



7450 Ethernet Service Switch  
7750 Service Router  
7950 Extensible Routing System  
Virtualized Service Router  
Release 24.10.R1

## Guide to Documentation

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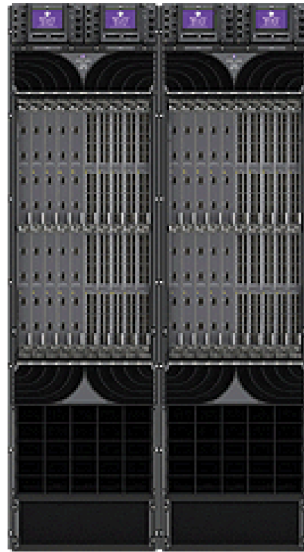
# 1 About this guide

This guide provides information about the Service Router Operating System (SR OS) user guides available for the 7450 ESS, 7750 SR, 7950 XRS, and VSR. The following figures show the products included under each platform.

*Figure 1: 7950 eXtensible Routing System (XRS)*



7950 XRS-20



7950 XRS-40



7950 XRS-20e

NN3224

Figure 2: 7750 Service Router (SR), 7450 Ethernet Service Switch (ESS), and VSR



## 2 Platforms and terminology



**Note:**

Unless explicitly noted otherwise, this guide uses the terminology defined in the following table to collectively designate the specified platforms.

*Table 1: Platforms and terminology*

Platform	Collective platform designation
7450 ESS-7	All
7450 ESS-12	
7750 SR-1	
7750 SR-1-24D	
7750 SR-1-46S	
7750 SR-1-48D	
7750 SR-1-92S	
7750 SR-1x-48D	
7750 SR-1x-92S	
7750 SR-7	
7750 SR-12	
7750 SR-12e	
7750 SR-a4	
7750 SR-a8	
7750 SR-1e	
7750 SR-2e	
7750 SR-3e	
7750 SR-1s	
7750 SR-1se	
7750 SR-2s	
7750 SR-2se	
7750 SR-7s	
7750 SR-14s	

Platform	Collective platform designation	
7950 XRS-20		
7950 XRS-20e		
7950 XRS-40		
VSR		
VSR-NRC		
7450 ESS-7	7450 ESS	
7450 ESS-12		
7750 SR-1	7750 SR	
7750 SR-1-24D		
7750 SR-1-46S		
7750 SR-1-48D		
7750 SR-1-92S		
7750 SR-1x-48D		
7750 SR-1x-92S		
7750 SR-7		
7750 SR-12		
7750 SR-12e		
7750 SR-1-24D		7750 SR-1 (FP5)
7750 SR-1-46S		
7750 SR-1-48D		
7750 SR-1-92S		
7750 SR-1x-48D		
7750 SR-1x-92S		
7750 SR-7	7750 SR-7/12/12e	
7750 SR-12		
7750 SR-12e		
7750 SR-7	7750 SR-7/12	
7750 SR-12		
7750 SR-a4	7750 SR-a	
7750 SR-a8		

<b>Platform</b>	<b>Collective platform designation</b>
7750 SR-1e	7750 SR-e
7750 SR-2e	
7750 SR-3e	
7750 SR-1s	7750 SR-s
7750 SR-1se	
7750 SR-2s	
7750 SR-2se	
7750 SR-7s	
7750 SR-14s	
7950 XRS-20	7950 XRS
7950 XRS-20e	
7950 XRS-40	
VSR	VSR
VSR-NRC	



## 3 SR OS documentation suite

The SR OS documentation suite described in this guide covers the software and hardware features and functionality of the 7450 ESS, 7750 SR, 7950 XRS, and VSR platforms. The documentation suite covers areas such as configuration guidelines, services, routing protocols, troubleshooting methods, and chassis and card installation.

### 3.1 Software guides

Intended audience:

- A – network architects and designers
- B – installers and hardware maintenance technicians
- C – network technicians, administrators, operators, and service providers

The following tables describe the software guides in this documentation suite and the intended audience for each guide.

