

# About This Guide

This preface provides the following guidelines for using the *JUNOS<sup>™</sup> Software for E-series<sup>™</sup> Routing Platforms Multicast Routing Configuration Guide*:

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## Objectives

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This guide provides the information you need to configure multicast routing for IP and IPv6 on your E-series router.

An E-series router is shipped with the latest system software installed. If you need to install a future release or reinstall the system software, refer to the procedures in *JUNOS<sup>™</sup> System Basics Configuration Guide, Chapter 3, Installing JUNOS<sup>™</sup> Software*.



**NOTE:** If the information in the latest *JUNOS<sup>™</sup> Release Notes* differs from the information in this guide, follow the *JUNOS<sup>™</sup> Release Notes*.

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## Audience

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This guide is intended for experienced system and network specialists working with E-series routers in an Internet access environment.

## E-series Routers

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Seven models of E-series routers are available:

- E120 router
- E320 router
- ERX-1440 router
- ERX-1410 router
- ERX-710 router
- ERX-705 router
- ERX-310 router

All models use the same software. For information about all models except the E120 router and the E320 router, see *ERX Hardware Guide, Chapter 1, ERX Overview*. For information about the E120 router and the E320 router, see *E120 and E320 Hardware Guide, Chapter 1, E120 and E320 Overview*.

In the E-series documentation, the term ERX-14xx models refers to both the ERX-1440 router and the ERX-1410 router. Similarly, the term ERX-7xx models refers to both the ERX-710 router and the ERX-705 router. The terms ERX-1440 router, ERX-1410 router, ERX-710 router, ERX-705 router, ERX-310 router, E120 router, and E320 router refer to the specific models.

## Documentation Conventions

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Table 1 defines notice icons used in this guide.

**Table 1: Notice Icons**




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

Table 2 defines text conventions used in this guide and the syntax conventions used primarily in the *JUNOS Command Reference Guide*. For more information about command syntax, see *JUNOS System Basics Configuration Guide, Chapter 2, Command-Line Interface*.

**Table 2: Text and Syntax Conventions**

Convention	Description	Examples
<b>Text Conventions</b>		
<b>Bold text like this</b>	Represents commands and keywords in text.	<ul style="list-style-type: none"> <li>■ Issue the <b>clock source</b> command.</li> <li>■ Specify the keyword <b>exp-msg</b>.</li> </ul>
<b>Bold text like this</b>	Represents text that the user must type.	host1(config)# <b>traffic class low-loss1</b>
Fixed-width text like this	Represents information as displayed on your terminal's screen.	<pre>host1#show ip ospf 2 Routing Process OSPF 2 with Router ID 5.5.0.250 Router is an Area Border Router (ABR)</pre>
<i>Italic text like this</i>	<ul style="list-style-type: none"> <li>■ Emphasizes words.</li> <li>■ Identifies variables.</li> <li>■ Identifies chapter, appendix, and book names.</li> </ul>	<ul style="list-style-type: none"> <li>■ There are two levels of access, <i>user</i> and <i>privileged</i>.</li> <li>■ <i>clusterId</i>, <i>ipAddress</i>.</li> <li>■ <i>Appendix A, System Specifications</i>.</li> </ul>
Plus sign (+) linking key names	Indicates that you must press two or more keys simultaneously.	Press Ctrl + b.
<b>Syntax Conventions in the Command Reference Guide</b>		
Plain text like this	Represents keywords.	terminal length
<i>Italic text like this</i>	Represents variables.	<i>mask</i> , <i>accessListName</i>
(pipe symbol)	Represents a choice to select one keyword or variable to the left or right of this symbol. (The keyword or variable can be either optional or required.)	diagnostic   line
[ ] (brackets)	Represent optional keywords or variables.	[ internal   external ]
[ ]* (brackets and asterisk)	Represent optional keywords or variables that can be entered more than once.	[ level1   level2   l1 ]*
{ } (braces)	Represent required keywords or variables.	{ permit   deny } { in   out } { <i>clusterId</i>   <i>ipAddress</i> }

## Related E-series and JUNOS Documentation

The E-series and JUNOS documentation set consists of several hardware and software guides, which are available in electronic and printed formats.

### E-series and JUNOS Documents

Table 3 lists and describes the E-series and JUNOS document set. For a complete list of abbreviations used in this document set, along with their spelled-out terms, see *JUNOS System Basics Configuration Guide, Appendix A, Abbreviations and Acronyms*.

