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Juniper Licensing

Administration Guide

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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

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About This Guide

This guide describes how to activate, install, manage, and monitor licenses on Juniper Networks products. Note that this guide includes instructions for two different licensing portals:

1. Juniper Agile Licensing (JAL) portal—Available at: https://license.juniper.net/licensemanage/. Juniper Networks introduced the Juniper Agile Licensing Portal to install and manage licenses for hardware and software features. Juniper Agile Licensing is the new and improved license management system to simplify the license management in a network.

2. Licensing Management System (LMS)— Available at: https://lms.juniper.net/lcrs/license.do. Use the LMS to activate and manage licenses on Application Acceleration, Firewall/IPSec VPN, Identity and Policy Control (IPC) SRC, IDP Appliances, Junos Space, NSM, STRM/JSA, SBR Carrier, WLC Series and WLM Series.

Table 1 shows the platforms supported in the licensing guide.

Table 1 Platforms Supported in the Licensing Guide

Category	Flex Software License Model	Non-Flex Software License Model
Routing	ACX710, ACX5448, ACX5448-D, ACX5448-M, MX10K3-L2103, MPC5E, MPC7E-10G, MPC7E-MRATE, MPC10E-10C, MPC10E-15C, MX2K-MPC6E, MX2K-MPC8E, MX2K-MPC9E, MX2K-MPC11E, MX10K-LC2101 Line Cards and MX204 Routers, PTX10003, PTX10008, vMX, and vBNG	ACX5448-D, ACX5448-M, M Series, MX Series, MPC5E, MPC7E-10G, MPC7E-MRATE, MX2K-MPC6E, MX2K-MPC8E, MX2K-MPC9E, PTX Series, T Series, and vMX
Security	cSRX, JATP400, JATP700, ATP Appliances, SRX Series, and vSRX	SRX Series and vSRX
Switching	EX2300, EX3400, EX4300, EX4400, and QFX Series Switches	EX Series and QFX Series Switches
Network Management	Apstra, Contrail Service Orchestration (CSO), NFX350, NorthStar Controller, NorthStar Planner, and Paragon Insights	Contrail Service Orchestration, Junos Space, Network and Security Manager (NSM), J-Web Device Manager, and Steel-Belted Radius® Carrier

You can find information about how to activate, install, manage, and monitor licenses on Juniper Networks products in the Licensing User Guide.

Documentation Feedback

We encourage you to provide feedback so that we can improve our documentation. Send your comments to licensing-doc-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

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Flex Software License Model

Overview

Flex Software License Model Overview

Flex Software License Model

The Flex Software License Model is a framework, set of policies, and tools that help unify and thereby simplify Juniper product-driven licensing and packaging.

The major components of the framework are:
1. A focus on customer segments (enterprise, service provider, and cloud) and use cases for Juniper Networks hardware and software products.
2. The introduction of subscription licenses and subscription portability for all Juniper Networks products including Junos OS, Contrail, and Juniper cloud-based services.
3. The introduction of a common, three-tiered model (standard, advanced, and premium) for all Juniper Networks software products.

Getting Started

As a customer ordering a Juniper Networks product under the Flex Software License Model that includes hardware, you order:
1. The hardware platform that includes the standard license.
2. The customer support package that fits your needs.
3. The advanced or premium subscription licenses, according to your use case. These subscription licenses include embedded customer support.

As a customer ordering a Juniper Networks software product, you order:
The standard, advanced, or premium subscription license, according to your use case. These subscription licenses include embedded customer support.

Understanding the Three-Tier Model

As new hardware platforms become available under the Flex Software License Model, you can customize your purchase using one of the following three models:

1. **Standard License**

   The standard license includes the hardware platform and a license to use the software with the standard feature set. Standard Return Material Authorization (RMA) policies apply with no changes in case of hardware failure. Customer support is ordered separately as you select your preferred hardware support policy and support for the standard software features. For more information about support policy, see Contact Support. The hardware platform does not require a separate license, and the software right-to-use (RTU) license is perpetual for the licensed features.