*Table 2: Software guides*

Document	Description	Intended audience		
		A	B	C
<b>Install and commission</b>				
Virtualized 7250 IXR, 7750 SR, and 7950 XRS Simulator (vSIM) Installation and Setup Guide	Describes how to install and set up the Virtualized 7750 SR and 7950 XRS Simulator (vSIM)	✓	—	—
VSR CNF Installation and Setup Guide	Describes Nokia Virtualized Service Router (VSR) system architecture, functional overview, and how to install and set up the VSR as a Container Network Function (CNF)	✓	✓	✓
VSR VNF Installation and Setup Guide	Describes Nokia Virtualized Service Router (VSR) system architecture, functional overview, and how to install and set up the VSR as a Virtual Machine (VM) based Virtualized Network Function (VNF)	✓	✓	✓
<b>Operate and Maintain</b>				
7450 ESS, 7750 SR, and 7950 XRS Advanced Configuration Guides	Provides advanced configuration solutions and is a supplement to the other guides in this suite	✓	✓	✓

Document	Description	Intended audience		
		A	B	C
7450 ESS, 7750 SR, 7950 XRS, and VSR Basic System Configuration Guide	Describes file system management, boot option file (BOF) configuration, basic system management configuration, node timing, and synchronization functions	✓	✓	✓
7750 SR and VSR BNG CUPS User Plane Function Guide	Describes all aspects related to a Broadband Network Gateway (BNG) User Plane Function (UPF) in a BNG Control and User Plane Separation (CUPS) system	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Interface Configuration Guide	Describes how to provision Input/Output Modules (IOMs), XMA Control Modules (XCMs), Media Dependent Adapters (MDAs), XRS Media Adapters (XMAs), connectors, and ports	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Layer 2 Services and EVPN Guide	Describes Layer 2 service and Ethernet Virtual Private Network (EVPN) functionality and provides examples to configure and implement Virtual Leased Lines (VLLs), Virtual Private LAN Service (VPLS), Provider Backbone Bridging (PBB), and EVPN	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Layer 3 Services Guide: IES and VPRN	Describes Layer 3 service functionality and provides examples to configure and implement Internet Enhanced Services (IES) and Virtual Private Routed Network (VPRN) services	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR MD-CLI User Guide	Provides information about how to use the MD-CLI	✓	✓	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR MPLS Guide	Provides an overview of Multiprotocol Label Switching (MPLS), Resource Reservation Protocol (RSVP), and Label Distribution Protocol (LDP) and provides configuration examples	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Multicast Routing Protocols Guide	Provides an overview of multicast routing concepts and provides configuration examples for Internet Group Management Protocol (IGMP), Multicast Listener Discovery (MLD), Protocol Independent Multicast (PIM), Multicast Source Discovery Protocol (MSDP), Multipoint LDP, multicast extensions to BGP, and Multicast Connection Admission Control (MCAC)	✓	—	✓
7450 ESS, 7750 SR, and VSR Multiservice ISA and ESA Guide	Provides an overview of services provided by integrated service adapters and extended service appliances, such as Application Assurance, IPsec, ad insertion (ADI), and Network Address Translation (NAT), and provides configuration examples	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR	Provides example configuration of a peering router	✓	—	✓

Document	Description	Intended audience		
		A	B	C
Peering Quick Reference Guide				
7450 ESS, 7750 SR, 7950 XRS, and VSR Quality of Service Guide	Provides an overview of Quality of Service (QoS) policy management and provides configuration examples	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Router Configuration Guide	Describes logical IP routing interfaces and associated attributes such as IP addresses, as well as IP and MAC-based filtering, Virtual Router Redundancy Protocol (VRRP), and cflowd	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Security Best Practices and Hardening Guide	Provides an overview of the main security features available in SR OS routers along with configuration examples that focus on management, control, and data planes	✓	—	✓
7750 SR and 7950 XRS Segment Routing and PCE User Guide	Provides an overview of segment routing features with MPLS (SR-MPLS) and IPv6 (SRv6) data path encapsulations and path computation element (PCE) features	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Services Overview Guide	Provides a general overview of functionality provided by the routers and describes how to configure service parameters such as Service Access Points (SAPs), Service Destination Points (SDPs), customer information, and user services	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR System Management Guide	Describes system security features, SNMP and NETCONF features, and event and accounting logs; the guide also covers basic tasks such as configuring management access filters, passwords, and user profiles	✓	✓	✓
7450 ESS, 7750 SR, and VSR Triple Play Service Delivery Architecture Guide	Describes the Triple Play Service Delivery Architecture (TPSDA) support and provides examples to configure and implement various protocols and services	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Unicast Routing Protocols Guide	Provides an overview of unicast routing concepts and provides configuration examples for Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Intermediate-system-to-intermediate-system (IS-IS), and Border Gateway Protocol (BGP) routing protocols; also provides an overview of route policies and configuration examples	✓	—	✓
<b>Monitor and troubleshoot</b>				
7450 ESS and 7750 SR Troubleshooting Guide	Provides troubleshooting procedures for the 7450 ESS and 7750 SR routers; describes commonly encountered problems and events	—	✓	✓

