JUNIPER NETWORKS | Engineering Simplicity

SRX5400, SRX5600, and SRX5800 Firewall Card Reference

Published
2023-10-13

Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

SRX5400, SRX5600, and SRX5800 Firewall Card Reference

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at https://support.juniper.net/support/eula/. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

Table of Contents

1

PART

SRX5400, SRX5600, and SRX5800 Firewall Cards and Modules

CHAPTER 1

Overview

IN THIS CHAPTER

SRX5400, SRX5600, and SRX5800 Firewall Card Overview

The cards described in this guide let you upgrade and customize your SRX5400, SRX5600, or SRX5800 Firewall to suit the needs of your network. The following types of cards are available for the SRX5400, SRX5600, and SRX5800 Firewalls:

- I/O cards (IOCs) provide additional physical network connections to the firewall. Their primary function is to deliver data packets arriving on the physical ports to the Services Processing Cards (SPCs) and to forward data packets out the physical ports after services processing.
- Flex IOCs have two slots for port modules that add additional physical network connections to the firewall. Like IOCs, their primary function is to deliver data packets arriving on the physical ports to the SPCs and to forward data packets out the physical ports after services processing.
- Modular Port Concentrators (MPCs) have slots on the front panel that accept smaller cards called Modular Interface Cards (MICs). Each MIC has one or more physical interfaces on it. An MPC with MICs installed functions in the same way as a regular I/O card (IOC), but allows greater flexibility in adding different types of Ethernet ports to your firewall. MPCs and MICs are similar in form and function to Flex IOCs and port modules. However, the two use different form-factors, so you cannot install port modules in an MPC, nor can you install MICs in a Flex IOC.
- Services Processing Cards (SPCs) provide the processing power to run integrated services such as firewall, IPsec and IDP. All traffic traversing the firewall is passed to an SPC to have services processing applied to it.
- Switch Control Boards (SCBs) power on and power off IOCs and SPCs; control clocking and system resets; and control booting, monitor, and system functions. Each SCB has a slot in the front panel for a Routing Engine.

Although the following modules are not cards in the sense of having a form-factor that fits the card cage of the SRX5400, SRX5600, and SRX5800 Firewall, this guide also addresses the following modules that fit into certain SRX5400, SRX5600, and SRX5800 Firewall cards:

- Routing Engines fit into slots in SCBs and maintain the routing tables, manage the routing protocols used on the device, control the device interfaces and some chassis components, and provide the interface for system management and user access to the device.
- Port modules fit into slots in Flex IOCs and add additional physical network interface ports to the firewall.
- Modular Interface Cards (MICs) fit into slots in MPCs and add additional physical network interface ports to the firewall. MPCs and MICs are similar in form and function to Flex IOCs and port modules. However, the two use different form-factors, so you cannot install port modules in an MPC, nor can you install MICs in a Flex IOC.

Cards Supported on SRX5400, SRX5600, and SRX5800 Firewalls

Table 1 on page 3 describes the cards and other modules supported on the SRX5400, SRX5600, and SRX5800 Firewalls.

Table 1: Supported Cards for SRX5400, SRX5600, and SRX5800 Firewalls

Card Name and Model Number	Earliest Supported Junos OS Release		Last Supported Junos OS Release
	SRX5400	SRX5600 and SRX5800	SRX5400, SRX5600, and SRX5800
SPCs			
Services Processing Card SRX5K-SPC-2-10-40 Specifications	Not supported	9.2	12.3X48
Services Processing Card SRX5K-SPC-4-15-320 Specifications	12.1X46-D10	12.1X44-D10	

Table 1: Supported Cards for SRX5400, SRX5600, and SRX5800 Firewalls *(Continued)*

Card Name and Model Number	Earliest Supported Junos OS Release		Last Supported Junos OS Release
	SRX5400	SRX5600 and SRX5800	SRX5400, SRX5600, and SRX5800
Services Processing Card SRX5K-SPC3 Specifications	18.2R1-S1	18.2R1-S1	
Interface Cards			
I/O Card SRX5K-40GE-SFP Specifications	Not supported	9.2	12.3X48
I/O Card SRX5K-4XGE-XFP Specifications	Not supported	9.2	12.3X48
Flex I/O Card (SRX5K-FPC-IOC) Specifications	Not supported	10.2	12.3X48
Modular Port Concentrator (SRX5K-MPC) Specifications	12.1X46-D10	12.1X46-D10	
SRX5K-MPC3-40G10G Specifications	15.1X49-D10	15.1X49-D10	
SRX5K-MPC3-100G10G Specifications	15.1X49-D10	15.1X49-D10	
SRX5K-IOC4-10G Specifications	19.3R1	19.3R1	
SRX5K-IOC4-MRAT Specifications	19.3R1	19.3R1	
SCBs			

Table 1: Supported Cards for SRX5400, SRX5600, and SRX5800 Firewalls *(Continued)*

Card Name and Model Number	Earliest Supported Junos OS Release		Last Supported Junos OS Release
	SRX5400	SRX5600 and SRX5800	SRX5400, SRX5600, and SRX5800
Switch Control Board SRX5K-SCB Specifications	12.1X46-D10	9.2	12.3X48
Switch Control Board SRX5K-SCBE Specifications	12.1X47-D15	12.1X47-D15	
Switch Control Board SRX5K-SCB3 Specifications	15.1X49-D10	15.1X49-D10	
Switch Control Board SRX5K-SCB4 Specifications	Not supported	19.3R1	
Other modules			
Flex I/O Card Port Module SRX-IOC-16GE-SFP Specifications	Not supported	10.2	
Flex I/O Card Port Module SRX-IOC-16GE-TX Specifications	Not supported	10.2	
Flex I/O Card Port Module SRX-IOC-4XGE-XFP Specifications	Not supported	10.2	
MIC with 1x100GE CFP Interface (SRX-MIC-1X100G-CFP)	12.1X46-D10	12.1X46-D10	

Table 1: Supported Cards for SRX5400, SRX5600, and SRX5800 Firewalls *(Continued)*

Card Name and Model Number	Earliest Supported Junos OS Release		Last Supported Junos OS Release
	SRX5400	SRX5600 and SRX5800	SRX5400, SRX5600, and SRX5800
MIC with 2x40GE QSFP+ Interfaces (SRX-MIC-2X40G-QSFP)	12.1X46-D10	12.1X46-D10	
MIC with 10x10GE SFP+ Interfaces (SRX-MIC-10XG-SFPP)	12.1X46-D10	12.1X46-D10	
MIC with 20x1GE SFP Interfaces (SRX-MIC-20GE-SFP)	12.1X47-D10	12.1X47-D10	
Routing Engine SRX5K-RE-13-20 Specifications	12.1X46-D10	9.2	12.3X48
Routing Engine SRX5K-RE-1800X4 Specifications	12.1X47-D15	12.1X47-D15	
Routing Engine SRX5K-RE3-128G Specifications	19.3R1	19.3R1	

Figure 1 on page 7 is an interoperability matrix that describes the compatibility between various interface cards for the SRX5400, SRX5600, and SRX5800 Firewalls.

Figure 1: Interoperability Matrix for SRX5400, SRX5600, and SRX5800 Firewalls

Model Numbers	SRX5400 SRX5K-SCB SRX5K-RE-13-20	SRX5600/SRX5800 SRX5K-SCB SRX5K-RE-13-20	SRX5K-SCBE SRX5K-RE-1800X4	SRX5K-SCB3 SRX5K-RE-1800X4	SRX5K-SPC-2-10-40	SRX5K-SPC-4-15-320	SRX5K-SPC3	SRX5K-4XGE-XFP SRX5K-40GE-SFP SRX5K-FPC-IOC	SRX5K-MPC (SRX-MIC-20GE-SFP), (SRX-MIC-10XG-SFPP) (SRX-MIC-1X100G-CFP), (SRX-MIC-2X40G-QSFP)	SRX5K-MPC3-40G10G SRX5K-MPC3-100G10G	SRX5K-IOC4-10G SRX5K-IOC4-MRAT	SRX5600/SRX5800 SRX5K-SCB4 SRX5K-RE3-128G	SRX5600/SRX5800 SRX5K-SCB4 SRX5K-RE-1800X4	SRX5K-SCB3 SRX5K-RE3-128G
SRX5400 SRX5K-SCB SRX5K-RE-13-20	✓	✗	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗
SRX5600/SRX5800 SRX5K-SCB SRX5K-RE-13-20	✗	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗	✗
SRX5K-SCBE SRX5K-RE-1800X4	✗	✗	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗
SRX5K-SCB3 SRX5K-RE-1800X4	✗	✗	✗	✓	✗	✓	✓	✗	✓	✓	✓	✗	✗	✗
SRX5K-SPC-2-10-40	✗	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗	✗
SRX5K-SPC-4-15-320	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SRX5K-SPC3	✗	✗	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓
SRX5K-4XGE-XFP SRX5K-40GE-SFP SRX5K-FPC-IOC	✗	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗	✗
SRX5K-MPC (SRX-MIC-20GE-SFP) (SRX-MIC-10XG-SFPP) (SRX-MIC-1X100G-CFP) (SRX-MIC-2X40G-QSFP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SRX5K-MPC3-40G10G SRX5K-MPC3-100G10G	✗	✗	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓
SRX5K-IOC4-10G SRX5K-IOC4-MRAT	✗	✗	✗	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓
SRX5600/SRX5800 SRX5K-SCB4 SRX5K-RE3-128G	✗	✗	✗	✗	✗	✓	✓	✗	✓	✓	✓	✓	✗	✗
SRX5600/SRX5800 SRX5K-SCB4 SRX5K-RE-1800X4	✗	✗	✗	✗	✗	✓	✓	✗	✓	✓	✓	✗	✓	✗
SRX5K-SCB3 SRX5K-RE3-128G	✗	✗	✗	✗	✗	✓	✓	✗	✓	✓	✓	✗	✗	✓

g004198

CHAPTER 2

Services Processing Cards

IN THIS CHAPTER

Services Processing Cards Specifications

IN THIS SECTION

Services Processing Card SRX5K-SPC-2-10-40 Specifications

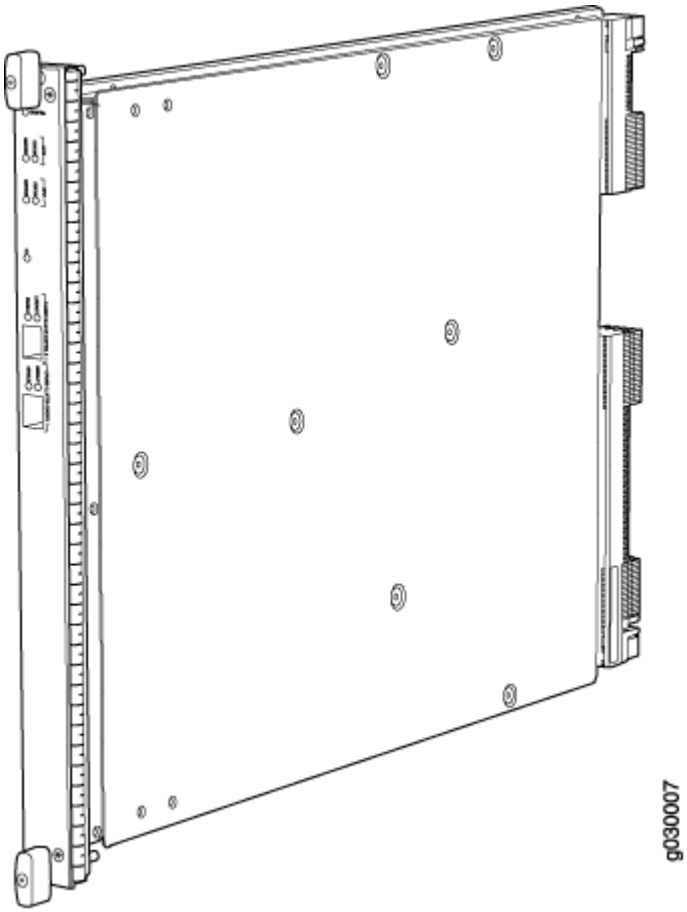
The SRX5K-SPC-2-10-40 Services Processing Card (SPC) contains two Services Processing Units (SPUs), which provide the processing power to run integrated services such as firewall, IPsec, and IDP (see Figure 2 on page 9). All traffic traversing the firewall is passed to an SPU to have services processing applied to it. Traffic is intelligently distributed by I/O cards (IOCs) to SPUs for services processing.

The firewall must have at least one SPC installed. You can install additional SPCs to increase services processing capacity.

You can install SPCs in any of the slots that are not reserved for Switch Control Boards (SCBs). If a slot is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the device.

Figure 2 on page 9 shows a typical SPC supported on the firewall.

Figure 2: Services Processing Card SRX5K-SPC-2-10-40



Each SPC consists of the following components:

- SPC cover, which functions as a ground plane and a stiffener.
- Two small form-factor pluggable (SFP) chassis cluster control ports for connecting multiple devices into a redundant chassis cluster. See *Chassis Cluster User Guide for SRX Series Devices* for more information about connecting and configuring redundant chassis clusters.

> ⚠ **CAUTION**: The Juniper Networks Technical Assistance Center (JTAC) provides complete support for Juniper-supplied optical modules and cables. However, JTAC does not provide support for third-party optical modules and cables that are not qualified or supplied by Juniper Networks. If you face a problem running a Juniper device that uses third-party optical modules or cables, JTAC may help you diagnose host-related issues if the observed issue is not, in the opinion of JTAC, related to the use of the third-party optical modules or cables. Your JTAC engineer will likely request

that you check the third-party optical module or cable and, if required, replace it with an equivalent Juniper-qualified component.

Use of third-party optical modules with high-power consumption (for example, coherent ZR or ZR+) can potentially cause thermal damage to or reduce the lifespan of the host equipment. Any damage to the host equipment due to the use of third-party optical modules or cables is the users' responsibility. Juniper Networks will accept no liability for any damage caused due to such use.

- Fabric interfaces.
- Two Gigabit Ethernet interfaces that allow control information, route information, and statistics to be sent between the Routing Engine and the CPU on the SPCs.
- Two interfaces from the SCBs that enable the boards to be powered on and controlled.
- Physical SPC connectors.
- Midplane connectors and power circuitry.
- Processor subsystem, which includes a 1.2-GHz CPU, system controller, and 1 GB of SDRAM.
- LEDs on the faceplate that indicate the SPC and SPU status.

Description	SPC with two SPUs
Software release	• Junos OS Release 9.2 and later
Cables and connectors	**CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**–SFP ports for control links in chassis cluster configurations. Supported SFP transceivers: 1000BASE-LH (model numbers SRX-SFP-1GE-LH, SRX-SFP-1GE-LH-ET) 1000BASE-LX (model numbers SRX-SFP-1GE-LX, SRX-SFP-1GE-LX-ET) 1000BASE-SX (model numbers SRX-SFP-1GE-SX, SRX-SFP-1GE-SX-ET)
Controls	None
Supported Slots	• SRX5600–Any slot, except the bottom slots **0** or **1** which are reserved for SCB/RE. • SRX5800–Any slot, except the slots **0** or **1** which are reserved for SCB/RE.

Power Requirement	Maximum 265 W
Weight	Approximately 13 lb (5.9 kg)

LEDs

OK/FAIL LED, one bicolor:

- Steady green–The SPC is operating normally.
- Red–The SPC has failed and is not operating normally.
- Off–The SPC is powered down.

STATUS LED, one tricolor for each of the two SPUs **SPU 0** and **SPU 1**:

- Green–The SPU is operating normally.
- Amber–The SPU is initializing.
- Red–The SPU has encountered an error or a failure.
- Off–The SPU is offline. If all four SPUs are offline, it is safe to remove the SPC from the chassis.

SERVICE LED, one bicolor for each of the two SPUs, **SPU 0** and **SPU 1**:

- Green–Service is running on the SPU under acceptable load.
- Amber–Service on the SPU is overloaded.
- Off–Service is not running on the SPU.

HA LED, one tricolor:

NOTE: The **HA** LED is lit only if the SPC has a control link, otherwise it is off.
Sometimes even after the control link is removed from the SPC, the **HA** LED would lit. Power cycle both the nodes to turn off the LED,

- Green (bold)–Clustering is operating normally. All cluster members and monitored links are available, and no error conditions are detected.
- Green (blinking)–Data transfer between the nodes.
- Red–A critical alarm is present on clustering. A cluster member is missing or unreachable, or the other node is no longer part of a cluster because it has been disabled by the dual membership and detection recovery process in reaction to a control link or fabric link failure.
- Amber–All cluster members are present, but an error condition has compromised the performance and resiliency of the cluster. The reduced bandwidth could cause packets to be dropped or could result in reduced resiliency because a single point of failure might exist. The error condition might be caused by:

- The loss of chassis cluster links which causes an interface monitoring failure.
- An error in an SPU or NPU.
- Failure of the spu-monitoring or cold-sync-monitoring processes.
- A chassis cluster IP monitoring failure.

LINK/ACT LED, one for each of the two ports **CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**:

- Green (flickering)–Chassis cluster control port link is active.
- Off–No link.

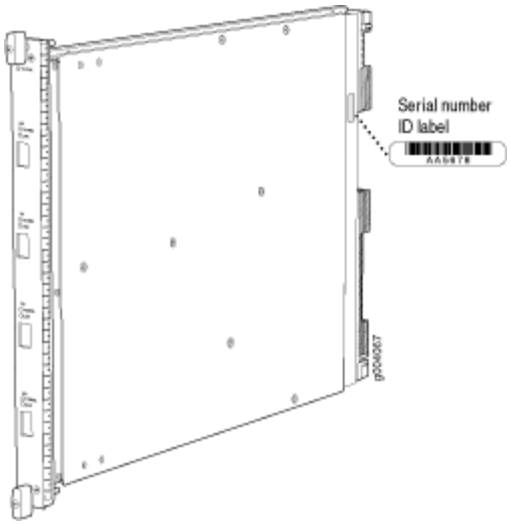
ENABLE LED, one for each of the two ports **CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**:

- Green–The chassis cluster control port is enabled.
- Off–The chassis cluster control port is disabled.

Serial Number Location

The serial number label is located as shown in Figure 3 on page 13.

Figure 3: Serial Number Label (IOC Shown, Other Cards Similar)



Services Processing Card SRX5K-SPC-4-15-320 Specifications

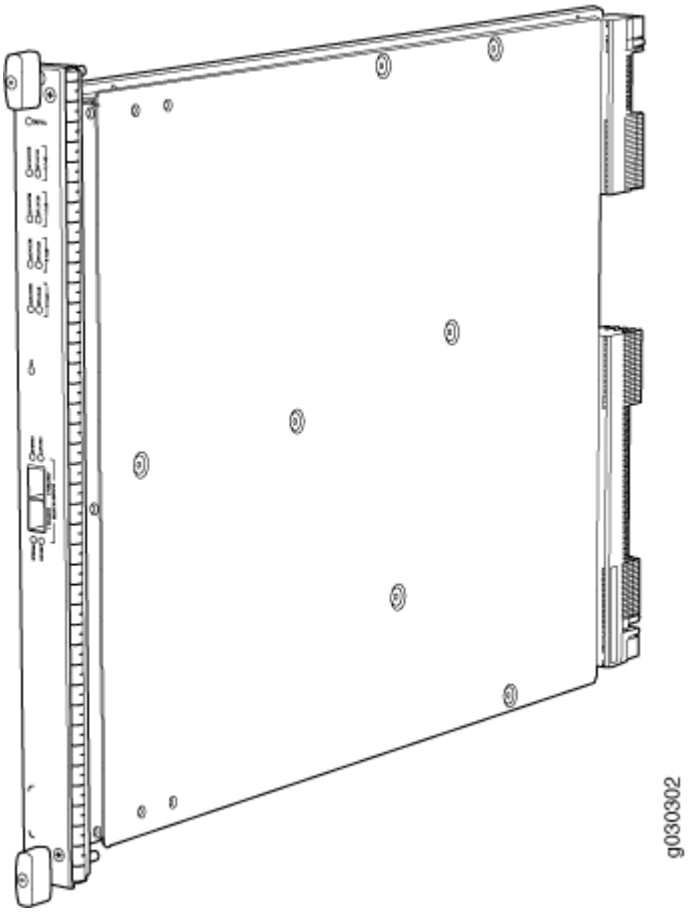
The SRX5K-SPC-4-15-320 Services Processing Card (SPC) contains four Services Processing Units (SPUs), which provide the processing power to run integrated services such as firewall, IPsec, and IDP (see Figure 4 on page 15). All traffic traversing the firewall is passed to an SPU to have services processing applied to it. Traffic is intelligently distributed by I/O cards (IOCs) to SPUs for services processing.