**Table 3: Juniper Networks E-series and JUNOS Technical Publications**

Document	Description
<b>E-series Hardware Documentation</b>	
<i>E120 and E320 Quick Start Guide</i>	Shipped in the box with all new E120 and E320 routers. Provides the basic procedures to help you get the routers up and running quickly.
<i>E120 and E320 Hardware Guide</i>	<p>Provides the necessary procedures for getting E120 routers and E320 routers operational, including information about:</p> <ul style="list-style-type: none"> <li>■ Installing the chassis and modules</li> <li>■ Connecting cables</li> <li>■ Powering up the routers</li> <li>■ Configuring the routers for management access</li> <li>■ Troubleshooting common issues</li> </ul> <p>Describes switch route processor (SRP) modules, line modules, and I/O adapters (IOAs) available for E120 and E320 routers.</p>
<i>E120 and E320 Module Guide</i>	<p>Provides detailed specifications for line modules and IOAs in E120 and E320 routers, and information about the compatibility of these modules with JUNOS software releases.</p> <p>Lists the layer 2 protocols, layer 3 protocols, and applications that line modules and their corresponding IOAs support.</p> <p>Provides module LED information.</p>
<i>E-series Installation Quick Start poster or ERX Quick Start Guide</i>	Shipped in the box with all new ERX routers. Provides the basic procedures to help you get an ERX router up and running quickly.
<i>ERX Hardware Guide</i>	<p>Provides the necessary procedures for getting ERX-14xx models, ERX-7xx models, and ERX-310 routers operational, including information about:</p> <ul style="list-style-type: none"> <li>■ Installing the chassis and modules</li> <li>■ Connecting cables</li> <li>■ Powering up the routers</li> <li>■ Configuring the routers for management access</li> <li>■ Troubleshooting common issues</li> </ul> <p>Describes switch route processor (SRP) modules, line modules, and I/O modules available for the ERX routers.</p>
<i>ERX Module Guide</i>	<p>Provides detailed specifications for line modules and I/O modules in ERX-14xx models, ERX-7xx models, and ERX-310 routers, and information about the compatibility of these modules with JUNOS software releases.</p> <p>Lists the layer 2 protocols, layer 3 protocols, and applications that line modules and their corresponding I/O modules support.</p> <p>Provides module LED information.</p>

**Table 3: Juniper Networks E-series and JUNOS® Technical Publications (continued)**

Document	Description
<i>ERX End-of-Life Module Guide</i>	Provides an overview and description of ERX modules that are end-of-life (EOL) and can no longer be ordered for the following routers: <ul style="list-style-type: none"> <li>■ ERX-7xx models</li> <li>■ ERX-14xx models</li> <li>■ ERX-310 router</li> </ul>
<b>JUNOS® Software Guides</b>	
<i>JUNOS® System Basics Configuration Guide</i>	Provides information about: <ul style="list-style-type: none"> <li>■ Planning and configuring your network</li> <li>■ Using the command-line interface (CLI)</li> <li>■ Installing JUNOS® software</li> <li>■ Configuring the Simple Network Management Protocol (SNMP)</li> <li>■ Managing the router and its modules, including the use of high availability (HA) for SRP redundancy</li> <li>■ Configuring and running a unified in-service software upgrade (ISSU)</li> <li>■ Configuring passwords and security</li> <li>■ Configuring the router clock</li> <li>■ Configuring virtual routers</li> </ul>
<i>JUNOS® Physical Layer Configuration Guide</i>	Explains how to configure, test, and monitor physical layer interfaces.
<i>JUNOS® Link Layer Configuration Guide</i>	Explains how to configure and monitor static and dynamic link layer interfaces.
<i>JUNOS® IP, IPv6, and IGP Configuration Guide</i>	Explains how to configure and monitor IP, IPv6 and Neighbor Discovery, and interior gateway protocols (RIP, OSPF, and IS-IS).
<i>JUNOS® IP Services Configuration Guide</i>	Explains how to configure and monitor IP routing services. Topics include: <ul style="list-style-type: none"> <li>■ Routing policies</li> <li>■ Firewalls</li> <li>■ Network Address Translation (NAT)</li> <li>■ J-Flow statistics</li> <li>■ Bidirectional forwarding detection (BFD)</li> <li>■ Internet Protocol Security (IPSec)</li> <li>■ Access Node Control Protocol (ANCP), also known as Layer 2 Control (L2C)</li> <li>■ Digital certificates</li> <li>■ IP tunnels</li> <li>■ Virtual Router Redundancy Protocol (VRRP)</li> <li>■ Mobile IP home agent</li> </ul>
<i>JUNOS® Multicast Routing Configuration Guide</i>	Explains how to configure and monitor IP multicast routing and IPv6 multicast routing. Topics include: <ul style="list-style-type: none"> <li>■ Internet Group Management Protocol (IGMP)</li> <li>■ Protocol Independent Multicast (PIM)</li> <li>■ Distance Vector Multicast Routing Protocol (DVMRP)</li> <li>■ Multicast Listener Discovery (MLD)</li> </ul>

