Writing:
Editing:
Illustration:
Cover Design:

Revision History
5 August 2009—Revision 1

The information in this document is current as of the date listed in the revision history.

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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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We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. Send e-mail to techpubs-comments@juniper.net with the following:

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

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- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/customers/support/downloads/710059.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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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:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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

Opening a Case with JTAC

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

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

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

Part 1

Alarms and System Log Messages on EX Series Switches

- JUNOS Software—Overview on page 3
- Alarm Types and Severity Levels on EX Series Switches on page 15
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Chapter 1

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"> ■ Commit scripts ■ Operation scripts ■ 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: <ul style="list-style-type: none"> ■ Media access control (MAC) encapsulation ■ 802.1p tagging 	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
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 *JUNOS Network Operations Guide* at <http://www.juniper.net/techpubs/software/junos/junos90/index.html>.
 - For more information about basic system parameters, supported protocols, and software processes, see *JUNOS System Basics Configuration Guide* at <http://www.juniper.net/techpubs/software/junos/junos94/index.html>.

Chapter 2

Alarm Types and Severity Levels on EX Series Switches

- Understanding Alarm Types and Severity Levels on EX Series Switches on page 15
- Checking Active Alarms with the J-Web Interface on page 16
- Monitoring Chassis Alarms for an EX8200 Switch on page 17

Understanding Alarm Types and Severity Levels on EX Series Switches

Before monitoring alarms on the switch, become familiar with the terms defined in Table 3 on page 15.

Table 3: Alarm Terms

Term	Definition
alarm	Signal alerting you to conditions that might prevent normal operation. On a switch, the alarm signal is the yellow ALARM LED lit on the front of the chassis.
alarm condition	Failure event that triggers an alarm.
alarm severity	Seriousness of the alarm. The level of severity can be either major (red) or minor (yellow).
chassis alarm	Predefined alarm triggered by a physical condition on the switch such as a power supply failure, excessive component temperature, or media failure.
system alarm	Predefined alarm triggered by a missing rescue configuration or failure to install a license for a licensed software feature.

Alarm Types

The switch supports these alarms:

- Chassis alarms indicate a failure on the switch or one of its components. Chassis alarms are preset and cannot be modified.
- System alarms indicate a missing rescue configuration. System alarms are preset and cannot be modified, although you can configure them to appear automatically in the J-Web interface display or CLI display.

Alarm Severity Levels

Alarms on an Juniper Networks EX Series Ethernet Switches have two severity levels:

- Major (red)—Indicates a critical situation on the switch that has resulted from one of the following conditions. A red alarm condition requires immediate action.
 - One or more hardware components have failed.
 - One or more hardware components have exceeded temperature thresholds.
 - An alarm condition configured on an interface has triggered a critical warning.
- Minor (yellow or amber)—Indicates a noncritical condition on the switch that, if left unchecked, might cause an interruption in service or degradation in performance. A yellow alarm condition requires monitoring or maintenance.

A missing rescue configuration generates a yellow system alarm.

- Related Topics**
- Checking Active Alarms on the Switch with the J-Web Interface
 - Understanding How to Use the J-Web Interface to View System Information

Checking Active Alarms with the J-Web Interface

Purpose Use the monitoring functionality to view alarm information for the EX Series switches including alarm type, alarm severity, and a brief description for each active alarm on the switching platform.

Action To view the active alarms:

1. Select **Monitor > Events and Alarms > View Alarms** in the J-Web interface.
2. Select an alarm filter based on alarm type, severity, description, and date range.
3. Click **Go**.

All the alarms matching the filter are displayed.



NOTE: When the switch is reset, the active alarms are displayed.

Meaning Table 4 on page 16 lists the alarm output fields.

Table 4: Summary of Key Alarm Output Fields

Field	Values
Type	Category of the alarm: <ul style="list-style-type: none"> ■ Chassis—Indicates an alarm condition on the chassis (typically an environmental alarm such as one related to temperature). ■ System—Indicates an alarm condition in the system.

Table 4: Summary of Key Alarm Output Fields (continued)

Field	Values
Severity	Alarm severity—either major (red) or minor (yellow).
Description	Brief synopsis of the alarm.
Time	Date and time when the failure was detected.

- Related Topics**
- Monitoring System Log Messages on page 21
 - Dashboard for EX Series Switches
 - Understanding Alarm Types and Severity Levels on EX Series Switches on page 15

Monitoring Chassis Alarms for an EX8200 Switch

Purpose This document provides information on chassis alarm conditions, and how you should respond when a certain chassis alarm is seen on your switch.