The firewall must have at least one SPC installed. You can install additional SPCs to increase services processing capacity.

You can install SPCs in any of the slots that are not reserved for Switch Control Boards (SCBs). If a slot is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the device.

If your firewall contains a mix of SRX5K-SPC-4-15-320 SPCs and earlier SRX5K-SPC-2-10-40 SPCs, an SRX5K-SPC-4-15-320 SPC must occupy the lowest-numbered slot of any SPC in the chassis. This configuration ensures that the center point (CP) function is performed by the faster and higher-performance SPC type.

Figure 4: Services Processing Card SRX5K-SPC-4-15-320



Each SPC consists of the following components:

- SPC cover, which functions as a ground plane and a stiffener.
- Two small form-factor pluggable (SFP) chassis cluster control ports for connecting multiple devices into a redundant chassis cluster. See *Chassis Cluster User Guide for SRX Series Devices* for more information about connecting and configuring redundant chassis clusters.

> **CAUTION**: The Juniper Networks Technical Assistance Center (JTAC) provides complete support for Juniper-supplied optical modules and cables. However, JTAC does not provide support for third-party optical modules and cables that are not qualified or supplied by Juniper Networks. If you face a problem running a Juniper device that uses third-party optical modules or cables, JTAC may help you diagnose host-related issues if the observed issue is not, in the opinion of JTAC, related to the use of the third-party optical modules or cables. Your JTAC engineer will likely request

that you check the third-party optical module or cable and, if required, replace it with an equivalent Juniper-qualified component.

Use of third-party optical modules with high-power consumption (for example, coherent ZR or ZR+) can potentially cause thermal damage to or reduce the lifespan of the host equipment. Any damage to the host equipment due to the use of third-party optical modules or cables is the users' responsibility. Juniper Networks will accept no liability for any damage caused due to such use.

- Fabric interfaces.
- Two Gigabit Ethernet interfaces that allow control information, route information, and statistics to be sent between the Routing Engine and the CPU on the SPCs.
- Two interfaces from the SCBs that enable the boards to be powered on and controlled.
- Physical SPC connectors.
- Midplane connectors and power circuitry.
- Processor subsystem, which includes a 1.2-GHz CPU, system controller, and 1 GB of SDRAM.
- LEDs on the faceplate that indicate the SPC and SPU status.

Description	SPC with four SPUs
Software release	• Junos OS Release 12.1X44-D10 and later
Cables and connectors	**CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**–SFP ports for control links in chassis cluster configurations. Supported SFP transceivers: 1000BASE-LH (model numbers SRX-SFP-1GE-LH, SRX-SFP-1GE-LH-ET) 1000BASE-LX (model numbers SRX-SFP-1GE-LX, SRX-SFP-1GE-LX-ET) 1000BASE-SX (model numbers SRX-SFP-1GE-SX, SRX-SFP-1GE-SX-ET)
Controls	None

Supported Slots	• SRX5400–Any slot, except the bottom slot **0** which is reserved for SCB/RE. • SRX5600–Any slot, except the bottom slots **0** or **1** which are reserved for SCB/RE. • SRX5800–Any slot, except the slots **0** or **1** which are reserved for SCB/RE.
Power Requirement	475 W typical, 585 W maximum **NOTE**: • In the SRX5600 and SRX5800 Firewalls, you must have high-capacity power supplies (either AC or DC) and high-capacity fan trays installed in the firewall in order to install and use SRX5K-SPC-4-15-320 SPCs. If you do not have high-capacity power supplies and fan trays installed, the firewall will log an alarm condition when it recognizes the SRX5K-SPC-4-15-320 SPCs. • On SRX5600 Firewalls with AC power supplies, we recommend that you use high-line (220v) input power to ensure the device has adequate power to support SRX5K-SPC-4-15-320 SPCs.
Weight	Approximately 18 lb (8.3 kg)

LEDs

OK/FAIL LED, one bicolor:

- Steady green–The SPC is operating normally.
- Red–The SPC has failed and is not operating normally.
- Off–The SPC is powered down.

STATUS LED, one tricolor for each of the four SPUs **SPU 0** through **SPU 3**:

- Green–The SPU is operating normally.
- Amber–The SPU is initializing.
- Red–The SPU has encountered an error or a failure.
- Off–The SPU is offline. If all four SPUs are offline, it is safe to remove the SPC from the chassis.

SERVICE LED, one bicolor for each of the four SPUs **SPU 0** through **SPU 3**:

- Green–Service is running on the SPU under acceptable load.
- Amber–Service on the SPU is overloaded.
- Off–Service is not running on the SPU.

HA LED, one tricolor:

- Green–Clustering is operating normally. All cluster members and monitored links are available, and no error conditions are detected.
- Red–A critical alarm is present on clustering. A cluster member is missing or unreachable, or the other node is no longer part of a cluster because it has been disabled by the dual membership and detection recovery process in reaction to a control-link or fabric-link failure.
- Amber–All cluster members are present, but an error condition has compromised the performance and resiliency of the cluster. The reduced bandwidth could cause packets to be dropped or could result in reduced resiliency because a single point of failure might exist. The error condition might be caused by:
  - The loss of chassis cluster links which causes an interface monitoring failure.
  - An error in an SPU or NPU.
  - Failure of the spu-monitoring or cold-sync-monitoring processes.

- A chassis cluster IP monitoring failure.

- Off–The node is not configured for clustering or it has been disabled by the dual membership and detection recovery process in reaction to a control link or fabric link failure.

LINK/ACT LED, one for each of the two ports **CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**:

- Green–Chassis cluster control port link is active.

- Off–No link.

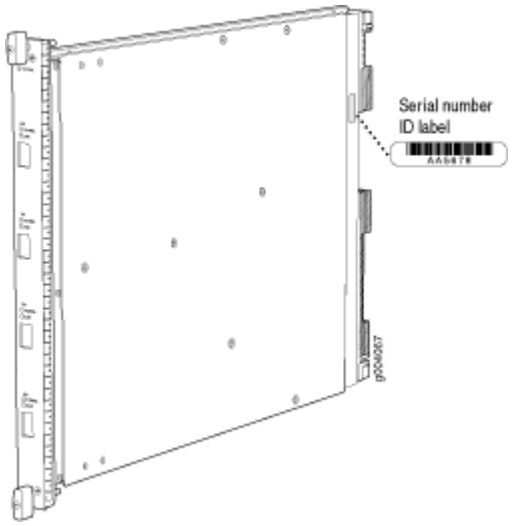
ENABLE LED, one for each of the two ports **CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**:

- Green–The chassis cluster control port is enabled.

- Off–The chassis cluster control port is disabled.

Serial Number Location	The serial number label is located as shown in Figure 5 on page 19.

Figure 5: Serial Number Label (IOC Shown, Other Cards Similar)



Services Processing Card SRX5K-SPC3 Specifications

The SRX5K-SPC3 Services Processing Card (SPC) contains two Services Processing Units (SPUs) with 128GB of memory per SPU, that provide the processing power to run integrated services such as firewall, IPsec, and IDP (see Figure 6 on page 20). All traffic traversing the firewall is passed to an SPU

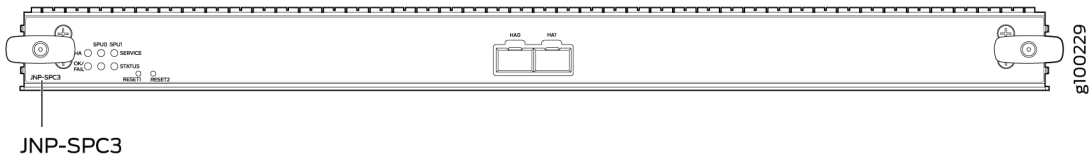
to have services processing applied to it. Traffic is intelligently distributed by I/O cards (IOCs) to SPUs for services processing.

The firewall must have at least one SPC installed. You can install additional SPCs to increase services processing capacity.

SPCs cannot be installed in slots that are reserved for Switch Control Boards (SCBs) or in slot **11** on the SRX5800. If a slot is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the device.

NOTE: Your firewall cannot have a mix of SRX5K-SPC-2-10-40 SPCs and SRX5K-SPC3 SPCs. Starting with Junos OS release 18.2R2 and then 18.4R1 but not 18.3R1, you can have a mix of SRX5K-SPC-4-15-320 SPCs and SRX5K-SPC3 SPCs.

Figure 6: Services Processing Card SRX5K-SPC3



Each SPC consists of the following components:

- SPC cover, which functions as a ground plane and a stiffener.
- Two 10–Gigabit Ethernet small form-factor pluggable plus (SFP+) chassis cluster control ports for connecting multiple devices into a redundant chassis cluster. See the *Chassis Cluster User Guide for SRX Series Devices* for more information about connecting and configuring redundant chassis clusters.

CAUTION: The Juniper Networks Technical Assistance Center (JTAC) provides complete support for Juniper-supplied optical modules and cables. However, JTAC does not provide support for third-party optical modules and cables that are not qualified or supplied by Juniper Networks. If you face a problem running a Juniper device that uses third-party optical modules or cables, JTAC may help you diagnose host-related issues if the observed issue is not, in the opinion of JTAC, related to the use of the third-party optical modules or cables. Your JTAC engineer will likely request that you check the third-party optical module or cable and, if required, replace it with an equivalent Juniper-qualified component.

> Use of third-party optical modules with high-power consumption (for example, coherent ZR or ZR+) can potentially cause thermal damage to or reduce the lifespan of the host equipment. Any damage to the host equipment due to the use of third-party optical modules or cables is the users' responsibility. Juniper Networks will accept no liability for any damage caused due to such use.

- Fabric interfaces
- One Gigabit Ethernet switch that provides control connectivity to the Routing Engine.
- Two interfaces from the SCBs that enable the boards to be powered on and controlled.
- Physical SPC connectors
- Midplane connectors and power circuitry.
- Processor subsystem, which includes a 2.3-GHz CPU, system controller, and two 128 GB solid state-drives (SSDs).
- LEDs on the faceplate that indicate the SPC and SPU status.

Description	SPC with two SPUs of 256 GB memory.
Software release	• Junos OS Release 18.2R1-S1
Cables and connectors	**HA0** and **HA1** SFP+ ports for control links in chassis cluster configurations. Supported transceivers: • 10GBASE–LR: transceiver model number SRX-SFP-10GE-LR • 10GBASE–SR: transceiver model number SRX-SFP-10GE-SR
Controls	None
Supported Slots	• SRX5400–Any slot, except the bottom slot **0** which is reserved for SCB/RE. • SRX5600–Any slot, except the bottom slots **0** or **1** which are reserved for SCB/RE. • SRX5800–Any slot, except slot **11**, and the slots **0** or **1** which are reserved for SCB/RE.

Power Requirement	650 W maximum **NOTE**: • In the SRX5600 and SRX5800 Firewalls, you must have high-capacity power supplies (either AC or DC) and high-capacity fan trays installed in the firewall in order to install and use SRX5K-SPC3 SPCs. If you do not have high-capacity power supplies and fan trays installed, the firewall will log an alarm condition when it recognizes the SRX5K-SPC3 SPCs. • On SRX5600 Firewalls with AC power supplies, we recommend that you use high-line (220v) input power to ensure the device has adequate power to support SRX5K-SPC3 SPCs.
Weight	Approximately 18 lb (8.3 kg)

LEDs

OK/FAIL LED, one bicolor:

- Steady green–The SPC is operating normally.
- Red–The SPC has failed and is not operating normally.
- Off–The SPC is powered down.

STATUS LED, one tricolor for each SPU **SPU 0** and **SPU 1**:

- Off–The SPU is offline.
- Blinking Amber–The SPU is initializing.
- Green–The SPU initialization is done and it is operating normally.
- Red–The SPU has encountered an error or a failure.

SERVICE LED, one tricolor for each SPU **SPU 0** and **SPU 1**:

- Off–The SPU is offline.
- Blinking Red–The SPU initialization is done.
- Blinking Amber–Service is initializing on the SPU.
- Green–Service is running on the SPU under acceptable load.
- Solid Red–Service encountered an error or a failure.

HA LED, one tricolor:

- Green–Clustering is operating normally. All cluster members and monitored links are available, and no error conditions are detected.
- Red–A critical alarm is present on clustering. A cluster member is missing or unreachable, or the other node is no longer part of a cluster because it has been disabled by the dual membership and detection recovery process in reaction to a control-link or fabric-link failure.
- Amber–All cluster members are present, but an error condition has compromised the performance and resiliency of the cluster. The reduced bandwidth could cause packets to be dropped or could result in reduced resiliency because a single point of failure might exist. The error condition might be caused by:
    - The loss of chassis cluster links which causes an interface monitoring failure.

  - An error in an SPU or NPU.
  - Failure of the spu-monitoring or cold-sync-monitoring processes.
  - A chassis cluster IP monitoring failure.
- Off–The node is not configured for clustering or it has been disabled by the dual membership and detection recovery process in reaction to a control link or fabric link failure.

LINK/ACT LED, one for each of the two ports **CHASSIS CLUSTER CONTROL 0** and **CHASSIS CLUSTER CONTROL 1**:

- Green–Chassis cluster control port link is active.
- Off–No link.

CHAPTER 3

I/O Cards

IN THIS CHAPTER

I/O Cards Specifications

IN THIS SECTION

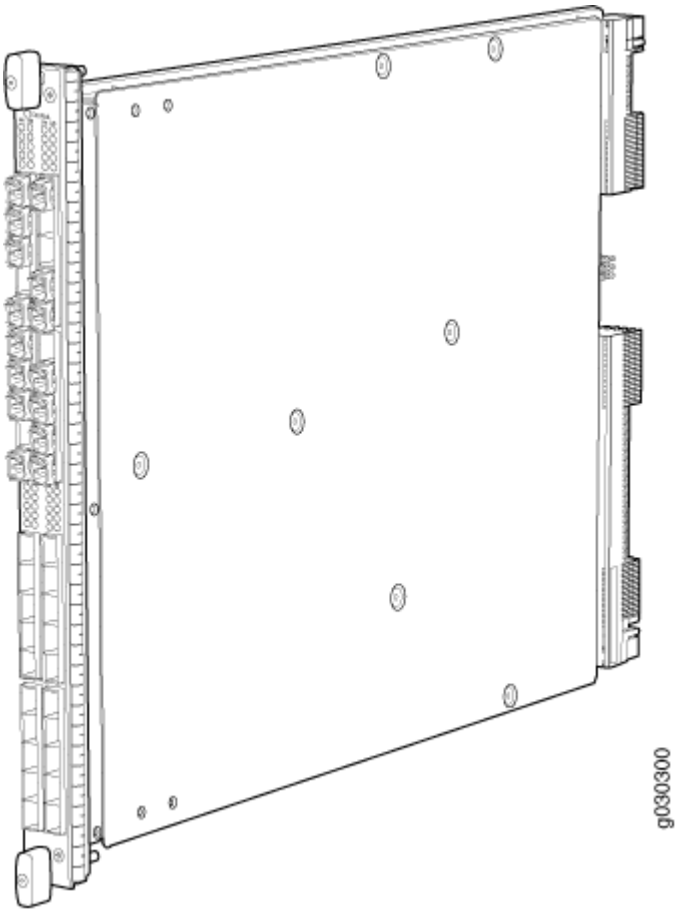
I/O Card SRX5K-40GE-SFP Specifications

The SRX5K-40GE-SFP I/O card (IOC) is optimized for Ethernet density and supports 40 Gigabit Ethernet ports (see Figure 7 on page 26). The IOC assembly combines packet forwarding and Ethernet interfaces on a single board, with four 10-Gbps Packet Forwarding Engines. Each Packet Forwarding Engine consists of one I-chip for Layer 3 processing and one Layer 2 network processor. The IOCs interface with the power supplies and Switch Control Boards (SCBs).

You must install at least one IOC in the firewall. The IOC can be of any of the available IOC or Flex IOC types.

You can install IOCs in any of the slots that are not reserved for Switch Control Boards (SCBs). If a slot is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

Figure 7: IOC SRX5K-40GE-SFP

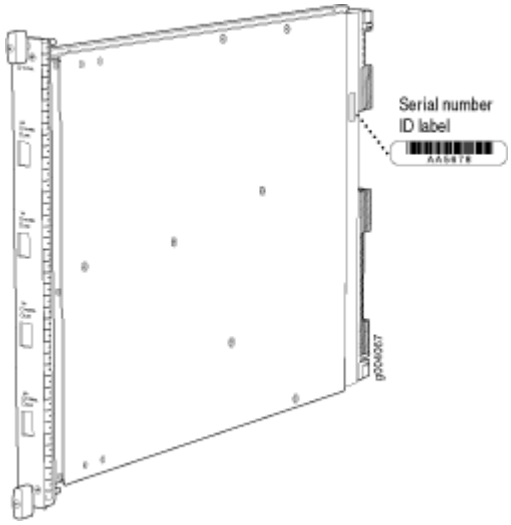


Description	• I/O card with 40 Gigabit Ethernet SFP ports • Maximum configurable MTU: 9192 bytes • Maximum throughput: 40 Gbps
Software release	• Junos OS Release 9.2 and later

Cables and connectors	40 Gigabit Ethernet SFP ports Supported SFP transceivers: 1000BASE-LH (model numbers SRX-SFP-1GE-LH, SRX-SFP-1GE-LH-ET) 1000BASE-LX (model numbers SRX-SFP-1GE-LX, SRX-SFP-1GE-LX-ET) 1000BASE-SX (model numbers SRX-SFP-1GE-SX, SRX-SFP-1GE-SX-ET) 1000BASE-T (model numbers SRX-SFP-1GE-T, SRX-SFP-1GE-T-ET)
Controls	None
Supported Slots	• SRX5600–Any slot except bottom slots **0** or **1** • SRX5800–Any slot except center slots **0**, **1**, or **2/6**
Power Requirement	312 W typical, 365 W maximum
Weight	Approximately 13 lb (5.9 kg)
LEDs	**OK/FAIL** LED, one bicolor: • Steady green–The IOC is operating normally. • Red–The IOC has failed and is not operating normally. • Off–The IOC is powered down.

Serial Number Location	The serial number label is located as shown in Figure 8 on page 28.

Figure 8: Serial Number Label (IOC Shown, Other Cards Similar)



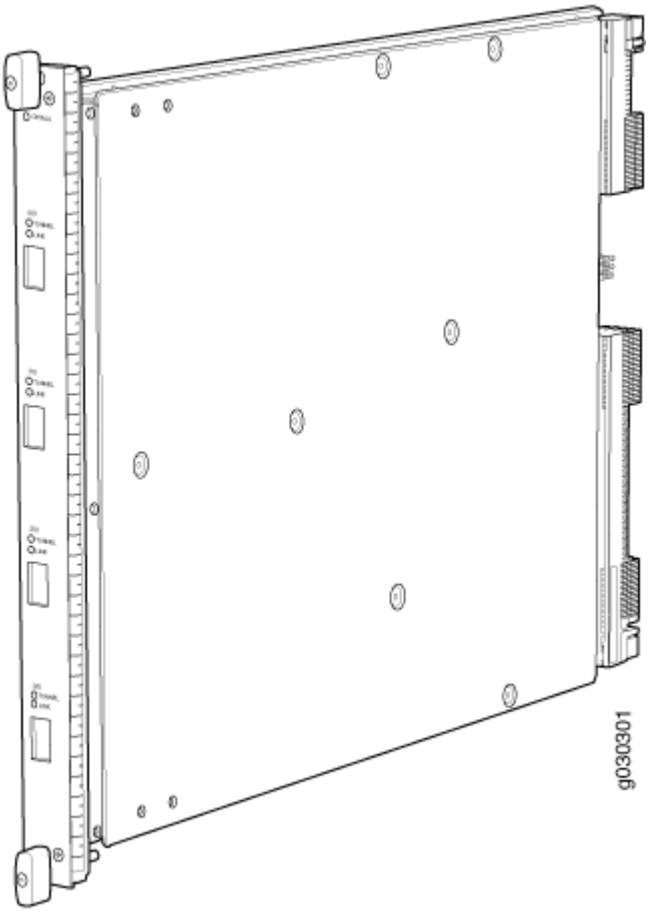
I/O Card SRX5K-4XGE-XFP Specifications

The SRX5K-4XGE-XFP I/O card (IOC) supports four 10-Gigabit Ethernet ports (see Figure 9 on page 29). The IOC assembly combines packet forwarding and Ethernet interfaces on a single board, with four 10-Gbps Packet Forwarding Engines. Each Packet Forwarding Engine consists of one I-chip for Layer 3 processing and one Layer 2 network processor. The IOCs interface with the power supplies and Switch Control Boards (SCBs).