Document	Description	Intended audience		
		A	B	C
7750 SR-s Troubleshooting Guide	Provides troubleshooting procedures for the 7750 SR-s routers; describes commonly encountered problems and events	—	✓	✓
7950 XRS Troubleshooting Guide	Provides troubleshooting procedures for the 7950 XRS; describes commonly encountered problems and events	—	✓	✓
SR OS Log Events Guide	Provides general information about log events	✓	✓	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR OAM and Diagnostics Guide	Describes how to configure features such as service mirroring and Lawful Intercept (LI), and how to use the Operations, Administration, and Maintenance (OAM) and diagnostics tools	✓	—	✓
<b>Reference</b>				
7450 ESS, 7750 SR, 7950 XRS, and VSR Acronyms Reference Guide	Provides expansions of acronyms found in the user guides	✓	✓	✓
SR BNG TPSDA Python3 API documentation	Describes the APIs BNG Triple Play services used by Python developers to integrate with supported Nokia routers running the SR OS	✓		✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Classic CLI Command Reference Guide	Describes all classic CLI commands (except for the clear, monitor, show, and tools commands) and their supported values and parameters	✓	✓	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR Clear, Monitor, Show, and Tools CLI Command Reference Guide	Describes all clear, monitor, show, and tools commands for both classic and MD-CLI and their supported values and parameters	✓	✓	✓
7750 SR and VSR Gx AVPs Reference Guide	Describes Gx Attribute Value Pairs (AVPs)	✓	—	✓
7750 SR and VSR Gy AVPs Reference Guide	Describes Gy Attribute Value Pairs (AVPs)	✓	—	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR MD-CLI Command Reference Guide	Describes all MD-CLI commands (except for the clear, monitor, show, and tools commands) and their supported values and parameters	✓	✓	✓
7450 ESS, 7750 SR, 7950 XRS, and VSR MD-CLI Quick Reference Guide	Provides a comparison of the Nokia SR OS Model-Driven Command Line Interface (MD-CLI) with those used by Junos OS and IOS XR	✓	✓	✓

Document	Description	Intended audience		
		A	B	C
7750 SR and VSR Network Interface Shell Configuration and User Guide	Describes the Nokia Network Interface Shell (NISH) system architecture, functional overview, features, and how to install and set up the NISH	✓	✓	✓
7450 ESS, 7750 SR, 7950 XRS and VSR Pay-as-You-Grow Licensing Reference Guide	Describes SR OS Pay-As-You-Grow licensing, including FP4 licensing upgrades	✓	✓	✓
pySROS API documentation	Describes the APIs for a model-driven management interface used by Python developers to integrate with supported Nokia routers running the SR OS	—	—	✓
7450 ESS, 7750 SR, and VSR RADIUS Attributes Reference Guide	Describes all supported RADIUS authentication, authorization, and accounting attributes	✓	—	✓

## 3.2 Hardware guides

The intended audience for the hardware guides in this documentation suite are network architects and designers, installers, and hardware maintenance technicians. These guides are not included with the SR software documentation package. See [Accessing documentation](#) for information about accessing hardware documentation.

### 7750 SR guides

- 7750 SR IOM5-e Installation Guide
- 7750 SR MDA-e-XP Installation Guide
- 7750 SR-1e, SR-2e, and SR-3e Chassis Installation Guide
- 7750 SR-12e Chassis Installation Guide
- 7750 SR-a4 and SR-a8 Chassis Installation Guide
- 7750 SR-1 Chassis Installation Guide
- 7750 SR-1 FP5 Chassis Installation Guide
- 7750 SR-1s Chassis Installation Guide
- 7750 SR-1s-3.0T Chassis Installation Guide
- 7750 SR-1se Chassis Installation Guide
- 7750 SR-2s Chassis Installation Guide
- 7750 SR-2se Chassis Installation Guide
- 7750 SR-2se Compact to 7750 SR-2se Full Upgrade Guide
- 7750 SR-7s and SR-14s Chassis Installation Guide
- 7750 SR-7s and SR-14s: Upgrading the Chassis Hardware from FP4 to FP5