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions. See “Understanding Alarm Types and Severity Levels on EX Series Switches” on page 15.

Action You can monitor chassis alarms by watching the ALM chassis status LED and using the LCD panel to gather information about the alarm. See Chassis Status LEDs in an EX8200 Switch and LCD Panel in an EX8200 Switch.

To display switch chassis alarms in the CLI, use the following command

```
user@host> show chassis alarms
```

The command output displays the number of alarms currently active, the time when the alarm began, the severity level, and an alarm description. Note the date and time of an alarm so that you can correlate it with error messages in the messages system log file.

You can also monitor chassis alarms using the J-Web interface. See “Checking Active Alarms with the J-Web Interface” on page 16.

Table 1 lists some of the chassis alarms that an EX8200 switch can generate.

Table 5: Chassis Alarms for EX8200 Switches

Component	Alarm Condition	Remedy	Severity	Additional Information
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Table 5: Chassis Alarms for EX8200 Switches (continued)

Fan tray	The fan tray has been removed from the chassis.	Install the fan tray.	Yellow/Red	<p>The switch will eventually get too hot to operate if a fan tray is removed. Temperature alarms will follow.</p> <p>This alarm is expected during fan tray removal and installation.</p>
Fan tray	One or more fans in a fan tray is spinning below the required speed.	Replace the fan tray.	Red	Individual fans cannot be replaced; you must replace the fan tray.
Fan tray	The fan tray's internal connection to the switch is not functioning properly.	<p>Remove and reinsert the fan tray.</p> <p>If removing and reinserting the fan tray does not resolve the problem, reboot the switch.</p>	Red	The switch will eventually get too hot to operate if a fan tray is not operating. Temperature alarms will follow.
Power supply	A power supply slot that contained a power supply at bootup is now empty.	Install a power supply in the empty power supply slot.	Yellow	<p>You can ignore this alarm in cases in which a power supply slot can remain empty.</p> <p>You will not see this alarm if the switch is booted with an empty power supply slot.</p> <p>This alarm is expected during power supply removal and installation.</p> <p>This alarm can be triggered by a line card insertion. The alarm condition corrects itself when seen for this reason.</p>
Power supply	A power supply has failed due to an input or output failure, or due to temperature issues.	Replace the failed power supply.	Red	
Power supply	A power supply's internal connection to the switch is not operating properly.	<p>Remove and reinsert the power supply.</p> <p>If removing and reinserting the power supply does not resolve the problem, reboot the switch.</p>	Red	

Table 5: Chassis Alarms for EX8200 Switches (continued)

Temperature	The chassis warm temperature threshold has been exceeded and fan speeds have increased.	Adjust room temperature downward, if possible. Ensure airflow through the switch is unobstructed.	Yellow	The chassis is warm and should be cooled down. The switch is still functioning normally. To monitor temperature: user@switch > show chassis environment To monitor temperature thresholds: user@switch > show chassis temperature-thresholds
Temperature	The chassis high temperature threshold has been exceeded and the fans are operating at full speed.	Adjust room temperature downward, if possible. Ensure airflow through the switch is unobstructed.	Red	The chassis is hot and should be cooled down. The switch might still function normally but is close to shutting down if it hasn't already. To monitor temperature: user@switch > show chassis environment To monitor temperature thresholds: user@switch > show chassis temperature-thresholds
Temperature	The chassis warm temperature threshold has been exceeded, and one or more fans are not operating properly. The operating fans are running at full speed.	Replace the fan tray that has the faulty fan or fans. Adjust room temperature downward, if possible. Ensure airflow through the switch is unobstructed.	Yellow	The chassis is warm and should be cooled down. The switch is still functioning normally. To monitor temperature: user@switch > show chassis environment To monitor temperature thresholds: user@switch > show chassis temperature-thresholds

Table 5: Chassis Alarms for EX8200 Switches (continued)

Temperature	The chassis high temperature threshold has been exceeded, and one or more fans is not operating properly. The operating fans are running at full speed.	Replace the fan tray that has the faulty fan or fans. Adjust room temperature downward, if possible. Ensure airflow through the switch is unobstructed.	Red	The chassis is hot and should be cooled down. The switch might still function normally but is close to shutting down if it hasn't already. To monitor temperature: user@switch > show chassis environment To monitor temperature thresholds: user@switch > show chassis temperature-thresholds
Temperature	The temperature sensor on a hardware component has failed.	Replace the hardware component.	Yellow	
Routing Engine (RE), Switch Fabric and Routing Engine (SRE), or Switch Fabric (SF) module	The RE, SRE, or SF module has failed.	The RE, SRE, or SF module must be replaced.	Red	
Link Status	The link to the network is down.	Check network connectivity.	Red or Yellow	The network link is disabled by default, so you might see this alarm before you connect the switch to the network.