You must install at least one IOC in the firewall. The IOC can be of any of the available IOC or Flex IOC types.

You can install IOCs in any of the slots that are not reserved for Switch Control Boards (SCBs). If a slot is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

Figure 9: IOC SRX5K-4XGE-XFP

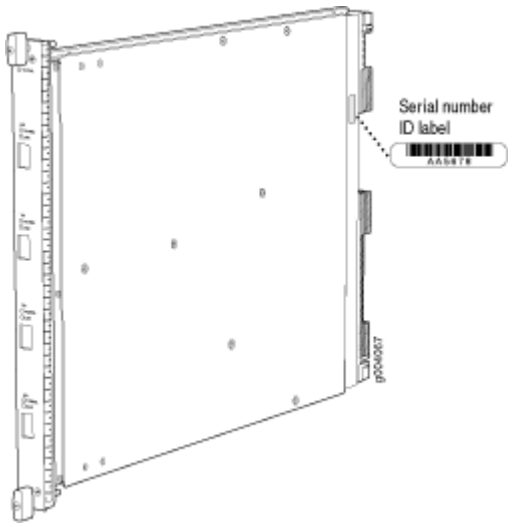


Description	• I/O card with four 10-Gigabit Ethernet XFP ports • Maximum configurable MTU: 9192 bytes • Maximum throughput: 40 Gbps
Software release	• Junos OS Release 9.2 and later

Cables and connectors	Four 10-Gbps XFP ports Supported XFP transceivers: 10GBASE-ER (model numbers SRX-XFP-10GE-ER and SRX-XFP-10GE-ER-ET) 10GBASE-LR (model numbers SRX-XFP-10GE-LR and SRX-XFP-10GE-LR-ET 10GBASE-SR (model numbers SRX-XFP-10GE-SR and SRX-XFP-10GE-SR-ET)
Controls	None
Supported Slots	• SRX5600–Any slot except bottom slots **0** or **1** • SRX5800–Any slot except center slots **0**, **1**, or **2**
Power Requirement	312 W typical, 365 W maximum
Weight	Approximately 13 lb (5.9 kg)
LEDs	**OK/FAIL** LED, one bicolor: • Steady green–The IOC is operating normally. • Red–The IOC has failed and is not operating normally. • Off–The IOC is powered down.

Serial Number Location	The serial number label is located as shown in Figure 10 on page 31.

Figure 10: SRX5K-4XGE-XFP Serial Number Label



CHAPTER 4

Flex I/O Cards and Port Modules

IN THIS CHAPTER

Flex I/O Cards and Port Modules Specifications

IN THIS SECTION

Flex I/O Card (SRX5K-FPC-IOC) Specifications

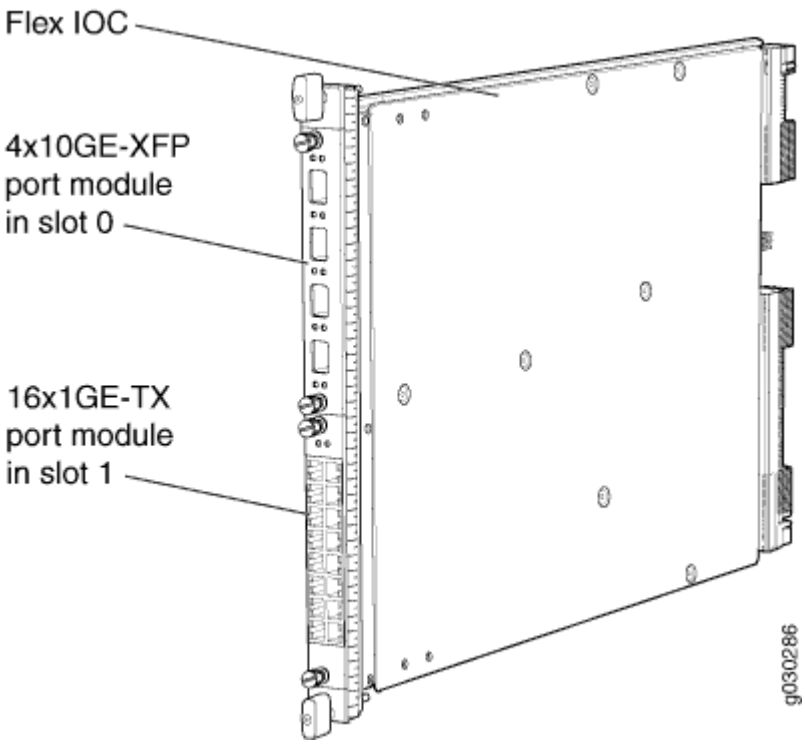
The SRX5K-FPC-IOC Flex I/O card (Flex IOC) (Figure 11 on page 33) is an IOC with two slots that accept port modules that add Ethernet ports to your firewall. A Flex IOC with installed port modules functions in the same way as a regular IOC, but allows greater flexibility in adding different types of Ethernet ports to your firewall.

Each Flex IOC has a processor subsystem, which includes a 1.2-GHz CPU, a system controller, 1 GB SDRAM, and two Packet Forwarding Engines with a maximum throughput of 10 Gbps each.

You must install at least one IOC in the firewall. The IOC can be of any of the available IOC or Flex IOC types.

You can install Flex IOCs in any of the slots that are not reserved for Switch Control Boards (SCBs). If a slot is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

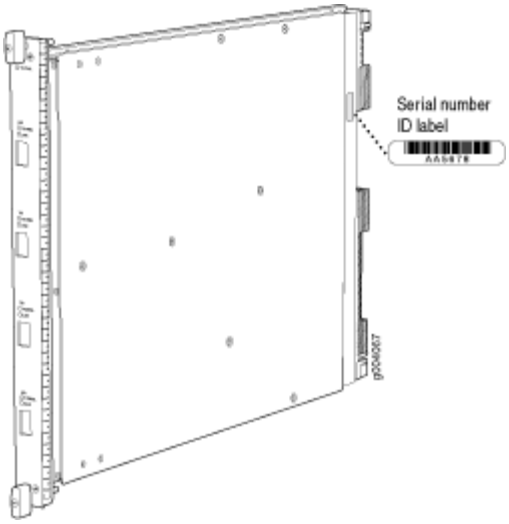
Figure 11: Flex IOC with Typical Port Modules



Description	• Flex IOC with slots for two port modules • Maximum throughput: 10 Gbps (per PFE)
Software release	• Junos OS Release 9.5R1 and later
Cables and connectors	Slots for two port modules
Controls	None
Supported Slots	• SRX5600–Any slot except bottom slots **0** or **1** • SRX5800–Any slot except center slots **0**, **1**, or **2/6**
Power Requirement	312 W typical, 365 W maximum (includes port modules)

Weight	Approximately 10 lb (4.5 kg)
LEDs	**OK/FAIL** LED, one bicolor: • Steady green–The Flex IOC is operating normally. • Red–The Flex IOC has failed and is not operating normally. • Off–The Flex IOC is powered down.
Serial Number Location	The serial number label is located as shown in Figure 12 on page 34.

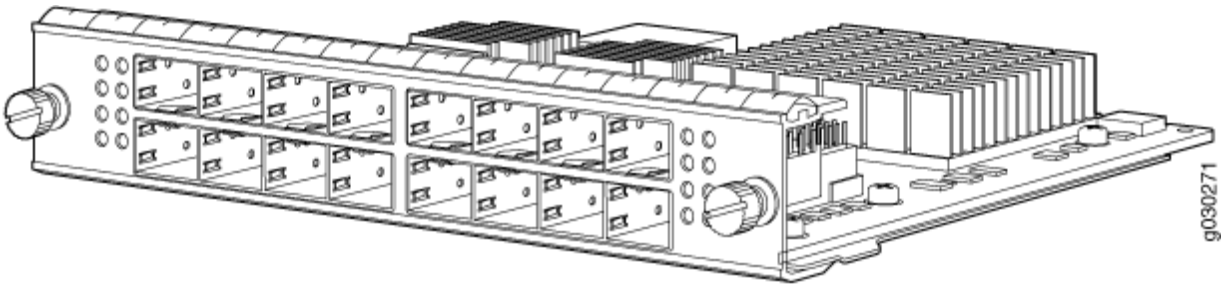
Figure 12: Serial Number Label (IOC Shown, Other Cards Similar)



Flex I/O Card Port Module SRX-IOC-16GE-SFP Specifications

You use port modules and Flex I/O Cards (Flex IOCs) to add different combinations of small form-factor pluggable transceiver (SFP), 10-gigabit SFP transceiver (XFP), and copper ports to your firewall to suit the specific needs of your network. The SRX-IOC-16GE-SFP port module (Figure 13 on page 35) installs into a Flex IOC to add sixteen 10/100/1000 Ethernet SFP ports.

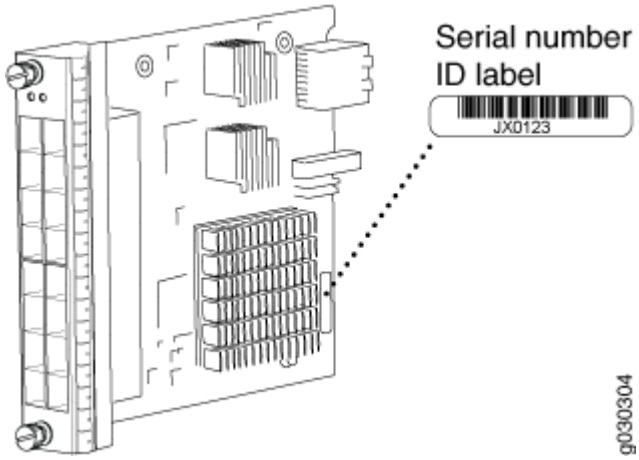
Figure 13: Flex IOC Port Module SRX-IOC-16GE-SFP



Description	• Port module with 16 Gigabit Ethernet SFP ports • Maximum throughput: 10 Gbps • Oversubscription ratio: 1.6:1 • Maximum configurable MTU: 9192 bytes
Software release	• Junos OS Release 9.5R1 and later
Cables and connectors	16 Gigabit Ethernet SFP ports Supported SFP transceivers: 1000BASE-LH (model numbers SRX-SFP-1GE-LH, SRX-SFP-1GE-LH-ET) 1000BASE-LX (model numbers SRX-SFP-1GE-LX, SRX-SFP-1GE-LX-ET) 1000BASE-SX (model numbers SRX-SFP-1GE-SX, SRX-SFP-1GE-SX-ET) 1000BASE-T (model numbers SRX-SFP-1GE-T, SRX-SFP-1GE-T-ET)
Controls	**ONLINE** Button–The **ONLINE** button on the port module front panel toggles the port module online and offline
Supported Slots	Either slot in SRX5K-FPC-IOC Flex IOC
Weight	Approximately 1.6 lb (0.7 kg)

LEDs	**OK/FAIL** LED, one bicolor: • Steady green–The port module is operating normally. • Red–The port module has failed and is not operating normally. • Off–The port module is powered down. **LINK** LED, single color, one per port: • Steady green–The link is active. • Off–No link. **TX/RX** LED, single color, one per port: • Blinking Green–The port is receiving or transmitting data. • Off–No activity.
Serial Number Location	The serial number label is located as shown in Figure 14 on page 36.

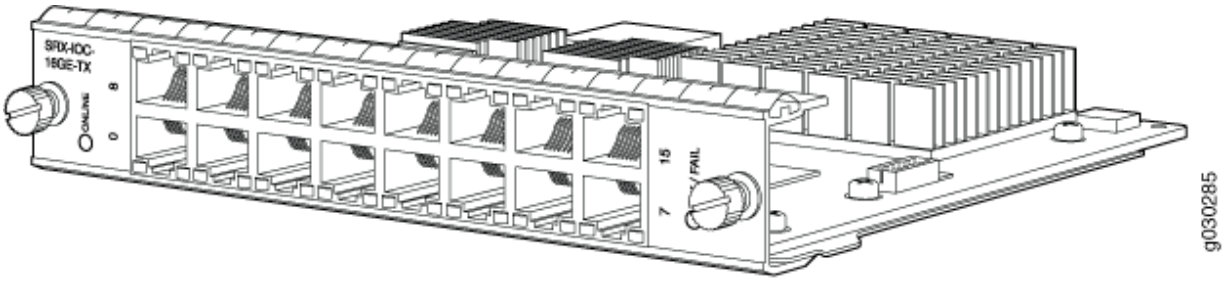
Figure 14: Port Module SRX-IOC-16GE-SFP Serial Number Label



Flex I/O Card Port Module SRX-IOC-16GE-TX Specifications

You use port modules and Flex I/O Cards (Flex IOCs) to add different combinations of small form-factor pluggable transceiver (SFP), 10-gigabit SFP transceiver (XFP), and copper ports to your firewall to suit the specific needs of your network. The SRX-IOC-16GE-TX port module (Figure 15 on page 37) installs into a Flex IOC to add sixteen 10/100/1000 Ethernet RJ-45 copper ports.

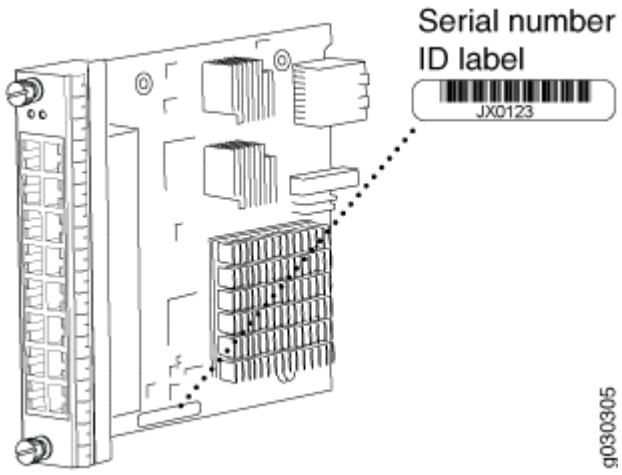
Figure 15: Flex IOC Port Module SRX-IOC-16GE-TX



Description	• Port module with sixteen 10/100/1000 Ethernet RJ45 ports • Maximum throughput: 10 Gbps • Oversubscription ratio: 1.6:1 • Maximum configurable MTU: 9192 bytes
Software release	• Junos OS Release 9.5R1 and later
Cables and connectors	Sixteen RJ-45 1-Gbps ports
Controls	**ONLINE** Button–The **ONLINE** button on the port module front panel toggles the port module online and offline.
Supported Slots	Either slot in SRX5K-FPC-IOC Flex IOC
Weight	Approximately 1.6 lb (0.7 kg)

LEDs	**OK/FAIL** LED, one bicolor: • Steady green–The port module is operating normally. • Red–The port module has failed and is not operating normally. • Off–The port module is powered down. **LINK** LED, single color, one per port: • Steady green–The link is active. • Off–No link. **TX/RX** LED, single color, one per port: • Blinking green–The port is receiving or transmitting data. • Off–No activity.
Serial Number Location	The serial number label is located as shown in Figure 16 on page 38.

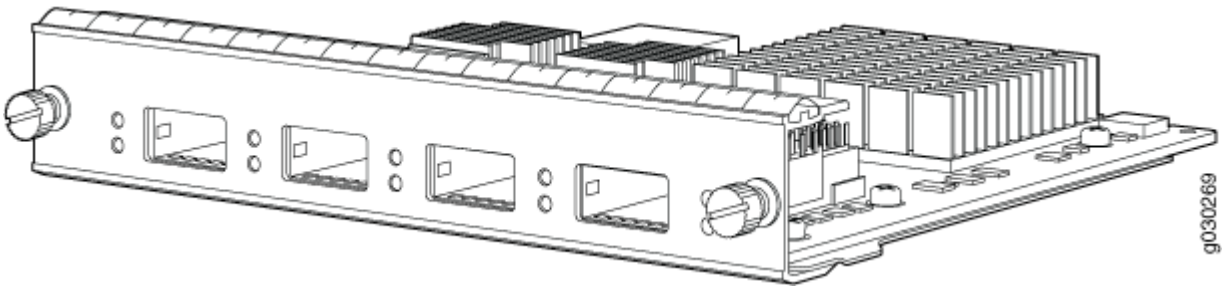
Figure 16: Port Module SRX-IOC-16GE-TX Serial Number Label



Flex I/O Card Port Module SRX-IOC-4XGE-XFP Specifications

You use port modules and Flex I/O Cards (Flex IOCs) to add different combinations of small form-factor pluggable transceiver (SFP), 10-gigabit SFP transceiver (XFP), and copper ports to your firewall to suit the specific needs of your network. The SRX-IOC-4XGE-XFP port module (Figure 17 on page 39) installs into a Flex IOC to add four 10-Gigabit Ethernet XFP ports.

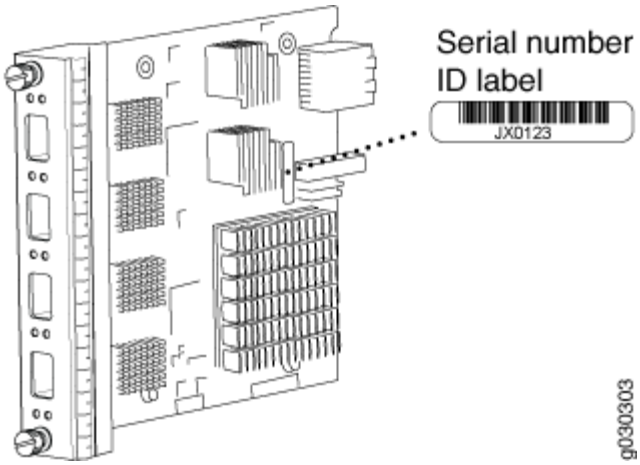
Figure 17: Flex IOC Port Module SRX-IOC-4XGE-XFP



Description	• Port module with four 10-Gigabit Ethernet XFP ports • Maximum throughput: 10 Gbps • Oversubscription ratio: 4:1 • Maximum configurable MTU: 9192 bytes
Software release	• Junos OS Release 9.5R1 and later
Cables and connectors	4 XFP Ethernet ports Supported XFP transceivers: 10GBASE-ER (model numbers SRX-XFP-10GE-ER and SRX-XFP-10GE-ER-ET) 10GBASE-LR (model numbers SRX-XFP-10GE-LR and SRX-XFP-10GE-LR-ET 10GBASE-SR (model numbers SRX-XFP-10GE-SR and SRX-XFP-10GE-SR-ET)
Controls	**ONLINE** Button–The **ONLINE** button on the port module front panel toggles the port module online and offline
Supported Slots	Either slot in SRX5K-FPC-IOC Flex IOC
Weight	Approximately 1.6 lb (0.7 kg)

LEDs	**OK/FAIL** LED, one bicolor: • Steady green–The port module is operating normally. • Red–The port module has failed and is not operating normally. • Off–The port module is powered down. **LINK** LED, single color, one per port: • Steady green–The link is active. • Off–No link.
Serial Number Location	The serial number label is located as shown in Figure 18 on page 40.