2. **Advanced License**

The advanced license includes the subscription-based license to use the advanced software features. The license term is 1 year, 3 years, or 5 years. Customer support for the software features is included. These features differ by use case and platform. For example, to view the list of features for the QFX Switches, see QFX switch device class and SKUs.

3. **Premium License**

The premium license includes the subscription-based license to use the Junos OS software features. The license term is 1 year, 3 years, or 5 years. Customer support for the software features is included. These features differ by use case and platform. The premium license is a superset and includes all the features from the advanced license and additional features. For example, to view the list of features for the QFX Switches, see QFX switch device class and SKUs.

Figure 1 Three-Tier Model for the Flex Software License Model
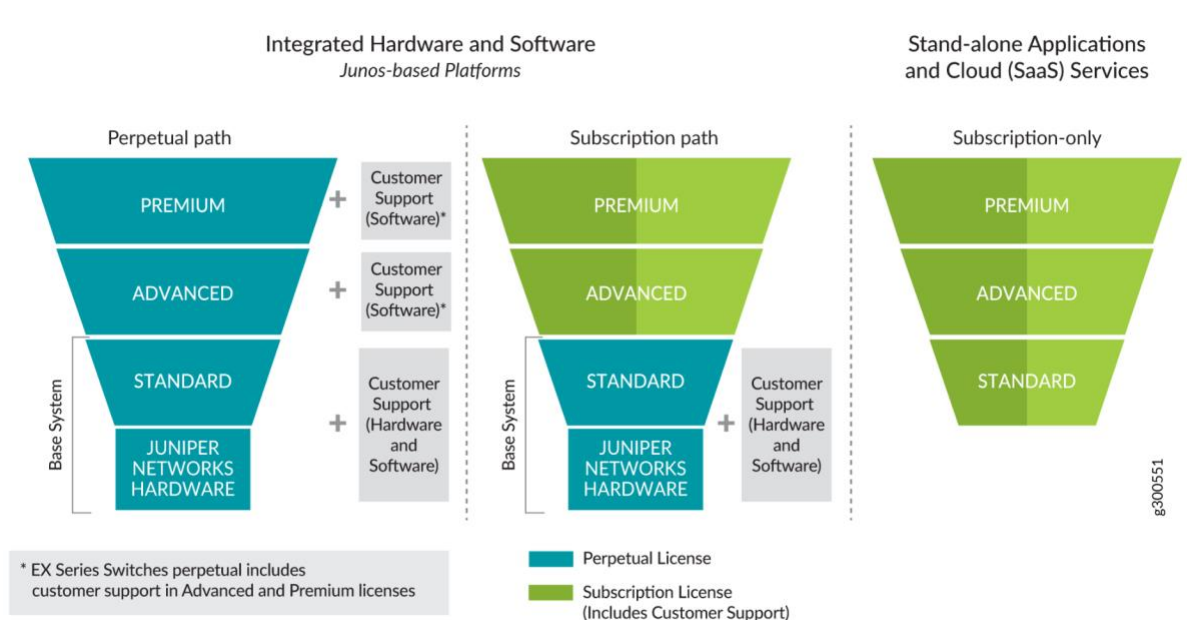
Understanding Perpetual Licenses

All advanced and premium licenses are offered as perpetual licenses under the Flex Software License Model.

Flex Software Perpetual licenses include the following attributes:

1. The perpetual licenses are locked to the chassis on which it is activated.

2. Perpetual licenses are not portable.

3. You must purchase support separately.

4. Premium licenses include all the features in the premium and advanced licenses.

5. Perpetual licenses are available in full bandwidth and pay as you grow model (PAYG).

6. In case of RMA, you can exchange the perpetual license keys to the RMA device. You must contact Juniper Customer Care for exchanging the license keys for RMA devices.

All advanced and premium licenses are offered as subscriptions under the Flex Software License Model. Subscription licenses are available in 1-year, 3-year, or 5-year terms. After the order fulfilment, the subscription period begins after the completion of a 30-day grace period.

Table 2 describes the subscription terms for purchase and number of months to use the license.