- Related Topics**
- Checking Active Alarms with the J-Web Interface on page 16
 - Chassis Status LEDs in an EX8200 Switch

Chapter 3

System Log Messages in EX Series Switches

- Monitoring System Log Messages on page 21

Monitoring System Log Messages

Purpose Use the monitoring functionality to filter and view system log messages for EX Series switches.

Action To view events in the J-Web interface, select **Monitor > Events and Alarms > View Events**.

Apply a filter or a combination of filters to view messages. You can use filters to display relevant events. Table 6 on page 21 describes the different filters, their functions, and the associated actions.

To view events in the CLI, enter the following command:

```
show log
```

Table 6: Filtering System Log Messages

Field	Function	Your Action
System Log File	<p>Specifies the name of a system log file for which you want to display the recorded events.</p> <p>Lists the names of all the system log files that you configure.</p> <p>By default, a log file, <code>messages</code>, is included in the <code>/var/log/</code> directory.</p>	<p>To specify events recorded in a particular file, select the system log filename from the list—for example, <code>messages</code>.</p> <p>Select Include archived files to include archived files in the search.</p>
Process	<p>Specifies the name of the process generating the events you want to display.</p> <p>To view all the processes running on your system, enter the CLI command <code>show system processes</code>.</p> <p>For more information about processes, see the <i>JUNOS Software Installation and Upgrade Guide</i> at www.juniper.net/techpubs</p>	<p>To specify events generated by a process, type the name of the process.</p> <p>For example, type <code>mgd</code> to list all messages generated by the management process.</p>

Table 6: Filtering System Log Messages (continued)

Field	Function	Your Action
Date From To	<p>Specifies the time period in which the events you want displayed are generated.</p> <p>Displays a calendar that allows you to select the year, month, day, and time. It also allows you to select the local time.</p> <p>By default, the messages generated in the last hour are displayed. End Time shows the current time and Start Time shows the time one hour before End Time.</p>	<p>To specify the time period:</p> <ul style="list-style-type: none"> ■ Click the Calendar icon and select the year, month, and date—for example, 02/10/2007. ■ Click the Calendar icon and select the year, month, and date—for example, 02/10/2007. ■ Click to select the time in hours, minutes, and seconds.
Event ID	<p>Specifies the event ID for which you want to display the messages.</p> <p>Allows you to type part of the ID and completes the remainder automatically.</p> <p>An event ID, also known as a system log message code, uniquely identifies a system log message. It begins with a prefix that indicates the generating software process or library.</p>	<p>To specify events with a specific ID, type the partial or complete ID—for example, TFTPD_AF_ERR.</p>
Description	<p>Specifies text from the description of events that you want to display.</p> <p>Allows you to use regular expressions to match text from the event description.</p> <p>NOTE: Regular expression matching is case-sensitive.</p>	<p>To specify events with a specific description, type a text string from the description with regular expression.</p> <p>For example, type ^Initial* to display all messages with lines beginning with the term <i>Initial</i>.</p>
Search	<p>Applies the specified filter and displays the matching messages.</p>	<p>To apply the filter and display messages, click Search.</p>

Meaning Table 7 on page 23 describes the Event Summary fields.



NOTE: By default, the View Events page in the J-Web interface displays the most recent 25 events, with severity levels highlighted in different colors. After you specify the filters, Event Summary displays the events matching the specified filters. Click the **First**, **Next**, **Prev**, and **Last** links to navigate through messages.

Table 7: Viewing System Log Messages

Field	Function	Additional Information
Process	Displays the name and ID of the process that generated the system log message.	The information displayed in this field is different for messages generated on the local Routing Engine than for messages generated on another Routing Engine (on a system with two Routing Engines installed and operational). Messages from the other Routing Engine also include the identifiers re0 and re1 to identify the Routing Engine.
Severity	<p>Severity level of a message is indicated by different colors.</p> <ul style="list-style-type: none"> ■ Unknown—Gray—Indicates no severity level is specified. ■ Debug/Info/Notice—Green—Indicates conditions that are not errors but are of interest or might warrant special handling. ■ Warning—Yellow—Indicates conditions that warrant monitoring. ■ Error—Blue—Indicates standard error conditions that generally have less serious consequences than errors in the emergency, alert, and critical levels. ■ Critical—Pink—Indicates critical conditions, such as hard-drive errors. ■ Alert—Orange—Indicates conditions that require immediate correction, such as a corrupted system database. ■ Emergency—Red—Indicates system panic or other conditions that cause the switch to stop functioning. 	A severity level indicates how seriously the triggering event affects switch functions. When you configure a location for logging a facility, you also specify a severity level for the facility. Only messages from the facility that are rated at that level or higher are logged to the specified file.
Event ID	<p>Displays a code that uniquely identifies the message.</p> <p>The prefix on each code identifies the message source, and the rest of the code indicates the specific event or error.</p>	<p>The event ID begins with a prefix that indicates the generating software process.</p> <p>Some processes on a switch do not use codes. This field might be blank in a message generated from such a process.</p> <p>An event can belong to one of the following type categories:</p> <ul style="list-style-type: none"> ■ Error—Indicates an error or failure condition that might require corrective action. ■ Event—Indicates a condition or occurrence that does not generally require corrective action.
Event Description	Displays a more detailed explanation of the message.	
Time	Displays the time at which the message was logged.	