Figure 18: Port Module SRX-IOC-4XGE-XFP Serial Number Label



CHAPTER 5

Modular Port Concentrators and Interface Cards

IN THIS CHAPTER

Modular Port Concentrators and Interface Cards Specifications

IN THIS SECTION

Modular Port Concentrator (SRX5K-MPC) Specifications

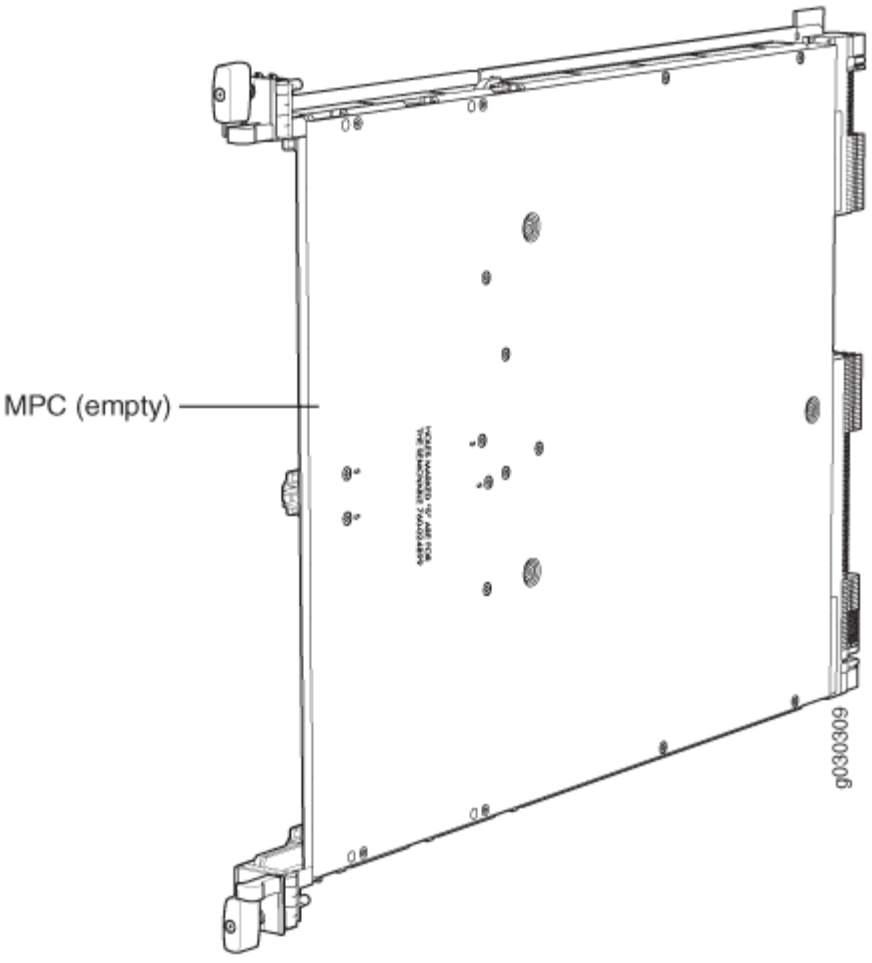
The SRX5K-MPC (see Figure 19 on page 42) is an interface card with two slots that accept MICs. These MICs add Ethernet ports to your firewall. An MPC with MICs installed functions in the same way as a regular IOC but allows you to add different types of Ethernet ports to your firewall. MPCs and MICs are similar in form and function to Flex IOCs and port modules. However, the two use different form-factors, so you cannot install port modules in an MPC, nor can you install MICs in a Flex IOC.

You must install at least one interface card in the firewall. The interface card can be of any of the available IOC, Flex IOC, or MPC types. You can add just one MIC; or you can add two MICs of the same or different types.

You can install MPCs in any of the slots that are not reserved for Switch Control Boards (SCBs).

If a slot in the SRX5400, SRX5600, or SRX5800 Firewall card cage is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall. If a slot in an MPC is not occupied by a MIC, you must install a blank panel in the empty MIC slot to shield it and to allow cooling air to circulate properly through the MPC.

Figure 19: SRX5K-MPC



NOTE: When installing an SRX5K-MPC in an SRX5600 or SRX5800 Firewall:

- If the session-distribution-mode has not been explicitly configured using the CLI command:

  user@host **set security forwarding-process application-services session-distribution-mode**

  The SRX5K-MPC defaults to hash-based mode automatically even if existing SRX5K-MPC or non-MPCs are installed. You cannot set the session-distribution-mode to normal.

- If the session-distribution-mode has been explicitly configured to normal, and the MIC is installed in the device, then the SRX5K-MPC will remain offline, and the firewall generates a major alarm and logs the event for troubleshooting. You must explicitly configure the session-distribution-mode using the CLI command:

  user@host **set security forwarding-process application-services session-distribution-mode hash-based**

When installing an SRX5K-MPC in an SRX5400 Firewall, the session-distribution-mode will only function when hash-based mode is configured or set as the default. The normal mode is not supported.

A 9% drop is observed for PPS (throughput) when moving from session mode to hash mode (for SRX5K-MPC or non-MPCs), whereas no drop in performance is observed on CPS (connection per second) and session capacity numbers.

For more information about the CLI command, see the Junos OS documentation at www.juniper.net/documentation/.

Description	• MPC with slots for two MICs • Maximum throughput: 75 Gbps per slot from Junos OS Release 12.1X46-D10 and later 120 Gbps per slot from Junos OS Release 12.1x47-D15 and later
Software release	Junos OS Release 12.1x46-D10
Cables and connectors	Slots for two MICs
Controls	One ejector knob each for MIC slots **0** and **1**. Pull the ejector knob to unseat and partially eject the adjacent MIC.

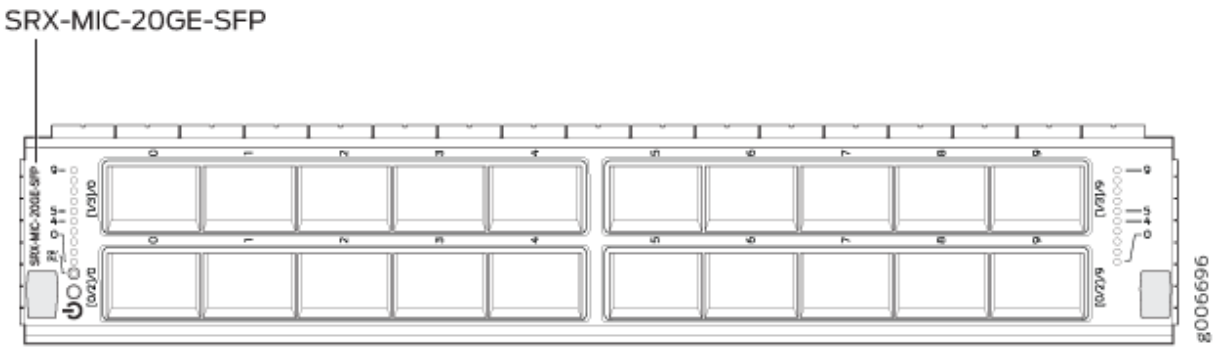
Supported slots	• SRX5400–Any slot except bottom slot **0** • SRX5600–Any slot except bottom slots **0** or **1** • SRX5800–Any slot except center slots **0** or **1**
Power requirement	Maximum of 570 W for the MPC with two MICs, including applicable transceivers. **NOTE**: • To install and use SRX5K-MPCs in the SRX5600 and SRX5800 Firewalls, you must have high-capacity power supplies (either AC or DC) and high-capacity fan trays installed in the firewalls. All models of SRX5400 Firewalls already include high-capacity supplies. If you do not have high-capacity power supplies and fan trays installed, the firewall will log an alarm condition when it recognizes the SRX5K-MPCs. • On SRX5400 and SRX5600 Firewalls with AC power supplies, we recommend that you use high-line (220 V) input power to ensure that the devices have adequate power to support SRX5K-MPCs.
Weight	Approximately 10 lb (4.5 kg) without MICs
LEDs	**OK/FAIL** LED, one bicolor: • Green–The MPC is operating normally. • Blinking green–The MPC is transitioning to online or offline. • Red–The MPC has failed and is not operating normally. • Off–The MPC is powered down.
Serial number location	The serial number label is yellow and is located on the opposite side of the card.

MIC with 20x1GE SFP Interfaces (SRX-MIC-20GE-SFP)

You use Modular Interface Cards (MICs) and Modular Port Concentrators (MPCs) to add different combinations of Ethernet interfaces to your firewall to suit the specific needs of your network.

The SRX-MIC-20GE-SFP MIC (see Figure 20 on page 45) can be installed in the SRX-5K MPC to add twenty 1-Gigabit Ethernet small form-factor pluggable (SFP) Ethernet ports.

Figure 20: SRX-MIC-20GE-SFP



Description	• MIC with twenty 1-Gigabit Ethernet SFP Ethernet ports • Fits into either of the two slots of SRX-5K-MPC • Supports up to 20 Gbps of full-duplex traffic • Maximum configurable MTU: 9192 bytes • Maximum throughput: 20 Gbps
Software release	Junos OS Release 12.1X47-D10
Cables and connectors	Sockets for 20 SFP Gigabit Ethernet transceivers. Supported SFP transceivers: 1000BASE-LX (model numbers SRX-SFP-1GE-LX, SRX-SFP-1GE-LX-ET) 1000BASE-SX (model numbers SRX-SFP-1GE-SX, SRX-SFP-1GE-SX-ET) 1000BASE-T (model numbers SRX-SFP-1GE-T, SRX-SFP-1GE-T-ET)
Weight	Approximately 1.2 lb (0.54 kg)

LEDs	**OK/FAIL** LED, one bicolor: • Green–MIC is operating normally. • Red–MIC has failed. • Off–MIC is powered down. **LINK** LED, single color, one per SFP port: • Green–Link is active. • Off–Link is inactive.

Port and Interface Numbering

Each MPC accepts up to two MICs. SRX-MIC-20GE-SFP is a 20-port Gigabit Ethernet MIC with SFP.

Each port on a MIC corresponds to a unique interface name in the CLI.

In the syntax of an interface name, a hyphen (-) separates the media type from the *MPC* number (represented as an FPC in the CLI). The MPC slot number corresponds to the first number in the interface. The second number in the interface corresponds to the logical PIC number. The last number in the interface matches the port number on the MIC. Slashes (/) separate the MPC number from the logical PIC number and port number:

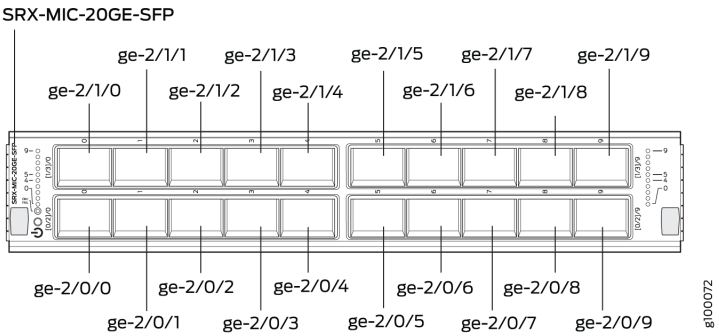
type-*fpc*/*pic*/*port*

- *type*—Media type, which identifies the network device. For example:
  - ge—Gigabit Ethernet interface
  - so—SONET/SDH interface
  - xe—10-Gigabit Ethernet interface

  For a complete list of media types, see Interface Naming Overview.
- *fpc*—Slot in which the MPC is installed in an SRX5400, SRX5600, or SRX5800 Firewall.
- *pic*—Two Logical PICs on the *MIC*, numbered 0 or 1 when installed in the first slot, and 2 or 3 when installed in the second slot.
- *port*—Port number.

Figure 21 on page 48 shows the SRX-MIC-20GE-SFP MIC installed in slot **0** of an MPC in slot 2 of an SRX5400, SRX5600, or SRX5800 Firewall.

Figure 21: SRX-MIC-20GE-SFP Interface Port Mapping



The SRX-MIC-20GE-SFP MIC contains two logical PICs, numbered `PIC 0` through `PIC 1` in the CLI. Each logical PIC contains 10 ports numbered **0** through **9**.

The sample output of the `show chassis fpc pic-status` command output displays two 20-port Gigabit Ethernet MICs with SFP — inserted into the slots of an MPC in slot `2`.

The logical PICs of the two MICs— `10x 1GE(LAN) SFP` — are shown as `PIC 0`, `PIC 1`, `PIC 2`, and `PIC 3`.

```
user@host> show chassis hardware
node1:
--------------------------------------------------------------------
------
Slot 1   Online       SRX5k SPC II
  PIC 0  Online       SPU Cp
  PIC 1  Online       SPU Flow
  PIC 2  Online       SPU Flow
  PIC 3  Online       SPU Flow
Slot 2   Online       SRX5k IOC II
  PIC 0  Online       10x 1GE(LAN) SFP
  PIC 1  Online       10x 1GE(LAN) SFP
  PIC 2  Online       10x 1GE(LAN) SFP
  PIC 3  Online       10x 1GE(LAN) SFP

{primary:node1}
```

The `show interfaces terse` command output displays the Gigabit Ethernet interfaces that correspond to all the ports located on the two MICs.

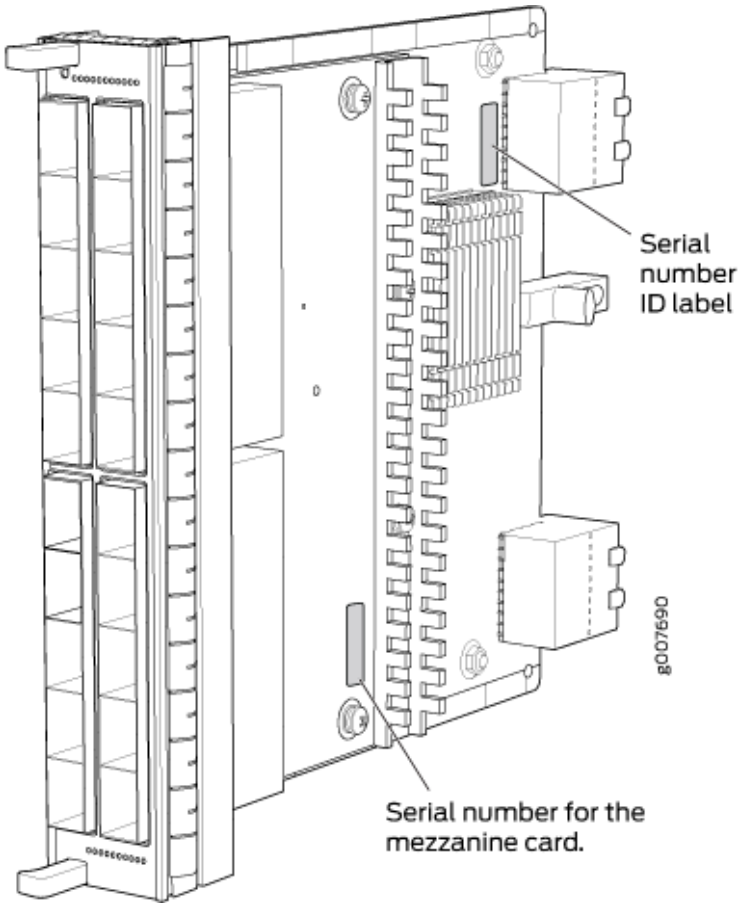
```
user@host> show interfaces terse

Interface               Admin Link Proto    Local
Remote
gr-0/0/0                up    up
ip-0/0/0                up    up
lt-0/0/0                up    up
ge-2/0/0                up    up
ge-2/0/1                up    down
ge-2/0/2                up    down
ge-2/0/3                up    down
ge-2/0/4                up    down
ge-2/0/5                up    up
ge-2/0/6                up    down
ge-2/0/7                up    down
ge-2/0/8                up    up
ge-2/0/9                up    up
ge-2/1/0                up    down
ge-2/1/1                up    up
ge-2/1/2                up    down
ge-2/1/3                up    down
ge-2/1/4                up    up
ge-2/1/5                up    down
ge-2/1/6                up    down
ge-2/1/7                up    down
ge-2/1/8                up    up
ge-2/1/9                up    up
ge-2/2/0                up    down
ge-2/2/1                up    down
ge-2/2/2                up    down
ge-2/2/3                up    down
ge-2/2/4                up    down
ge-2/2/5                up    down
ge-2/2/6                up    down
ge-2/2/7                up    down
ge-2/2/8                up    down
ge-2/2/9                up    down
ge-2/3/0                up    down
ge-2/3/1                up    down
ge-2/3/2                up    down
ge-2/3/3                up    down
ge-2/3/4                up    down
ge-2/3/5                up    down
ge-2/3/6                up    down
ge-2/3/7                up    down
```

```
ge-2/3/8                up    down
ge-2/3/9                up    down
```

Serial number location	The serial number label is yellow and is located as shown in Figure 22 on page 50.

Figure 22: SRX-MIC-20GE-SFP Serial Number Label

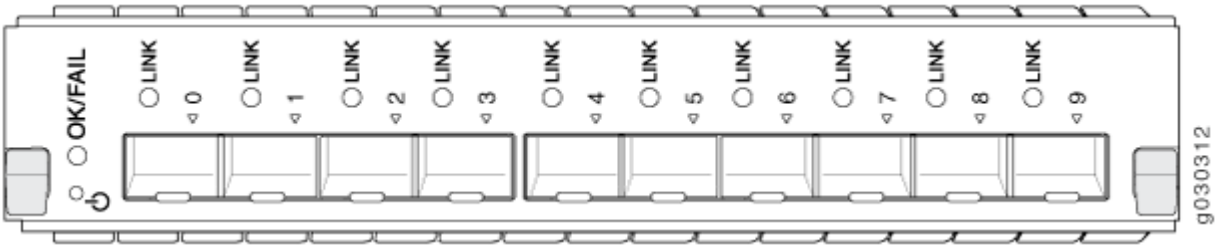


NOTE: The serial number for the mezzanine card is shown only for reference and is never used for any purpose.

MIC with 10x10GE SFP+ Interfaces (SRX-MIC-10XG-SFPP)

You use MICs and MPCs to add different combinations of Ethernet interfaces to your firewall to suit the specific needs of your network. The SRX-MIC-10XG-SFPP (see Figure 23 on page 51) can be installed in an MPC to add ten 10-Gigabit Ethernet SFP+ ports.

Figure 23: SRX-MIC-10XG SFPP



Description	• MIC with ten SFP+ 10-Gigabit Ethernet ports • Fits into MPC • Supports up to 100 Gbps of full-duplex traffic • Maximum configurable MTU: 9192 bytes • Maximum throughput: 100 Gbps
Software release	Junos OS Release 12.1X46-D10
Cables and connectors	Sockets for ten 10-Gbps SFP+ transceivers See Hardware Compatibility Tool for the transceivers supported.
Supported slots	Either slot in SRX5K-MPC
Weight	Approximately 1.6 lb (0.7 kg)
LEDs	**OK/FAIL** LED, one bicolor: • Green–The MIC is operating normally. • Red–The MIC has failed and is not operating normally. • Off–The MIC is powered down. **LINK** LED, single color: • Green–The link is active. • Off–No link.

Port and Interface Numbering

Each port on a MIC corresponds to a unique interface name in the CLI.

In the syntax of an interface name, a hyphen (-) separates the media type from the *MPC* number (represented as an FPC in the CLI). The MPC slot number corresponds to the first number in the interface. The second number in the interface corresponds to the logical PIC number. The last number in the interface matches the port number on the MIC. Slashes (/) separate the MPC number from the logical PIC number and port number:

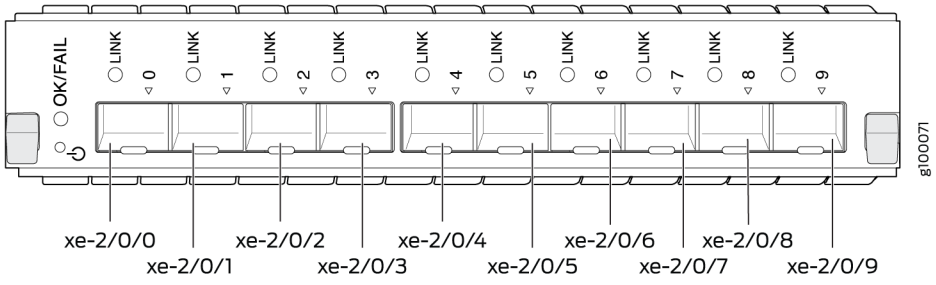
type-fpc/pic/port

- *type*—Media type, which identifies the network device. For example:
  - ge—Gigabit Ethernet interface
  - so—SONET/SDH interface
  - xe—10-Gigabit Ethernet interface

  For a complete list of media types, see Interface Naming Overview.
- *fpc*—Slot in which the MPC is installed in an SRX5400, SRX5600, or SRX5800 Firewall.
- *pic*—Logical PIC on the *MIC*, numbered 0 when installed in the first slot or 2 when installed in the second slot.
- *port*—Port number.

Figure 24 on page 52 shows the port and interface numbering of an SRX-MIC-10XG-SFPP MIC when it is installed in slot **0** of an MPC in slot 2 of an SRX5400, SRX5600, or SRX5800 Firewall.