Table 2 Subscription Terms Details

Subscription Terms	Number of Months for the License
1-year	13 months
3-year	37 months
5-year	61 months

Flex Software Subscription licenses include the following attributes:

1. Specific products might offer a subset of these licenses. At the end of the term, you have three options:

   2. You can renew the subscription, to continue to use the features and scale granted under the license.

   3. You can order a replacement subscription.

   Upgrading and downgrading the subscription models is supported. In both cases, subscription models are processed as a new order, and you might use the features and scale granted under the new license. For example, you have a 5-year subscription, and you want to downgrade to a 3-year subscription or the other way around.

   4. You might decline to renew or purchase a replacement subscription. In this case, you may no longer use the features and scale granted under the expired subscription. You can continue to use the hardware and any software features which are granted under the perpetual license.

5. Alternatively, when an advanced subscription term expires, your needs may require an upgrade to the premium subscription term.

6. Subscription licenses include Juniper customer support for software features as part of the subscription license, unless customer support is provided by a Juniper partner directly. There is no need to order a separate customer support policy for the advanced and premium licenses.

7. Premium licenses include all the features in the premium and advanced licenses.

8. Subscriptions may be ordered at any time.

9. New software features may be available over time with new software versions.

10. Subscription licenses are portable for similar devices.

11. Subscriptions are cancelable at the end of the term.

12. Renewals are not automatic.

License Portability

Subscription licenses are portable. This means that if you buy a new similar hardware platform, then you can port the subscription license. You can stop using the license on one hardware platform and move it to another hardware platform. This portability allows you to balance features across hardware platforms in the network without having to buy extra feature licenses.

Flex Software License for Routing Devices

Flex Software License for ACX

Table 3 describes the licensing support for the ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L Universal Metro Routers.

1. ACX710, ACX5448, ACX5448-D, and ACX5448-M Universal Metro Routers supported on Junos OS.

2. ACX7100-32C and ACX7100-48L Universal Metro Routers supported on Junos OS Evolved.

Table 3 Supported Features on ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L

License Model	Use Case Examples or Solutions	Detailed Features for Fabric Management	Scale
Standard	Basic Layer 2 only. Layer 3 (with IGP only) for management connectivity	Layer 2 (basic VLAN)	Default Layer 2 scale and 8 queues per port
Advanced	Layer 2 or Layer 3 aggregation, Distributed Access Architecture (DAA), Converged Interconnect Network (CIN), mobile backhaul (BH), fronthaul (FH), or midhaul (MH), and next-generation fiber to the home (NG-FTTH)	Layer 2 VPN (Pseudowire Emulation Edge to Edge, VPLS, EVPN), Layer 3 VPN, timing, E-OAM, HQoS, telemetry, and RFC2544	32 VRFs and 8 NG-MVPN
Premium	Provider edge	With the premium license, you can use all the advanced features that are supported on ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L Universal Metro Routers with full platform scale of FIB and VPNs.	32+ VRFs and 8+ NG-MVPN

Table 4 describes license SKUs for ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L Universal Metro Routers.

Table 4 ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L Universal Metro Routers license SKUs

ACX Universal Metro Routers	License Model	SKUs
ACX710	Standard	ACX710DC
	Advanced	S-ACX-100GE-A1-P
		S-ACX-100GE-A-1*3/5
	Premium	S-ACX-100GE-P1-P
		S-ACX-100GE-P-1*/3/5
ACX5448, ACX5448-D, and ACX5448-M	Standard	ACX5448-AC-AFI
		ACX5448-AC-AFO
		ACX5448-DC-AFI
		ACX5448-DC-AFO
		ACX5448-D-AC-AFO
		ACX5448-D-DC-AFO
		ACX5448-D-AC-AFI
		ACX5448-D-DC-AFI
		ACX5448-M-AC-AFO
		ACX5448-M-DC-AFO
		ACX5448-M-AC-AFI
		ACX5448-M-DC-AFI
	Advanced	S-ACX-400GE-A1-P
		S-ACX-400GE-A-1*/3/5
	Premium	S-ACX-400GE-P1-P
		S-ACX-400GE-P-1*/3/5