Related Topics ■ Checking Active Alarms with the J-Web Interface on page 16

- Understanding Alarm Types and Severity Levels on EX Series Switches on page 15

Chapter 4

Troubleshooting

- Troubleshooting Loss of the Root Password on page 25

Troubleshooting Loss of the Root Password

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

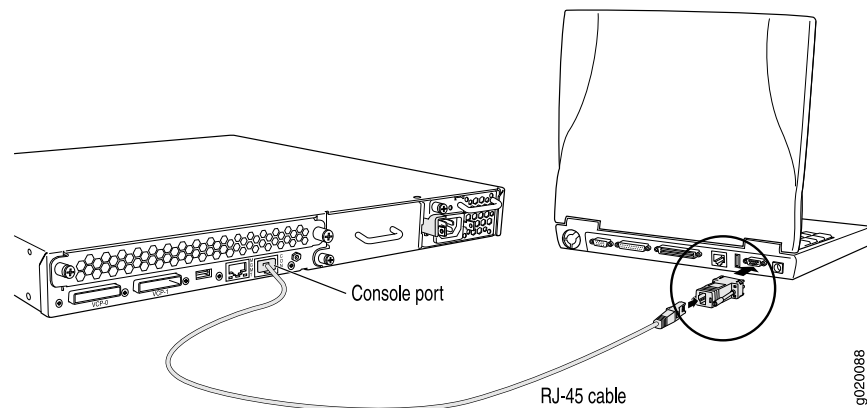


NOTE: You need physical access to the switch to recover the root password.

Solution To recover the root password:

1. Power off your switch by unplugging the power cord or turning off the power at the wall switch.
2. Insert one end of the Ethernet cable into the serial port on the management device and connect the other end to the console port on the back of the switch. See Figure 1 on page 25

Figure 1: Connecting to the Console Port on the EX Series Switch



3. On the management device, start your asynchronous terminal emulation application (such as Microsoft Windows Hyperterminal) and select the appropriate COM port to use (for example, COM1).
4. Configure the port settings as follows:

- Bits per second: 9600
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None
5. Power on your switch by plugging in the power cord or turning on the power at the wall switch.
 6. When the following prompt appears, press the Spacebar to access the switch's bootstrap loader command prompt:

```
Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [kernel] in 1 second...
```

7. At the following prompt, type **boot -s** to start up the system in single-user mode:
loader> **boot -s**
8. At the following prompt, type **recovery** to start the root password recovery procedure:
Enter full path name of shell or 'recovery' for root password recovery or RETURN for /bin/sh: **recovery**

A series of messages describe consistency checks, mounting of filesystems, and initialization and checkout of management services. Then the CLI prompt appears.

9. Enter configuration mode in the CLI:
user@switch> **configure**
10. Set the root password. For example:
user@switch# **set system root-authentication plain-text-password**
11. At the following prompt, enter the new root password. For example:
New password: **juniper1**

```
Retype new password:
```

12. At the second prompt, reenter the new root password.
13. If you are finished configuring the network, commit the configuration.
root@switch# **commit**

```
commit complete
```

14. Exit configuration mode in the CLI.
root@switch# **exit**
15. Exit operational mode in the CLI.
root@switch> **exit**
16. At the prompt, enter **y** to reboot the switch.
Reboot the system? [y/n] **y**

- Related Topics**
- Connecting and Configuring an EX Series Switch (CLI Procedure)
 - Connecting and Configuring an EX Series Switch (J-Web Procedure)
 - For information about configuring an encrypted root password, configuring SSH keys to authenticate root logins, and configuring special requirements for plain-text passwords, see the *JUNOS System Basics Configuration Guide* at <http://www.juniper.net/techpubs/software/junos/junos90/>.