Figure 24: SRX-MIC-10XG-SFPP Port and Interface Numbering



The SRX-MIC-10XG-SFPP MIC contains one logical PIC, numbered PIC 0 in the CLI when inserted in the first slot of the MPC or PIC 2 when inserted in the second slot of the MPC. Each logical PIC contains 10 ports numbered **0** through **9**.

The sample output of the `show chassis fpc pic-status` command displays two 10-port 10-Gigabit Ethernet MICs with SFP+ — inserted into the slots of an MPC in slot `2`.

The logical PICs of the two MICs— `10x 10GE SFP+` — are shown as `PIC 0` and `PIC 2`.

```
user@host> show chassis fpc pic-status

Slot 1   Online       SRX5k SPC II
  PIC 0  Online       SPU Cp
  PIC 1  Online       SPU Flow
  PIC 2  Online       SPU Flow
  PIC 3  Online       SPU Flow
Slot 2   Online       SRX5k IOC II
  PIC 0  Online       10x 10GE SFP+
  PIC 2  Online       10x 10GE SFP+
```

The `show interfaces terse` command output displays the 10–Gigabit Ethernet interfaces that correspond to the 10 ports located on each MIC.

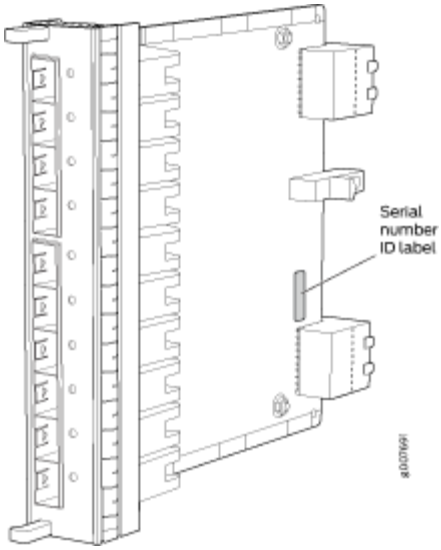
```
user@host> show interfaces terse

Interface               Admin Link Proto    Local                 Remote
gr-0/0/0                up    up
ip-0/0/0                up    up
lt-0/0/0                up    up
xe-2/0/0                up    up
xe-2/0/1                up    up
xe-2/0/2                up    up
xe-2/0/2.0              up    up   inet     131.131.131.2/24
                                   inet6    1300::2/64
                                            fe80::224:dcff:fe20:b94c/64
                                   multiservice
xe-2/0/3                up    up
xe-2/0/4                up    up
xe-2/0/5                up    up
xe-2/0/6                up    up
xe-2/0/6.0              up    up   inet     141.141.141.1/24
                                   inet6    1400::1/64
                                            fe80::224:dcff:fe20:b950/64
                                   multiservice
xe-2/0/7                up    down
xe-2/0/8                up    down
xe-2/0/9                up    down
xe-2/2/0                up    down
xe-2/2/1                up    down
xe-2/2/2                up    down
```

```
xe-2/2/3                up    down
xe-2/2/4                up    down
xe-2/2/5                up    down
xe-2/2/6                up    down
xe-2/2/7                up    down
xe-2/2/8                up    down
xe-2/2/9                up    down
```

Serial number location	The serial number label is yellow and located as shown in Figure 25 on page 54.

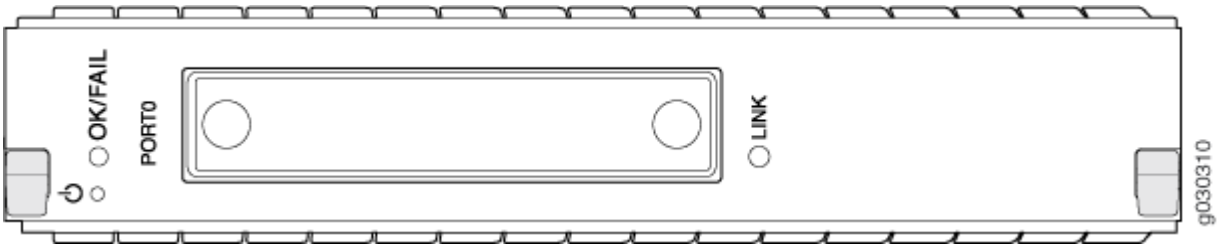
Figure 25: SRX-MIC-10XG-SFPP Serial Number Label



MIC with 1x100GE CFP Interface (SRX-MIC-1X100G-CFP)

You use MICs and MPCs to add different combinations of Ethernet interfaces to your firewall to suit the specific needs of your network. The SRX-MIC-1X100G-CFP (see Figure 26 on page 55) can be installed in an MPC to add one 100-Gigabit Ethernet CFP port.

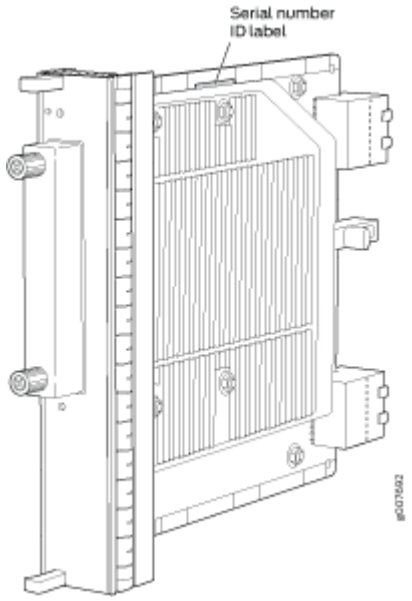
Figure 26: SRX-MIC-1X100G-CFP



Description	• MIC with one CFP 100-Gigabit Ethernet port • Fits into MPC • Supports up to 100 Gbps of full-duplex traffic • Maximum configurable MTU: 9192 bytes • Maximum throughput: 100 Gbps
Software release	Junos OS Release 12.1X46-D10
Cables and connectors	One socket for a 100-Gigabit CFP transceiver. Supported CFP transceivers: • 100GBASE-LR4 (model number: SRX-CFP-100G-LR4) • 100GBASE-SR10 (model number: SRX-CFP-100G-SR10)
Supported slots	Either slot in SRX5K-MPC
Weight	Approximately 1.6 lb (0.7 kg)

LEDs	**OK/FAIL** LED, one bicolor: • Green–The MIC is operating normally. • Red–The MIC has failed and is not operating normally. • Off–The MIC is powered down. **LINK** LED, single color: • Green–The link is active. • Off–No link.
Serial number location	The serial number label is yellow and located as shown in Figure 27 on page 56.

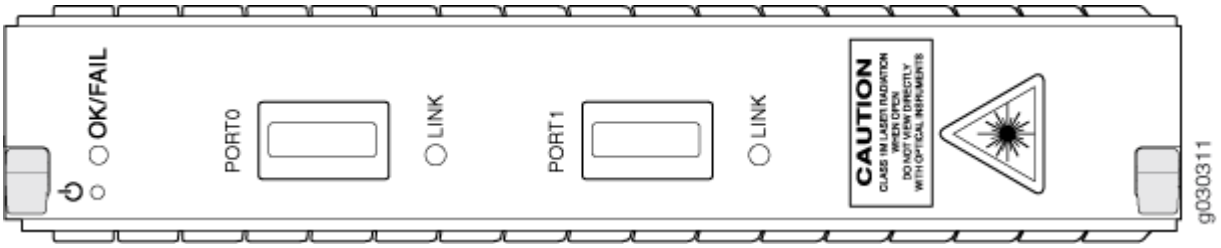
Figure 27: SRX-MIC-1X100G-CFP Serial Number Label



MIC with 2x40GE QSFP+ Interfaces (SRX-MIC-2X40G-QSFP)

You use MICs and MPCs to add different combinations of Ethernet interfaces to your firewall to suit the specific needs of your network. The SRX-MIC-2X40G-QSFP (see Figure 28 on page 57) can be installed in an MPC to add two 40-Gigabit quad small form-factor pluggable (QSFP+) Ethernet ports.

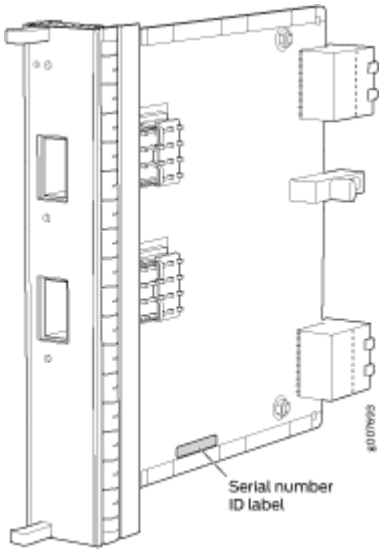
Figure 28: SRX-MIC-2X40G QSFP



Description	• MIC with two QSFP+ Ethernet ports • Fits into MPC • Supports up to 80 Gbps of full-duplex traffic • Maximum configurable MTU: 9192 bytes • Maximum throughput: 80 Gbps
Software release	Junos OS Release 12.1X46-D10
Cables and connectors	Sockets for two QSFP+ 40-Gigabit Ethernet fiber-optic transceivers. Supported QSFP+ transceiver: 40GBASE-SR4 (model number SRX-QSFP-40G-SR4) 40GBASE-LR4 (model number SRX-QSFP-40G-LR4)
Supported slots	Either slot in SRX5K-MPC
Weight	Approximately 1.6 lb (0.7 kg)

LEDs	**OK/FAIL** LED, one bicolor: • Green–The MIC is operating normally. • Red–The MIC has failed and is not operating normally. • Off–The MIC is powered down. **LINK** LED, single color, one per QSFP+ port: • Green–The link is active. • Off–No link.
Serial number location	The serial number label is yellow and typically located as shown in Figure 29 on page 58.

Figure 29: SRX-MIC-2X40G-QSFP Serial Number Label



SRX5K-MPC3-40G10G Specifications

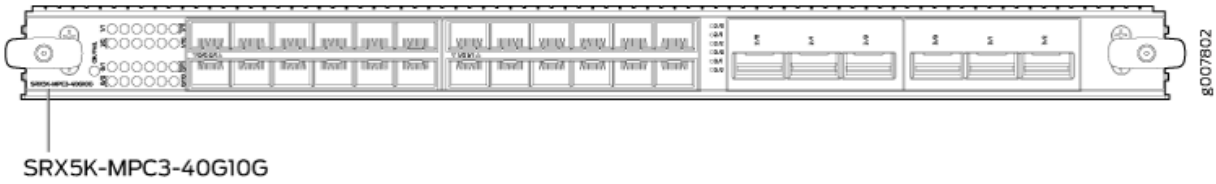
The SRX5K-MPC3-40G10G (IOC3) is an interface card that provides 10 Gigabit Ethernet and 40 Gigabit Ethernet interfaces, with a Packet Forwarding Engine that provides a 240 Gbps line rate. This interface card is supported on SRX5400, SRX5600, and SRX5800 Firewalls. See Figure 30 on page 59.

NOTE: These cards do not support plug-in Modular Interface Cards (MICs).

All ports on the interface card have dual-color LEDs for reporting link status.

The interface card also supports hot-pluggable optical modules.

Figure 30: SRX5K-MPC3-40G10G



If a slot in the SRX5400, SRX5600, or SRX5800 Firewall card cage is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

Description	• Fixed-configuration MPC with six 40-Gigabit Ethernet ports and twenty-four 10-Gigabit Ethernet ports • Maximum throughput: 240 Gbps • Maximum configurable MTU: 9192 bytes
Software release	Junos OS Release 15.1X49-D10 and later
Supported Slots	• SRX5400 – Any slot, except the bottom slot **0** which is reserved for SCB/RE. • SRX5600 – Any slot, except the bottom slots **0** or **1** which are reserved for SCB/RE. • SRX5800 – Any slot, except the middle slots **0**, **1**, and **2/6** which are reserved for SCB/RE and slots **0** (left most) and **11** (right most). **NOTE**: You can use the 2/6 slot to install an interface card if an SCB is not already installed in it.

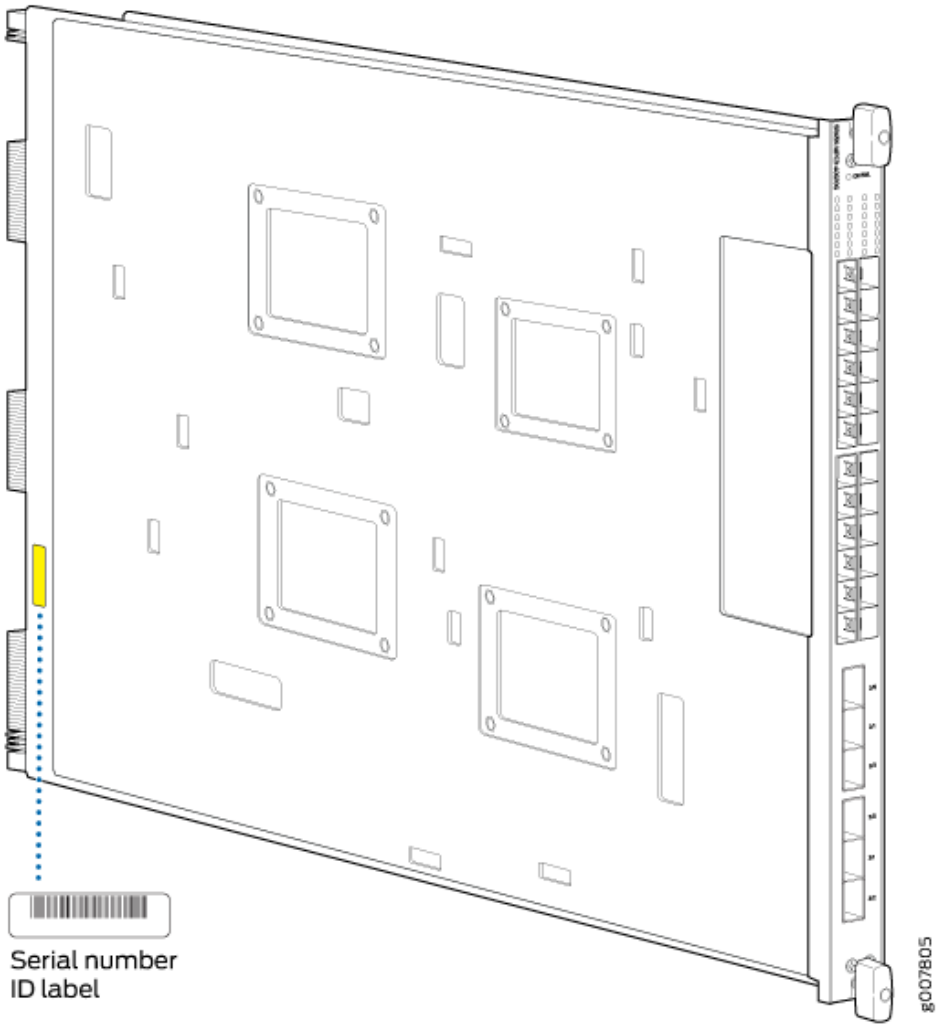
Cables and connectors	Sockets for 40-Gbps and 10-Gbps SFP+ transceivers See Hardware Compatibility Tool for the transceivers supported.
Power requirements	Typical: 9.68 A @ 48 V (460 W) At different temperatures: • 55° C: 607 W • 40° C: 541 W • 25° C: 511 W
Weight	21 lb (9.52 kg)

Hardware features	• Line-rate throughput of up to 240 Gbps
	• Supports up to 32,000 queues per-slot
	• LAN-PHY mode at 10.3125 Gbps on a per-port basis
	• The ports are labeled as:
	  • 10-Gigabit Ethernet ports: 0/0 through 0/11 and 1/0 through 1/11
	  • 40-Gigabit Ethernet ports: 2/0 through 2/2 and 3/0 through 3/2

Software features	• Optical diagnostics and related alarms • Two packet-forwarding engines, PFE0 and PFE1. PFE0 hosts PIC0 and PIC2. PFE1 hosts PIC1 and PIC3. • Configurable LAN-PHY mode options per 10-Gigabit Ethernet port • Intelligent oversubscription services **NOTE**: At any one time you can have only one of the following PIC combinations powered on: • PIC0 & PIC1 • PIC0 & PIC3 • PIC2 & PIC1 • PIC2 & PIC3 If you configure any of the following invalid PIC combinations, the chassis will set PIC0 & PIC1 combination online. • PIC0 & PIC2 • PIC1 & PIC3
LEDs	OK/FAIL LED, one bicolor: • Solid green—MPC is functioning normally. • Blinking green—MPC is transitioning online or offline. • Red—MPC has failed. 10-Gigabit Ethernet LINK LED, one green per port: • Green—Link is up. • Off—Link is down or disabled. 40-Gigabit Ethernet LINK LED, one bicolor per port: • Green—Link is up. • Amber—Link is disabled. • Off—Link is down.

Serial Number Location	The serial number label is located as shown in Figure 31 on page 62.

Figure 31: SRX5K-MPC3-40G10G Serial Number Label



SRX5K-MPC3-100G10G Specifications

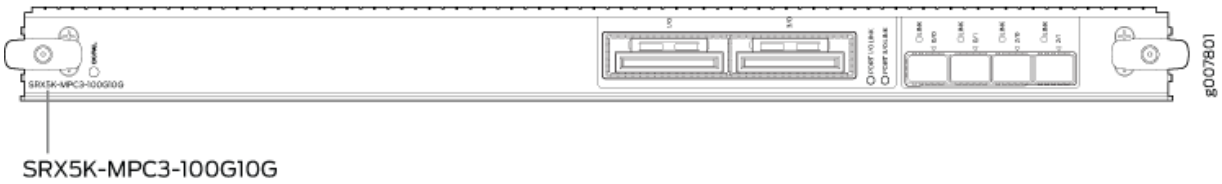
The SRX5K-MPC3-100G10G (IOC3) is an interface card that provides 100 Gigabit Ethernet and 10 Gigabit Ethernet interfaces, with a Packet Forwarding Engine that provides a 240 Gbps line rate. This interface card is supported on SRX5400, SRX5600, and SRX5800 Firewalls. See Figure 32 on page 63.

NOTE: These cards do not support plug-in Modular Interface Cards (MICs).

All ports on the interface card have dual-color LEDs for reporting link status.

The interface card also supports hot-pluggable optical modules.

Figure 32: SRX5K-MPC3-100G10G



If a slot in the SRX5400, SRX5600, or SRX5800 Firewall card cage is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

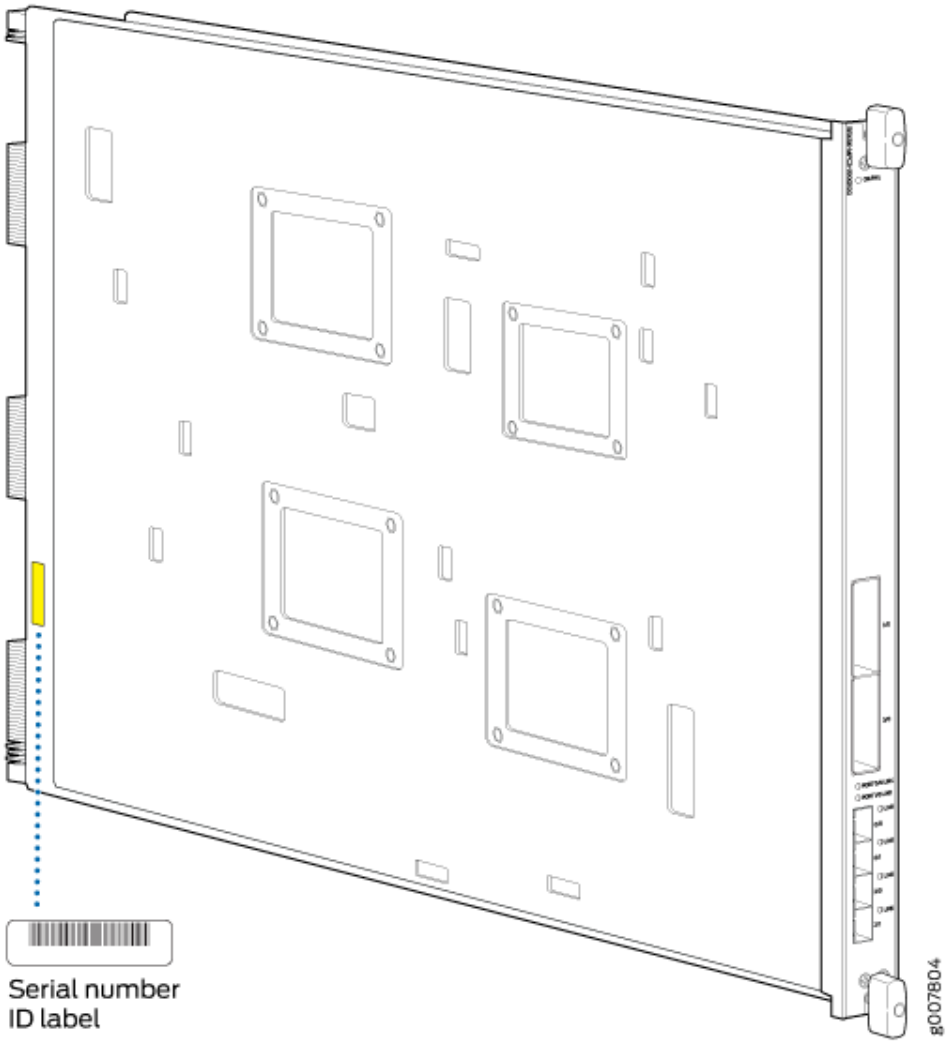
Description	• Fixed-configuration MPC with two 100-Gigabit Ethernet ports and four 10-Gigabit Ethernet ports • Maximum throughput: 240 Gbps • Maximum configurable MTU: 9192 bytes
Software release	Junos OS Release 15.1X49-D10 and later
Supported Slots	• SRX5400 – Any slot, except the bottom slot **0** which is reserved for SCB/RE. • SRX5600 – Any slot, except the bottom slots **0** or **1** which are reserved for SCB/RE. • SRX5800 – Any slot, except the middle slots **0**, **1**, and **2/6** which are reserved for SCB/RE and slots **0** (left most) and **11** (right most). **NOTE**: You can use the 2/6 slot to install an interface card if an SCB is not already installed in it.
Cables and connectors	Sockets for 100-Gbps and 10-Gbps SFP+ transceivers See Hardware Compatibility Tool for the transceivers supported.