**Table 3: Juniper Networks E-series and JUNOS Technical Publications (continued)**

Document	Description
<i>JUNOS BGP and MPLS Configuration Guide</i>	Explains how to configure and monitor: <ul style="list-style-type: none"> <li>■ Border Gateway Protocol (BGP) routing</li> <li>■ Multiprotocol Label Switching (MPLS) and related applications</li> <li>■ Layer 2 services over MPLS</li> <li>■ Virtual private LAN service (VPLS)</li> <li>■ Layer 2 virtual private networks (L2VPNs)</li> </ul>
<i>JUNOS Policy Management Configuration Guide</i>	Explains how to configure, manage, and monitor customized policy rules for packet classification, forwarding, filtering, and flow rates. Also describes the packet mirroring feature, which uses secure policies.
<i>JUNOS Quality of Service Configuration Guide</i>	Explains how to configure quality of service (QoS) features to queue, schedule, and monitor traffic flow. These features include: <ul style="list-style-type: none"> <li>■ Traffic classes and traffic-class groups</li> <li>■ Drop, queue, QoS, and scheduler profiles</li> <li>■ QoS parameters</li> <li>■ Statistics</li> </ul>
<i>JUNOS Broadband Access Configuration Guide</i>	Explains how to configure and monitor a remote access environment, which can include the following features: <ul style="list-style-type: none"> <li>■ Authentication, authorization, and accounting (AAA)</li> <li>■ Dynamic Host Configuration Protocol (DHCP)</li> <li>■ Remote Authentication Dial-In User Service (RADIUS)</li> <li>■ Terminal Access Controller Access Control System (TACACS+)</li> <li>■ Layer 2 Tunneling Protocol (L2TP)</li> <li>■ Subscriber management</li> </ul>
<i>JUNOS System Event Logging Reference Guide</i>	Describes the JUNOS system logging feature and describes how to use the CLI to monitor your system's log configuration and system events.
<i>JUNOS Command Reference Guide A to M:</i> <i>JUNOS Command Reference Guide N to Z</i>	Together constitute the <i>JUNOS Command Reference Guide</i> . Contain important information about commands implemented in the system software. Use to look up: <ul style="list-style-type: none"> <li>■ Descriptions of commands and command parameters</li> <li>■ Command syntax</li> <li>■ A command's related mode</li> <li>■ Starting with JUNOS Release 7.1.0, a history of when a command, its keywords, and its variables were introduced or added</li> </ul> Use with the JUNOS configuration guides.
<i>JUNOS Comprehensive Index</i>	Provides a complete index of the JUNOS software documentation set.
<i>JUNOS Glossary</i>	Provides definitions for terms used in JUNOS technical documentation.
<b>Release Notes</b>	
<i>JUNOS Release Notes</i>	Provide the latest information about features, changes, known problems, resolved problems, and system maximum values. If the information in the <i>Release Notes</i> differs from the information found in the documentation set, follow the <i>Release Notes</i> .  Release notes are included on the corresponding software CD and are available on the Web.

## **JUNOS<sup>e</sup> Configuration Guides**

JUNOS<sup>e</sup> software configuration guides use a bottom-up approach to describe the relationship of layers, protocols, and interfaces in the configuration process. For more information, see *Layered Approach* in *JUNOS<sup>e</sup> System Basics Configuration Guide, Chapter 1, Planning Your Network*.

The chapters in JUNOS<sup>e</sup> software configuration guides typically include the following topics:

- Conceptual and overview information
- Information you need to know or tasks you need to perform before you begin
- Platform-specific issues you need to take into consideration
- Applicable references, such as RFCs and IETF draft documents, about the protocols and features supported by the router
- Required and optional tasks, as step-by-step procedures
- Descriptions and examples of the commands you use
- Illustrations of network topologies
- Examples of command sequences for configuration, testing, and monitoring activities
- Sample displays that result when you issue the **show** command

## **Obtaining Documentation**

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To obtain the most current version of all Juniper Networks technical documentation, see the products documentation page on the Juniper Networks Web site at <http://www.juniper.net/>.

To order a documentation CD, which contains this manual, contact your sales representative.

Copies of the Management Information Bases (MIBs) available in a software release are included on the software CDs and at <http://www.juniper.net/>.

## Documentation Feedback

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We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation to better meet your needs. Send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net), or fill out the documentation feedback form at <http://www.juniper.net/techpubs/docbug/docbugreport.html>. If you are using e-mail, be sure to include the following information with your comments:

- Document name
- Document part number
- Page number
- Software release version

## Requesting Technical Support

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

- **JTAC Policies**—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <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.

## Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings:  
<http://www.juniper.net/customers/support/>
- Search for known bugs:  
<http://www2.juniper.net/kb/>
- 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:  
<https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum:  
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Manager:  
<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 Manager 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, visit  
<http://www.juniper.net/support/requesting-support.html>