- 7750 SR ESA Chassis Installation Guide
- 7750 SR IOM-s Installation Guide
- 7750 SR IOM2-se Installation Guide
- 7750 SR MDA-s Installation Guide
- 7750 SR MDA-se Installation Guide
- 7750 SR and 7250 IXR QSFP-LS User Guide
- 7750 SR XMA-s and XMA2-s Installation Guide
- Vertical Rack Mount Kit Installation Guide

#### **7450 ESS and 7750 SR guides**

- 7450 ESS and 7750 SR IOM4-e Installation Guide
- 7450 ESS and 7750 SR MDA-e Installation Guide
- 7450 ESS-7 and 7750 SR-7 Chassis Installation Guide
- 7450 ESS-12 and 7750 SR-12 Chassis Installation Guide
- 7450 ESS and 7750 SR Integrated Media Module Installation Guide
- 7750 SR and 7450 ESS SF/CPM to SF/CPM5 Hardware Upgrade Guide
- 7750 SR and 7450 ESS SFM6 and IOM5-e FP4 Hardware Upgrade Guide
- 7450 ESS and 7750 SR MDA-XP Installation Guide
- 7750 SR-7 and 7450 ESS-7 PEM-3 Upgrade Installation Note
- 7750 SR-12 and 7450 ESS-12 PEM-3 Upgrade Installation Note

#### **7950 XRS guides**

- 7950 XRS-20 and 7950 XRS-40 Chassis Installation Guide
- 7950 XRS-20 and 7950 XRS-20e FP4 Hardware Upgrade Guide
- 7950 XRS-20e and 7950 XRS-40 Chassis Installation Guide

#### **7750 SR and 7950 XRS guides**

- 7750 SR, 7950 XRS, and 7250 IXR Optical Patch Panel Installation Guide

#### **VSR-a guides**

- VSR-a Configuration and Deployment Guide for HN Series

#### **Supplementary information**

- Best Practices for Improving Equipment Protection and Longevity
- GNSS Installation Guide

## **3.3 Release notes**

The release notes are not included with the SR software documentation package. See [Accessing documentation](#) for information about accessing release notes.

- *SR OS R24.x.Rx Software Release Notes*
- SR OS AA Protocols and Applications Release Notes (spreadsheet)

- Application Assurance (AA) Protocols and Application Support
- 7750 SR VSR BNG CUPS Features Release Reference

The Nokia customer documentation team has introduced the RN Navigator – an online tool for quickly finding information in SR OS Release Notes – starting from Release 20. The RN Navigator can be accessed online at <https://documentation.nokia.com/sr/RN-Navigator/>. A customer account login is required.

## 4 Accessing documentation

Nokia customer documentation can be accessed through [WebHelp](#) or through the [Nokia Documentation Center](#).

Most SR OS software user guides described in this guide are publicly available (no authentication is required). The hardware guides, release notes, and some technical documents are restricted (authentication is required).

The SR OS software user guides for the 7450 ESS, 7750 SR, 7950 XRS, and VSR can be accessed using a search engine. For best results, search using the term "SR OS" followed by the current release and any applicable keywords. Because the hardware guides are restricted, they cannot be accessed using a search engine.



**Note:** Depending on your account permissions and login status, you may not be authorized to display or download restricted guides (indicated by a lock or key symbol). If the guide remains restricted after a valid login, contact a Nokia technical support representative to check your account permissions.

The SR OS documentation is available in the following formats:

- WebHelp HTML
- downloadable HTML library (WebHelp format)
- PDFs of each guide
- a zip file of all PDFs in the documentation suite



## 5 Technical support

Customer support representatives are available to assist you 24 hours a day, 7 days a week. To contact Technical Support, visit the Nokia Support portal: <https://customer.nokia.com/support/s/>.

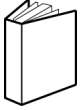
## 6 How to give feedback on documentation

You can use the following methods to report issues with the documentation, including errors or areas that need clarification, or to provide suggestions for improvement:

- **email**  
Send your feedback in an email to [documentation.feedback@nokia.com](mailto:documentation.feedback@nokia.com). Include the guide name, topic, and release.
- **online WebHelp**  
In the online WebHelp click the email feedback icon next to the topic title. Use the pop-up email to provide your comments about the topic.



# Customer document and product support



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[Product support portal](#)



## **Documentation feedback**

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