Power requirements	• Typical: 10.52 A @ 48 V (505 W) At different temperatures: • 55° C: 607 W • 40° C: 541 W • 25° C: 511 W
Weight	21 lb (9.52 kg)
Hardware features	• Line-rate throughput of up to 240 Gbps • Supports up to 32,000 queues per-slot • LAN-PHY mode at 10.3125 Gbps on a per-port basis The ports are labeled as: • 10-Gigabit Ethernet ports: 0/0, 0/1, 2/0, and 2/1 • 100-Gigabit Ethernet ports: 1/0 and 3/0
Software features	• Configurable LAN-PHY mode options per 10-Gigabit Ethernet port • Optical diagnostics and related alarms • Intelligent oversubscription services

LEDs	OK/FAIL LED, one bicolor: • Solid green—MPC is functioning normally. • Blinking green—MPC is transitioning online or offline. • Red—MPC has failed. 10-Gigabit Ethernet LINK LED, one bicolor per port: • Green—Link is up. • Amber—Link is disabled. • Off—Link is down or disabled. 100-Gigabit Ethernet LINK LED, one bicolor per port: • Green—Link is up. • Amber—Link is disabled. • Off—Link is down.

Serial Number Location	The serial number label is located as shown in Figure 33 on page 66.

Figure 33: SRX5K-MPC3-100G10G Serial Number Label

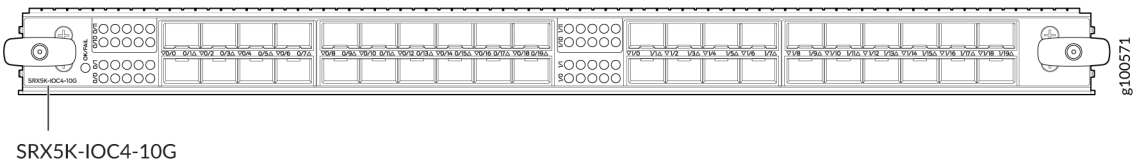


SRX5K-IOC4-10G Specifications

SRX5K-IOC4-10G is a fixed-configuration interface card with a Packet Forwarding Engine that provides 400-Gbps line rate. This interface card provides scalability in bandwidth and services to the SRX5400, SRX5600 and SRX5800 Firewalls. See Figure 34 on page 67.

NOTE: SRX5K-IOC4-10G cards do not support plug-in Modular Interface Cards (MICs).

Figure 34: SRX5K-IOC4-10G



If a slot in the SRX5400, SRX5600, or SRX5800 Firewall card cage is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

Description	• Fixed-configuration IOC with forty 10-Gbps port speeds • Maximum throughput: 400-Gbps • Maximum configurable MTU: 9192 bytes
Software release	Junos OS Release 19.3R1 and later
Supported slots	• SRX5400—Any slot, except the bottom slots **0** and **1/0**, which are reserved for SCB/RE. **NOTE**: Slot **1/0** is a dual purpose slot. You can install SRX5K-IOC4-10G in slot **1/0** if an SCB is not already installed in it. • SRX5600—Any slot, except the bottom slots **0** and **1**, which are reserved for SCB/RE. • SRX5800—Any slot, except the middle slots **0**, **1**, and **2/6**, which are reserved for SCB/RE, and slots **0** (most left) and **11** (most right). **NOTE**: Slot **2/6** is a dual purpose slot. You can install SRX5K-IOC4-10G in slot **2/6** if an SCB is not already installed in it.

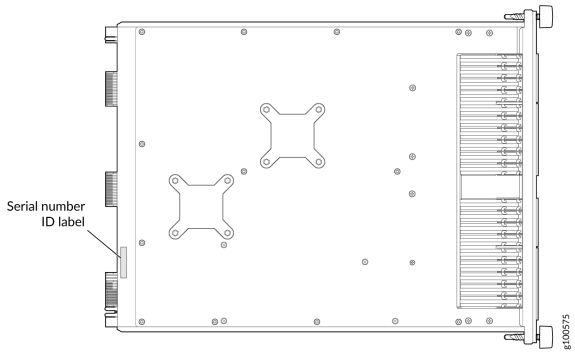
Cables and connectors	See Hardware Compatibility Tool for the transceivers supported.
Power requirements	• Typical: 405 W At different temperatures: • 131° F (55° C): 500 W • 104° F (40° C): 465 W • 75° F (25° C): 430 W
Weight	17 lb (7.7 kg)

Hardware features	• Junos Trio chipsets for increased scaling for bandwidth, subscribers, and services
	• Forty 10-Gigabit Ethernet ports. The ports support SFP+ transceivers.
	• Requires high-capacity power supplies and high-capacity fan trays.
	• The ports are labeled as (seeFigure 34 on page 67):
	  • **0/0** through **0/9**
	  • **0/10** through **0/19**
	  • **1/0** through **1/9**
	  • **1/10** through **1/19**

Software features	• Application security • Application Layer Gateway (ALG) • Attack detection and prevention • Class of service (CoS) • Equal-cost multipath (ECMP) load balancing • GPRS Tunneling Protocol (GTP) • High availability (chassis cluster) • Intrusion detection and prevention (IDP) • IPsec VPN • Layer 2 transparent mode • Logical systems • Network Address Translation (NAT) • Routing protocols (BFD, BGP, IGMP, IS-IS, MLD, Multicast, OSPF, PIM, RIP, and SCTP) • SSL proxy • Tenant systems • Content Security
LEDs	**OK/FAIL** LED, one bicolor: • Steady green—IOC is functioning normally. • Yellow—IOC has failed. **LINK** LED, one green per port: • Steady green—Link is up. • Off—Link is down or disabled.

Serial Number Location	The serial number label is located as shown in Figure 35 on page 70.

Figure 35: SRX5K-IOC4-10G Serial Number Label

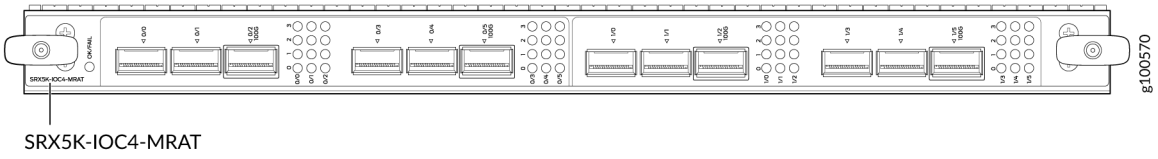


SRX5K-IOC4-MRAT Specifications

SRX5K-IOC4-MRAT is a fixed-configuration interface card with a Packet Forwarding Engine that provides up to 480-Gbps (240-Gbps per PIC slot) line rate. This interface card provides scalability in bandwidth and services to the SRX5400, SRX5600, and SRX5800 Firewalls. See Figure 36 on page 70.

NOTE: SRX5K-IOC4-MRAT cards do not support plug-in Modular Interface Cards (MICs).

Figure 36: SRX5K-IOC4-MRAT

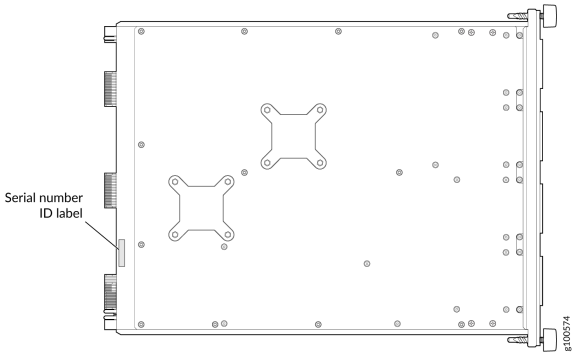


If a slot in the SRX5400, SRX5600, or SRX5800 Firewall card cage is not occupied by a card, you must install a blank panel to shield the empty slot and to allow cooling air to circulate properly through the firewall.

Description	• Fixed-configuration IOC with 10-Gbps, 40-Gbps, and 100-Gbps port speeds • Maximum throughput: up to 480 Gbps (240 Gbps per PIC slot) • Maximum configurable MTU: 9192 bytes
Software release	Junos OS Release 19.3R1 and later
Supported Slots	• SRX5400—Any slot, except the bottom slots **0** and **1/0**, which are reserved for SCB/RE. **NOTE**: Slot **1/0** is a dual purpose slot. You can install SRX5K-IOC4-MRAT in slot **1/0** if an SCB is not already installed in it. • SRX5600—Any slot, except the bottom slots **0** and **1**, which are reserved for SCB/RE. • SRX5800—Any slot, except the middle slots **0**, **1**, and **2/6**, which are reserved for SCB/RE, and slots **0** (most left) and **11** (most right). **NOTE**: Slot **2/6** is a dual purpose slot. You can install SRX5K-IOC4-MRAT in slot **2/6** if an SCB is not already installed in it.
Cables and connectors	See Hardware Compatibility Tool for the transceivers supported.
Power requirements	At different temperatures: • 131° F (55° C): 545 W • 104° F (40° C): 465 W • 75° F (25° C): 430 W
Weight	15.7 lb (7.12 kg)

Hardware features	• Junos Trio chipsets for increased scaling for bandwidth, subscribers, and services
	• Twelve Gigabit Ethernet ports that can be configured as 40-Gigabit Ethernet port or as 4X10-Gigabit Ethernet port using a breakout cable. The ports support quad small-form factor pluggable plus (QSFP+) transceivers.
	• Four out of the twelve ports can be configured as 100-Gigabit Ethernet ports. Port numbers **0/2**, **0/5**, **1/2** and **1/5** are the four 100-Gigabit Ethernet ports.
	• You can configure different combination of port speeds as long as the aggregate capacity per group of six ports labeled **0/0** through **0/5** does not exceed 240 Gbps. Similarly, aggregate capacity per group of the other six ports labeled **1/0** through **1/5** should not exceed 240 Gbps.
	• Requires high-capacity power supplies and high-capacity fan trays.
	• The ports are labeled as (see Figure 36 on page 70):
	  • 10-Gigabit Ethernet or 40-Gigabit Ethernet ports:
	  0/0, **0/1**, **0/2 100G**, **0/3**, **0/4**, **0/5 100G**, **1/0**, **1/1**, **1/2 100G**, **1/3**, **1/4**, and **1/5 100G**
	  • 100-Gigabit Ethernet ports:
	  0/2 100G, **0/5 100G**, **1/2 100G** and **1/5 100G**
	NOTE: Only ports marked **100G** support 100-Gigabit Ethernet speed using QSFP28 transceivers.

Software features	• Application security • Application Layer Gateway (ALG) • Attack detection and prevention • Class of service (CoS) • Equal-cost multipath (ECMP) load balancing • GPRS Tunneling Protocol (GTP) • High availability (chassis cluster) • Intrusion detection and prevention (IDP) • IPsec VPN • Layer 2 transparent mode • Logical systems • Network Address Translation (NAT) • Routing protocols (BFD, BGP, IGMP, IS-IS, MLD, Multicast, OSPF, PIM, RIP, and SCTP) • SSL proxy • Tenant systems • Content Security
LEDs	**OK/FAIL** LED, one bicolor: • Steady green—IOC is functioning normally. • Yellow—IOC has failed. **LINK** LED, one green per port (4 per QSFP+ cage): • Steady green—Link is up. • Off—Link is down or disabled.

Serial Number Location	The serial number label is located as shown in Figure 37 on page 74. **Figure 37: SRX5K-IOC4-MRAT Serial Number Label** 

CHAPTER 6

Switch Control Boards

IN THIS CHAPTER

Switch Control Boards Specifications

IN THIS SECTION

Switch Control Board SRX5K-SCB Specifications

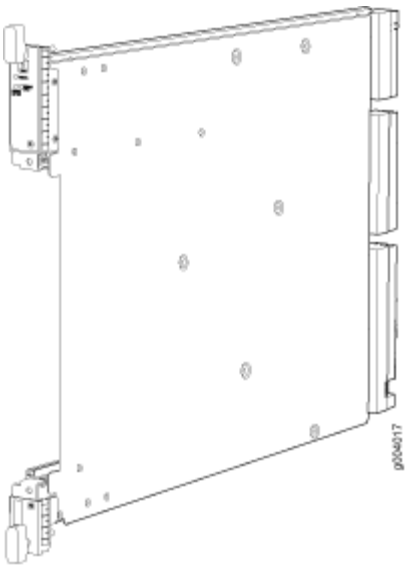
The SRX5K-SCB Switch Control Board (SCB) (Figure 38 on page 76) performs the following functions:

- Powers on and powers off I/O cards (IOCs) and Services Processing Cards (SPCs)
- Controls clocking, system resets, and booting
- Monitors and controls system functions, including fan speed, board power status, PDM status and control, and the system front panel
- Provides interconnections to all the IOCs within the chassis through the switch fabrics integrated into the SCB

SRX5400 and SRX5600 Firewalls have one SCB each installed and you can install a second SCB for redundancy. The SRX5800 Firewall has two SCBs installed and you can install a third SCB for switch fabric redundancy.

The host subsystem is composed of a Routing Engine installed directly into a slot on the faceplate of the SCB. When there is no Routing Engine is a SCB, its slot must be covered with a blank panel.

Figure 38: Switch Control Board SRX5K-SCB



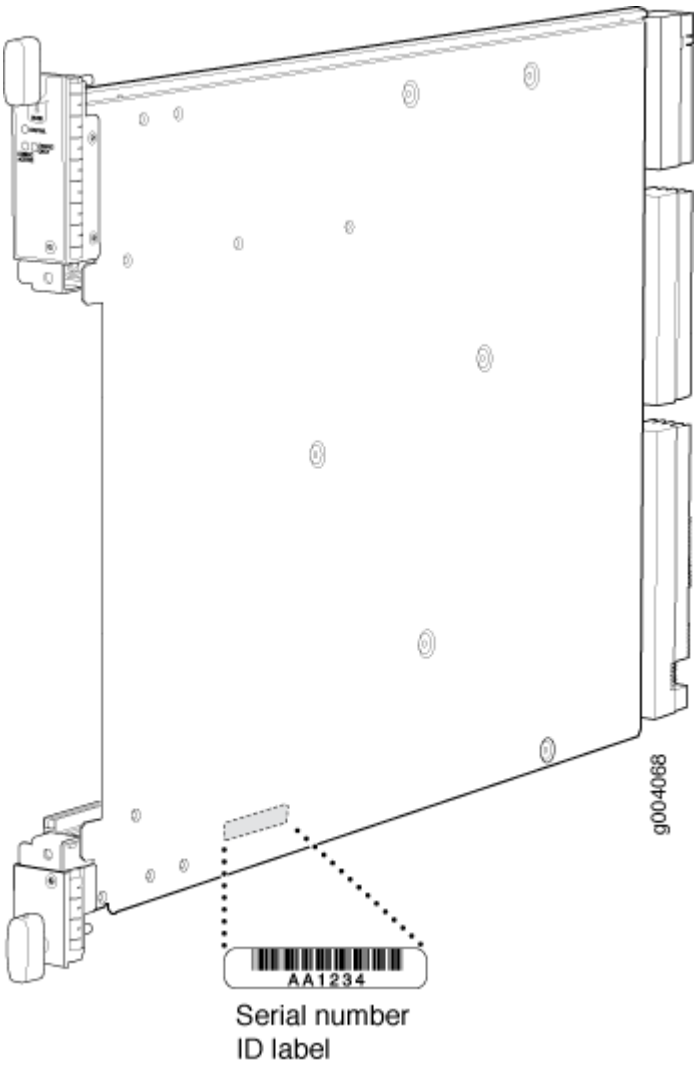
Each SCB consists of the following components:

- Chassis management Ethernet switch.
- I2C bus logic, used for low-level communication with each component.
- Component redundancy circuitry.
- Gigabit Ethernet switch that is connected to the embedded CPU complex on all components.
- Switch fabric—Provides the switching functions for the IOCs.
- Control FPGA—Provides the Peripheral Component Interconnect (PCI) interface to the Routing Engine.
- 1000Base-T Ethernet controller—Provides a 1-Gbps Ethernet link between the Routing Engines.
- Ethernet switch—Provides 1-Gbps link speeds between the Routing Engine and the IOCs.
- Circuits for chassis management and control.
- Power circuits for the Routing Engine and SCB.

Description	• SCB with slot for Routing Engine • Maximum throughput: 75 Gbps per slot
Software release	• Junos OS Release 9.2 and later
Cables and connectors	Slot for Routing Engine
Controls	None
Supported Slots	• SRX5400–Only bottom slots **0** and **1/0** • SRX5600–Only bottom slots **0** and **1** • SRX5800–Only center slots **0**, **1**, and **2/6**
Power Requirement	150 W
Weight	Approximately 10 lb (4.5 kg)
LEDs	**OK/FAIL** LED, one bicolor: • Green–The SCB is operating normally. • Red–The SCB has failed and is not operating normally. • Off–The SCB is powered down. **FABRIC ONLY** LED: • Green–The SCB is operating in fabric-only mode. • Off–The SCB is operating in fabric/control board mode. **FABRIC ACTIVE** LED: • Green–The fabric is in active mode.

Serial Number Location The serial number label is located as shown in Figure 39 on page 78.

Figure 39: SCB Serial Number Label



Switch Control Board SRX5K-SCBE Specifications

IN THIS SECTION

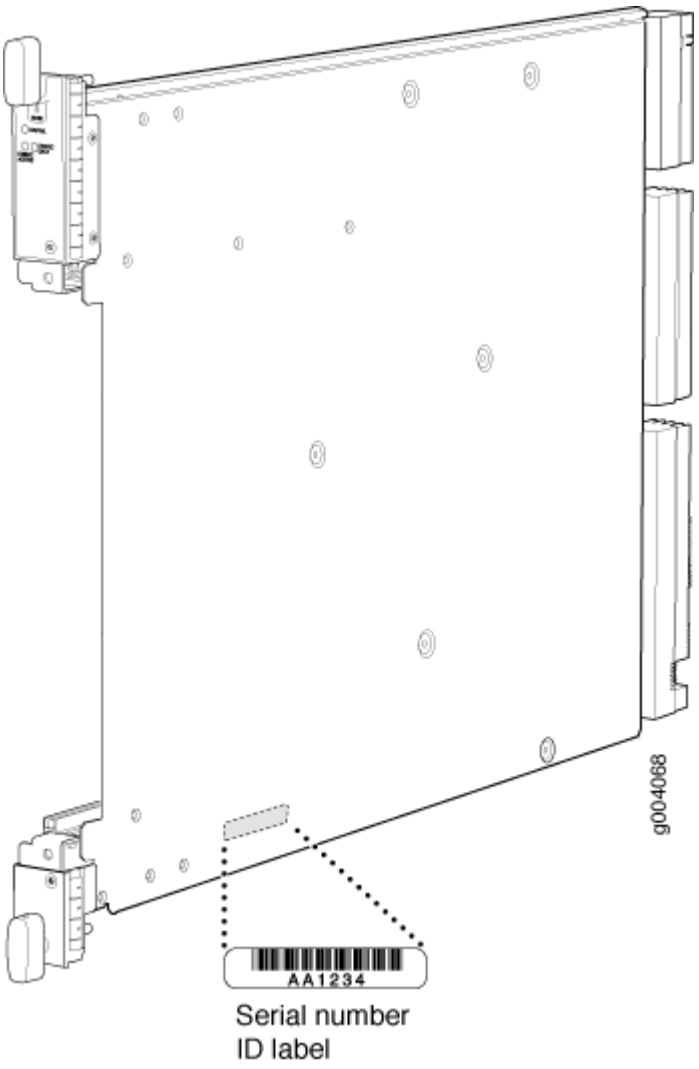
Each SRX5K-SCBE consists of the following components:

- I2C bus logic for low-level communication with each component
- Component redundancy circuitry
- Control Board/Routing Engine primary-role mechanism
- Gigabit Ethernet switch that is connected to the embedded CPU complex on all components
- Switch fabric to provide the switching functions for the MPCs
- 1000BASE-T Ethernet controller to provide a 1-Gbps Ethernet link between the Routing Engines
- Power circuits for the Routing Engine and the SRX5K-SCBE
- LEDs—Provides status of the SRX5K-SCBE and clocking interface

Description	• SRX5K-SCBE with slot for Routing Engine • Maximum throughput: 120 Gbps per slot
Software release	Junos OS Release 12.1X47-D15 and later
Cables and connectors	Slot for Routing Engine
Controls	None
Supported slots	• SRX5400–Only bottom slots **0** and **1/0** • SRX5600–Only bottom slots **0** and **1** • SRX5800–Only center slots **0**, **1**, and **2/6**
Power requirement	• 160 W at 131° F (55° C) • 130 W at 104° F (40° C) • 120 W at 77° F (25° C)
Weight	9.6 lb (4.4 kg) with Routing Engine

Serial number location	The serial number label is located as shown in Figure 40 on page 80.

Figure 40: SRX5K-SCBE Serial Number Label



SRX5K-SCBE LEDs

Table 2 on page 81 describes the SRX5K-SCBE LEDs and their states.

Table 2: SRX5K-SCBE LEDs

Label	Color	State	Description
FABRIC ACTIVE	Green	On steadily	Fabric is in active mode.
FABRIC ONLY	Green	On steadily	SRX5K-SCBE operates in fabric-only mode.
	None	Off	SRX5K-SCBE operates in fabric/control board mode.
OK/FAIL	Green	On steadily	SRX5K-SCBE is online.
	Red	On steadily	SRX5K-SCBE has failed.
	None	Off	SRX5K-SCBE is offline.

Switch Control Board SRX5K-SCB3 Specifications

IN THIS SECTION

Each SRX5K-SCB3 (SCB3) consists of the following components:

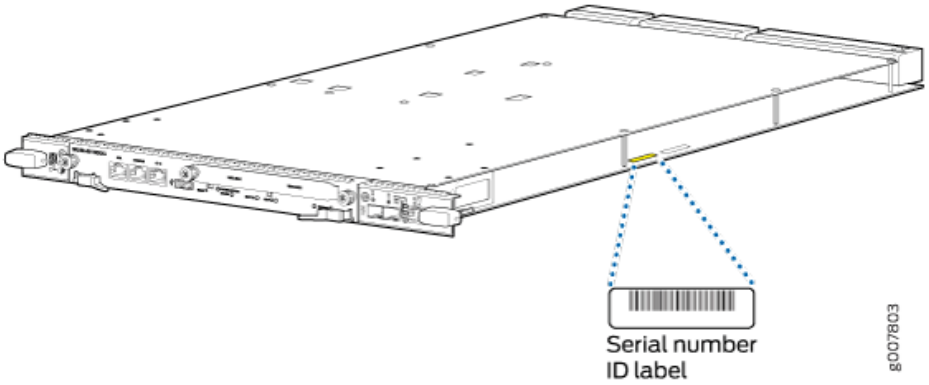
- I2C bus logic for low-level communication with each component
- Component redundancy circuitry
- Control Board/Routing Engine primary-role mechanism
- Gigabit Ethernet switch that is connected to the embedded CPU complex on all components
- Switch fabric to provide the switching functions for the MPCs

- Control field-programmable gate array (FPGA) to provide the Peripheral Component Interconnect (PCI) interface to the Routing Engine
- Circuits for chassis management and control
- Power circuits for the Routing Engine and SCB3
- LEDs to provides status of the SCB3

Description	SCB3 with slot for Routing Engine
Software release	Junos OS Release 15.1X49-D10 and later
Cables and connectors	Slot for Routing Engine
Controls	None
Supported slots	• SRX5400–Only bottom slots **0** and **1/0** • SRX5600–Only bottom slots **0** and **1** • SRX5800–Only center slots **0**, **1**, and **2/6**
Power requirement	300 W
Weight	9.6 lb (4.4 kg) with Routing Engine

Serial number location	The serial number label is located as shown in Figure 41 on page 83.

Figure 41: SRX5K-SCB3 Serial Number Label



SRX5K-SCB3 LEDs

Table 3 on page 83 describes the SCB3 LEDs and their states.

Table 3: SRX5K-SCB3 LEDs

Label	Color	State	Description
FABRIC ACTIVE	Green	On steadily	Fabric is in active mode.
OK/FAIL	Green	On steadily	SCB3 is online.
	Red	On steadily	SCB3 has failed.
	–	Off	SCB3 is offline.
LINK	Green	On steadily	Port is enabled and link is established.
	–	Off	Port is disabled or no link is established.

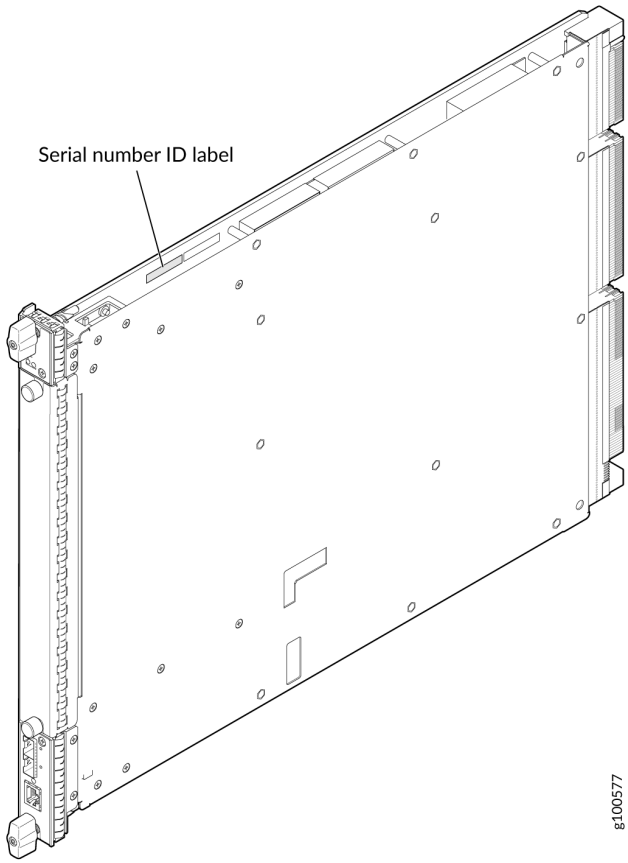
Switch Control Board SRX5K-SCB4 Specifications

IN THIS SECTION

SRX5K-SCB4 (SCB4) consists of the following components:

- LEDs to provides status of the SCB4.
- Circuits for chassis management and control.
- Power circuits for the Routing Engine and SCB4.

Description	SCB4 with slot for SRX5K-RE-1800X4 and SRX5K-RE3-128G Routing Engines
Software release	Junos OS Release 19.3R1 and later
Cables and connectors	Slot for Routing Engine
Controls	None
Supported slots	• SRX5400–Not supported • SRX5600–Only bottom slots **0** and **1** • SRX5800–Only center slots **0**, **1**, and **2/6**
Power requirement	At different temperatures: • 55° C: 425 W • 40° C: 400 W • 25° C: 385 W
Cooling requirement	For efficient and reliable power and cooling, you must install SRX Series high-capacity power supplies and fan trays in the SRX Series chassis.

Weight and Dimensions	• Weight: 13.6 lb (6.2 kg) • Width: 15.7 in (39.87 cm) • Depth: 21.2 in (53.85 cm) • Height: 1.2 in (3.05 cm)
Serial number location	The serial number label is located as shown in Figure 42 on page 85. **Figure 42: SRX5K-SCB4 Serial Number Label** 

SRX5K-SCB4 LEDs

Table 4 on page 86 describes the SCB4 LEDs and their states.

Table 4: SRX5K-SCB4 LEDs

Label	Color	State	Description
OK/FAIL	Green	On steadily	SCB4 is online.
	Red	On steadily	SCB4 has failed.
	–	Off	SCB4 is offline.
FABRIC			
ACTIVE	Green	On steadily	The switch fabric on this board is in Active mode.
ONLY	Green	On steadily	The switch is in Fabric-Only mode.
LINK (XGE port)	Green	On steadily	SFP+ port is enabled and link is established.
	–	Off	SFP+ port is disabled or no link is established.
GPS	Green	On steadily	Indicates the status of the GPS clocking interface, and the link is OK.
	Yellow	Blinking	Activity on the clocking interface.

CHAPTER 7

Routing Engines

IN THIS CHAPTER

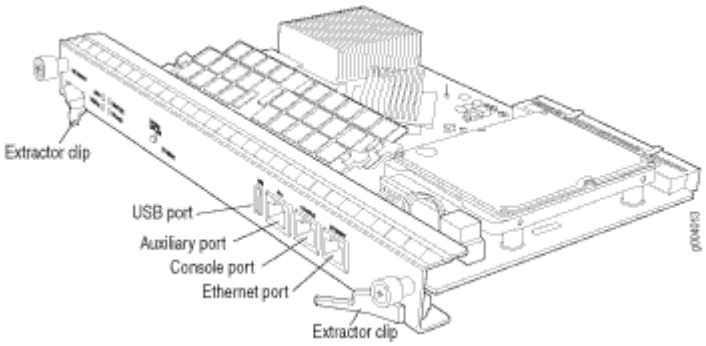
Routing Engine Specifications

IN THIS SECTION

Routing Engine SRX5K-RE-13-20 Specifications

The SRX5K-RE-13-20 Routing Engine (Figure 43 on page 88) is an Intel-based PC platform that runs the Junos operating system (Junos OS). Software processes that run on the Routing Engine maintain the routing tables, manage the routing protocols used on the device, control the device interfaces, control some chassis components, and provide the interface for system management and user access to the device.

Figure 43: Routing Engine



You must install at least one Routing Engine in the firewall. You can install a second Routing Engine if both Routing Engines are running Junos OS Release 10.0 or later. A second Routing Engine is required if you are using the dual chassis cluster control link feature available in Junos OS Release 10.0 and later. The second Routing Engine does not perform all the functions of a Routing Engine and does not improve resiliency or redundancy. The second Routing Engine and the Switch Control Board (SCB) in which it is installed do not constitute a host subsystem. The only function of the second Routing Engine is to enable the hardware infrastructure that enables the chassis cluster control 1 port on the Services Processing Card (SPC) used for chassis cluster control links. If you install only one Routing Engine in the firewall, you must install it in the slot in the front panel of SCB0. If you install a second Routing Engine to use the dual chassis cluster control link feature, you install it in the slot in the front panel of SCB1.

The Routing Engine consists of the following components:

- CPU—Runs Junos OS to maintain the firewall's routing tables and routing protocols. It has a Pentium-class processor.
- DRAM—Provides storage for the routing and forwarding tables and for other Routing Engine processes.
- USB port—Provides a removable media interface through which you can install Junos OS manually. Junos supports USB version 1.0.
- Internal flash disk—Provides primary storage for software images, configuration files, and microcode. The disk is a fixed compact flash and is inaccessible from outside the firewall.
- Hard disk—Provides secondary storage for log files, memory dumps, and rebooting the system if the internal compact flash disk fails.
- HDD LED—Indicates disk activity for the hard disk drive.
- Management ports—Each Routing Engine has one 10/100-Mbps Ethernet port for connecting to a management network, and two asynchronous serial ports—one for connecting to a console and one for connecting to a modem or other auxiliary device. The interface ports are labeled **AUX**, **CONSOLE**, and **ETHERNET**.

- EEPROM—Stores the serial number of the Routing Engine.
- Extractor clips—Used for inserting and extracting the Routing Engine.
- Captive screws—Secures the Routing Engine in place.

The Routing Engine boots from the storage media in this order: the USB device (if present), then the internal flash disk, then the hard disk, then the LAN.

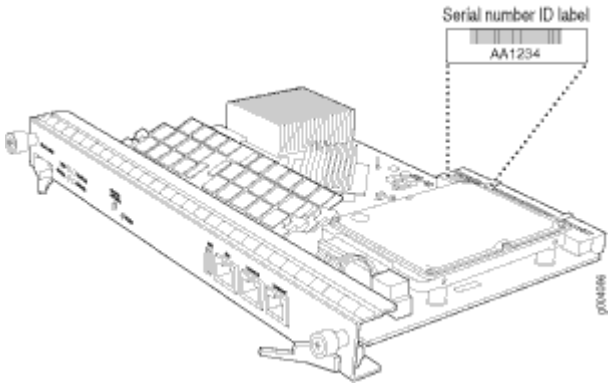
NOTE: For specific information about Routing Engine components (for example, the amount of DRAM), issue the `show chassis routing-engine` command.

Description	Routing Engine for SRX5400, SRX5600, and SRX5800 Firewalls
Software release	• Junos OS Release 9.2 and later • Junos OS Release 10.0 and later required to install a second Routing Engine
Cables and connectors	**AUX**—Connects the Routing Engine to a laptop, a modem, or another auxiliary device through a cable with an RJ-45 connector. **CONSOLE**—Connects the Routing Engine to a system console through a cable with an RJ-45 connector. **ETHERNET**—Connects the Routing Engine through an Ethernet connection to a management LAN (or any other device that plugs into an Ethernet connection) for out-of-band management.
Controls	• **RESET** button—Reboots the Routing Engine when pressed • **ONLINE/OFFLINE** Button—Not supported in the current release

Supported Slots	Front panel slot in an SCB installed in: • SRX5400: Bottom slot 0 • SRX5600: Bottom slots 0 or 1 • SRX5800: Center slots 0 or 1 **NOTE**: The firewall host subsystem Routing Engine must be installed in the SCB in slot **0**. A Routing Engine installed in an SCB in slot **1** only enables dual control links in chassis cluster configurations.
Power Requirement	90 W
Weight	Approximately 2.4 lb (1.1 kg)
LEDs	**HDD** LED: • Blinking green–The Routing Engine hard disk is functioning normally. **MASTER** LED: • Blue–The Routing Engine is Primary. **NOTE**: The SRX5400, SRX5600, and SRX5800 Firewalls do not support a secondary or backup Routing Engine, so the **MASTER** LED should always be lit. **OK/FAIL** LED, one bicolor: • Off–The Routing Engine is operating normally. • Red–The Routing Engine has failed and is not operating normally. **ONLINE** LED: • Blinking green–The Routing Engine is coming online. • Steady green–The Routing Engine is functioning normally.

Serial Number Location	The serial number label is located on the right side of the top of the Routing Engine as shown in Figure 44 on page 91

Figure 44: SRX5K-RE-13-20 Serial Number Label



Routing Engine SRX5K-RE-1800X4 Specifications

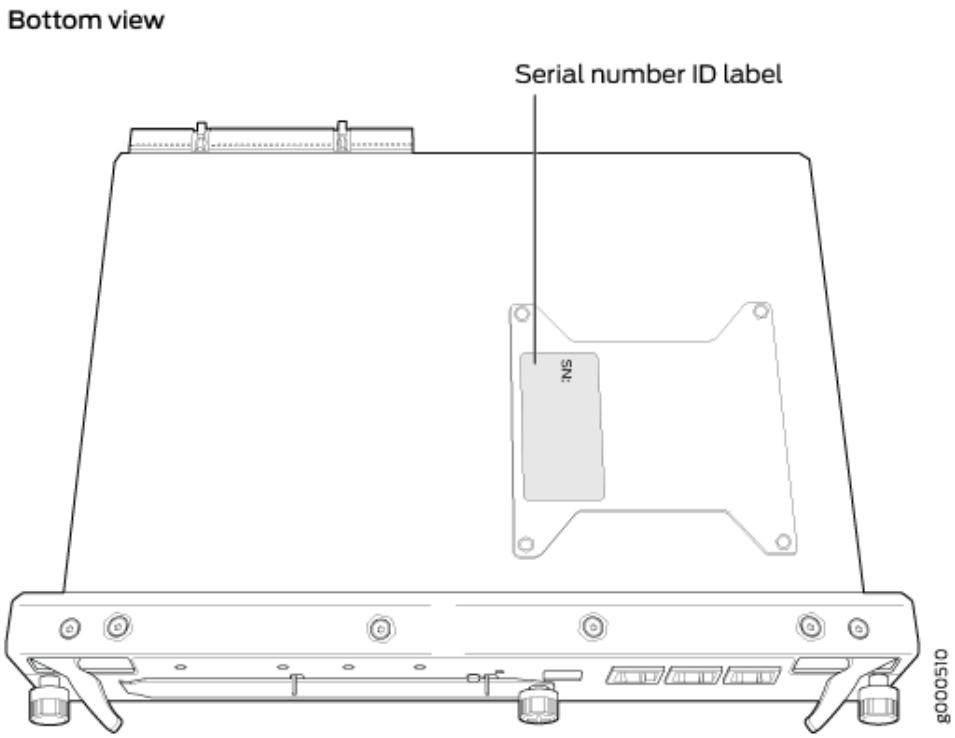
IN THIS SECTION

Each Routing Engine consists of the following components:

- CPU—Runs Junos OS to maintain the routing tables and routing protocols.
- DRAM—Provides storage for the routing and forwarding tables and for other Routing Engine processes.
- USB port—Provides a removable media interface through which you can install the Junos OS manually. Junos OS supports USB version 1.0 and 2.0.
- CompactFlash card—Provides primary storage for software images, configuration files, and microcode. The CompactFlash card is fixed and is inaccessible from outside the device.
- Solid-state drive (SSD)—Provides secondary storage for log files, for generating core files, and for rebooting the system if the CompactFlash card fails.

- Interface ports—The **AUX**, **CONSOLE**, and **ETHERNET** ports provide access to management devices. Each Routing Engine has one 10/100/1000-Mbps Ethernet port for connecting to a management network, and two asynchronous serial ports—one for connecting to a console and one for connecting to a modem or other auxiliary device.
- EEPROM—Stores the serial number of the Routing Engine.
- Reset button—Reboots the Routing Engine when pressed.
- Online/Offline button—Takes the Routing Engine online or offline when pressed.
- Extractor clips—Inserts and extracts the Routing Engine.
- Captive screws—Secures the Routing Engine in place.

Description	Routing Engine for SRX5400, SRX5600, and SRX5800 Firewalls
Software release	Junos OS Release 12.1X47-D15 and later
Cables and connectors	Slot for Routing Engine • **AUX**–Connects the Routing Engine to a laptop, a modem, or another auxiliary device through a cable with an RJ-45 connector. • **CONSOLE**–Connects the Routing Engine to a system console through a cable with an RJ-45 connector. • **ETHERNET**–Connects the Routing Engine through an Ethernet connection to a management LAN (or any other device that plugs into an Ethernet connection) for out-of-band management.
Controls	RESET button–Reboots the Routing Engine when pressed.
Supported slots	Front panel slot in an SCB installed in: • SRX5400: Bottom slot 0 • SRX5600: Bottom slots 0 or 1 • SRX5800: Center slots 0 or 1 **NOTE**: The firewall host subsystem Routing Engine must be installed in the SCB in slot 0. A Routing Engine installed in an SCB in slot 1 only enables dual control links in chassis cluster configurations.

Power requirement	90 W
Weight	2.4 lb (1.1 kg)
Serial number location	The serial number label is located as shown in Figure 45 on page 93. **Figure 45: SRX5K-RE-1800X4 Serial Number Label** 

SRX5K-RE-1800X4 LEDs

Each Routing Engine has four LEDs that indicate its status. The LEDs, labeled **MASTER**, **STORAGE**, **ONLINE**, and **OK/FAIL**, are located directly on the faceplate of the Routing Engine. Table 5 on page 94 describes the Routing Engine LEDs and their states.

Table 5: SRX5K-RE-1800X4 LEDs

Label	Color	State	Description
MASTER	Blue	On steadily	Routing Engine is the primary.
STORAGE	Green	Blinking	Indicates activity on the SSD or CompactFlash card.
ONLINE	Green	Blinking	Routing Engine is transitioning online.
	None	On steadily	Routing Engine is functioning normally.
OK/FAIL	Red	On steadily	Routing Engine has failed.

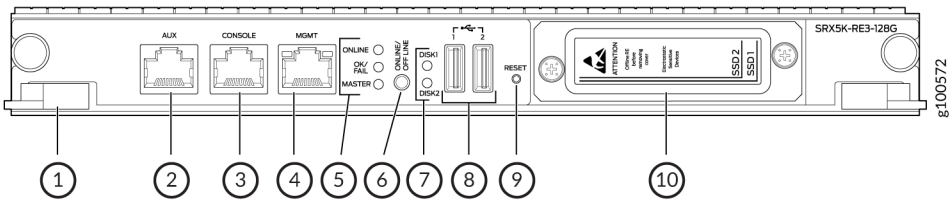
Routing Engine SRX5K-RE3-128G Specifications

IN THIS SECTION

The Routing Engine maintains the routing tables, manages the routing protocols used on the device, controls the device interfaces, controls some chassis components, and provides the interfaces for system management and user access to the device.

Figure 46 on page 95 shows the SRX5K-RE3-128G Routing Engine.

Figure 46: SRX5K-RE3-128G Routing Engine Front View



1– Extractor clips	6– **ONLINE/OFFLINE** button
2– Auxiliary port (**AUX**)	7– SSD LEDs—**DISK1** and **DISK2**
3– Console port (**CONSOLE**)	8– USB ports—**USB1** and **USB2**
4– Management port (**MGMT**)	9– **RESET** button
5– Routing Engine status LEDs—**ONLINE**, **OK/FAIL**, and **MASTER**	10– SSD card slot cover

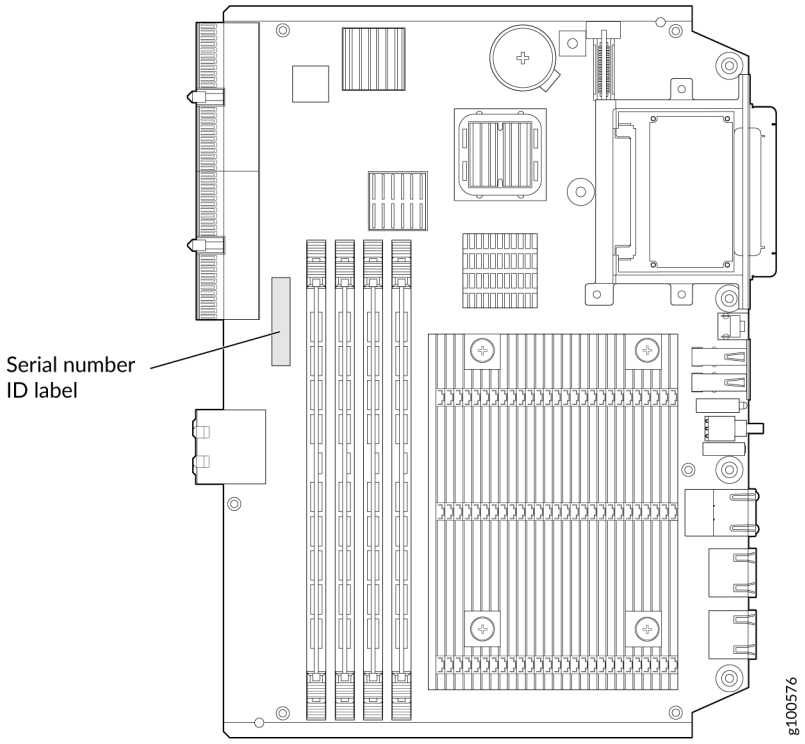
Description	Routing Engine for SRX5400, SRX5600, and SRX5800 Firewalls, based on Intel's Haswell-EP CPU with 6 cores, and 128GB of DDR4 memory. It provides increased control plane performance and scalability along with virtualization features in the SRX Series 5000 line of chassis.
Software release	Junos OS Release 19.3R1 and later
Cables and connectors	Slot for Routing Engine • **AUX**–Connects the Routing Engine to a laptop, a modem, or another auxiliary device through a cable with an RJ-45 connector. • **CONSOLE**–Connects the Routing Engine to a system console through a cable with an RJ-45 connector. • **MGMT**–Connects the Routing Engine through an Ethernet connection to a management LAN (or any other device that plugs into an Ethernet connection) for out-of-band management.
Controls	**RESET** button–Reboots the Routing Engine when pressed.

Supported slots	Front panel slot in an SCB installed in: • SRX5400: Bottom slot 0 • SRX5600: Bottom slots 0 or 1 • SRX5800: Center slots 0 or 1 **NOTE**: The firewall host subsystem Routing Engine must be installed in the SCB in slot 0. A Routing Engine installed in an SCB in slot 1 only enables dual control links in chassis cluster configurations. **NOTE**: In the SRX5600 or SRX5800 Firewalls chassis cluster configurations, dual control links functionality is not supported if you mix SRX5K-RE-1800X4 and SRX5K-RE3-128G Routing Engines. To support dual control links you have to install two SRX5K-RE3-128Gs.
Power requirement	110 W
Weight	2.69 lb (1.22 kg)

Serial number location

The serial number label is located as shown in Figure 47 on page 97.

Figure 47: SRX5K-RE3-128G Serial Number Label



SRX5K-RE3-128G Routing Engine Components

Each Routing Engine consists of the following components:

- CPU—Runs Junos OS to maintain the routing tables and routing protocols.
- EEPROM—Stores the serial number of the Routing Engine.
- DRAM—Provides storage for the routing and forwarding tables and for other Routing Engine processes.
- One 10-Gigabit Ethernet interface between the Routing Engine and Switch Control Board.
- Extractor clips—Control the locking system that secures the Routing Engine.
- Interface ports—The **AUX**, **CONSOLE**, and **MGMT** ports provide access to management devices. Each Routing Engine has one 10/100/1000-Mbps Ethernet port for connecting to a management

network, and two asynchronous serial ports—one for connecting to a console and one for connecting to a modem or other auxiliary device.

> **NOTE**: The control interface names differ based on the routing engine:
>
> - For RE2, the control interfaces are displayed as `em0` and `em1`.
> - For RE3, the control interfaces are displayed as `ixlv0` and `igb0`.
>
> For more information, see show chassis cluster interfaces.

- Status LEDs—Table 6 on page 98 describes the functions of the **ONLINE**, **OK/FAIL**, **MASTER**, **DISK1**, and **DISK2** LEDs.
- **ONLINE/OFFLINE** button—Takes the Routing Engine online or offline when pressed.

  > **NOTE**: The **ONLINE/OFFLINE** button must be pressed for a minimum of 4 seconds.

- **USB1** and **USB2** ports—Provide a removable media interface through which you can install Junos OS manually. Junos OS supports USB versions 3.0, 2.0, and 1.1.
- **RESET** button—Reboots the Routing Engine when pressed.
- **SSD1** (primary) and **SSD2** (secondary) Solid-state drives (SSD)—Two 200-GB each slim solid-state drives that provide storage for software images, configuration files, microcode, log files, and memory dumps. The Routing Engine reboots from **SSD2** when boot from primary **SSD1** fails.
- Captive screws—Secures the Routing Engine.

SRX5K-RE3-128G Routing Engine LEDs

Each Routing Engine has four LEDs that indicate its status. The LEDs, labeled **ONLINE**, **OK/FAIL**, **MASTER**, **DISK1**, and **DISK2**, are located directly on the faceplate of the Routing Engine. Table 6 on page 98 describes the Routing Engine LEDs and their states.

Table 6: SRX5K-RE3-128G Routing Engine LEDs

Label	Color	State	Description
ONLINE	Green	Blinking slowly	Routing Engine is in the process of booting BIOS and the host OS.

Table 6: SRX5K-RE3-128G Routing Engine LEDs *(Continued)*

Label	Color	State	Description
		Blinking rapidly	Routing Engine is in the process of booting Junos OS.
	-	Off	Routing Engine is not online or not functioning normally.
OK/FAIL	Green	On steadily	Routing Engine is powering up.
	Yellow	On steadily	Routing Engine is not powering up, which indicates failure.
MASTER	Blue	On steadily	This Routing Engine is the primary Routing Engine.
DISK1	Green	Blinking	Indicates presence of disk activity.
	-	Off	There is no disk activity.
DISK2	Green	Blinking	Indicates presence of disk activity.
	-	Off	There is no disk activity.

SRX5K-RE3-128G Routing Engine Boot Sequence

Booting in a SRX5K-RE3-128G Routing Engine follows this sequence—the USB device, SSD1, SSD2, and LAN. SSD1 is the primary boot device. The boot sequence is tried twice for SSD1 and SSD2.

2

PART

Handling and Storing Cards

CHAPTER 8

Handling and Storing SRX5400, SRX5600, and SRX5800 Firewall Cards

IN THIS CHAPTER

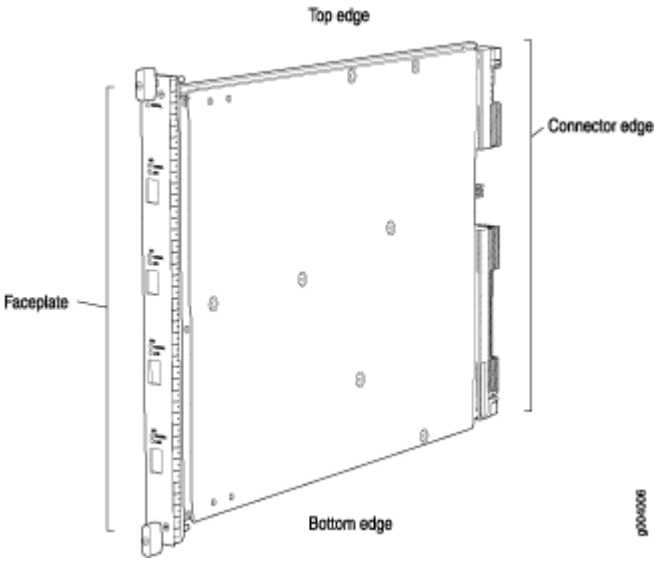
SRX5400, SRX5600, and SRX5800 Firewall Card Terminology

Regardless of orientation, this information uses the same terms for all four edges of the card (see Figure 48 on page 102):

- Faceplate—Edge of the card that has connectors to which you connect cables or sockets in which you insert SFP or XFP transceivers.
- Connector edge—Edge opposite the faceplate; this edge has the connectors that attach to the midplane.
- Top edge—Edge at the top of the card when it is vertical.
- Bottom edge—Edge at the bottom of the card when it is vertical.

NOTE: This terminology applies to SPCs, IOCs, MPCs, and SCBs in addition to Routing Engines and port modules.

Figure 48: Card Edges



RELATED DOCUMENTATION

Cards Supported on SRX5400, SRX5600, and SRX5800 Firewalls

Handling an SRX5400, SRX5600, or SRX5800 Firewall Card

When carrying a card, you can hold it either vertically or horizontally.

NOTE: A card weighs up to 18.3 lb (8.3 kg). Be prepared to accept the full weight of the card as you lift it.

To hold a card vertically:

1. Orient the card so that the faceplate faces you. To verify orientation, confirm that the text on the card is right-side up and the EMI strip is on the right-hand side.
2. Place one hand around the card faceplate about a quarter of the way down from the top edge. To avoid deforming the EMI shielding strip, do not press hard on it.
3. Place your other hand at the bottom edge of the card.

If the card is horizontal before you grasp it, place your left hand around the faceplate and your right hand along the bottom edge.

To hold a card horizontally:

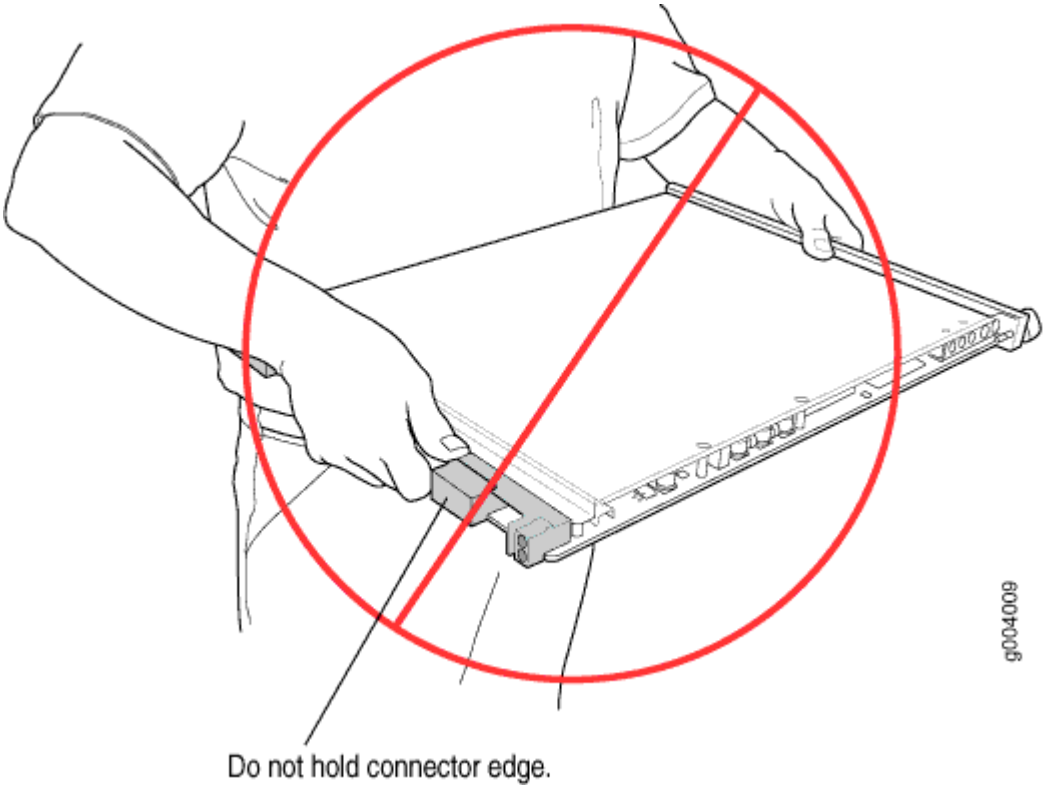
1. Orient the card so that the faceplate faces you.
2. Grasp the top edge with your left hand and the bottom edge with your right hand.

You can rest the faceplate of the card against your body as you carry it.

As you carry the card, do not bump it against anything. Card components are fragile.

Never hold or grasp the card anywhere except those places that this topic indicates are appropriate. In particular, never grasp the connector edge, especially at the power connector in the corner where the connector and bottom edges meet (see Figure 49 on page 103).

Figure 49: Do Not Grasp the Connector Edge

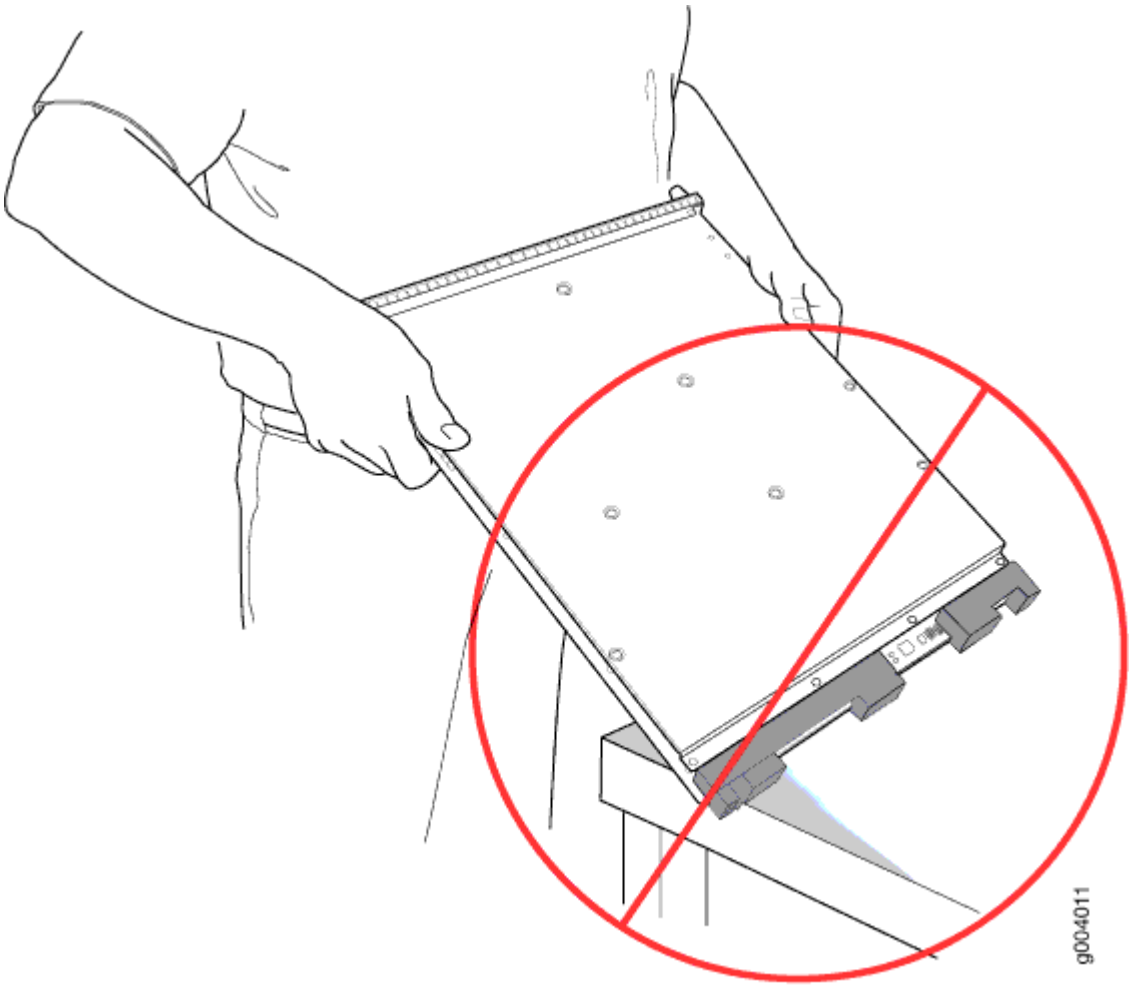


Never carry the card by the faceplate with only one hand.

Do not rest any edge of a card directly against a hard surface (see Figure 50 on page 104).

Do not stack cards.

Figure 50: Do Not Rest the Card on an Edge



If you must rest the card temporarily on an edge while changing its orientation between vertical and horizontal, use your hand as a cushion between the edge and the surface.

RELATED DOCUMENTATION

Cards Supported on SRX5400, SRX5600, and SRX5800 Firewalls

Storing an SRX5600, SRX5600, or SRX5800 Firewall Card

You must store a card as follows:

- In the firewall chassis
- In the container in which a spare card is shipped
- Horizontally and sheet metal side down

When you store a card on a horizontal surface or in the shipping container, always place it inside an antistatic bag. Because the card is heavy, and because antistatic bags are fragile, inserting the card into the bag is easier with two people. To do this, one person holds the card in the horizontal position with the faceplate facing the body, and the other person slides the opening of the bag over the card connector edge.

If you must insert the card into a bag by yourself, first lay the card horizontally on a flat, stable surface, sheet metal side down. Orient the card with the faceplate facing you. Carefully insert the card connector edge into the opening of the bag, and pull the bag toward you to cover the card.

Never stack a card under or on top of any other component.

RELATED DOCUMENTATION

> *Cards Supported on SRX5400, SRX5600, and SRX5800 Firewalls*