ACX Universal Metro Routers	License Model	SKUs
ACX7100-32C	Standard	ACX7100-32C-AC-AO
		ACX7100-32C-DC-AO
	Advanced	S-EACX-400G-A-1 /3/5
		S-EACX-400G-A1-P
		S-EACX-100G-A-1 /3/5
		S-EACX-100G-A1-P
	Premium	S-EACX-400G-P-1 /3/5
		S-EACX-400G-P1-P
		S-EACX-100G-P-1 /3/5
		S-EACX-100G-P1-P
ACX7100-48L	Standard	ACX7100-48L-AC-AI
		ACX7100-48L-AC-AO
		ACX7100-48L-DC-AI
		ACX7100-48L-DC-AO
	Advanced	S-EACX-400G-A-1 /3/5
		S-EACX-400G-A1-P
		S-EACX-100G-A-1 /3/5
		S-EACX-100G-A1-P
	Premium	S-EACX-400G-P-1 /3/5
		S-EACX-400G-P1-P
		S-EACX-100G-P-1 /3/5
		S-EACX-100G-P1-P

*1 year subscription term is for renewal only.

The ACX7100-32C Universal Metro Routers supports MACsec, but you must purchase a license to use the MACsec feature. MACsec licenses are perpetual. The licenses are available in two variants, which are described in the Table 5.

Table 5 MACsec Feature License SKUs

MACsec License SKU	Description
S-ACXEVO100GMSEC-P	100-Gigabit MACsec perpetual license. You can purchase customer support separately.
S-ACXEVO400GMSEC-P	400-Gigabit MACsec perpetual license. You can purchase customer support separately.

Table 6 shows the definition of ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L Universal Metro Routers license SKUs.

Table 6 ACX710, ACX5448, ACX5448-D, ACX5448-M, ACX7100-32C, and ACX7100-48L Universal Metro Routers License SKU Definition

License SKU	SKU Character Description
S-ACX-100GE/400GE-A/A1/P/P1-P/1/3/5 S-EACX-400G/100G-A/A1/P/P1-1/3/5/P	**S**—Software **ACX**—Product name: ACX **400G/100G**—Bandwidth **100GE/400GE**—Bandwidth **A/A1**—Advanced license odel **P/P1**—Premium license odel **1/3/5**—Subscription term: 1 year, 3 years, or 5 years **P**—Perpetual

Flex Software License for cRPD

Table 7 describes the licensing support for Routing Stack for Host on containerized routing protocol process (cRPD).

Table 7 Routing Stack for Host Features on cRPD

License Model	Routing Stack for Host SKUs	Use Case Examples or Solutions	Detailed Features	Scale
Advanced	S-CRPD-A-HR-1/3/5 S-CRPD-100-A-HR-1/3/5 S-CRPD-1K-A-HR-1/3/5 S-CRPD-10K-A-HR-1/3/5	Layer 3 deployments with MPLS or SR starting at the host	Includes the features from Standard tier along with BGP sharding, and enhanced MPLS	Without scale restrictions on BGP peers and RIB
Standard	S-CRPD-S-HR-1/3/5 S-CRPD-100-S-HR-1/3/5 S-CRPD-1K-S-HR-1/3/5 S-CRPD-10K-S-HR-1/3/5	Layer 3 to the IP host	Automation and programmability, BGP, IGP, LSP, MPLS, and telemetry	16 BGP Peers and 4M RIB

Table 8 describes the licensing support with use case examples Route Reflector on containerized routing protocol process (cRPD).

Table 8 Route Reflector Features on cRPD

License Model	Route Reflector SKUs	Use Case Examples or Solutions	Detailed Features	Scale
Advanced-Subscription	S-CRPD-4M-A-RR-1/3/5	Route Reflector	Automation and programmability, default routing instance BGP, BGP sharding, IGP, MPLS, and telemetry	4M RIB No FIB
Advanced-Subscription	S-CRPD-10M-A-RR-1/3/5	Route Reflector	Automation and programmability, default routing instance BGP, BGP sharding, IGP, MPLS, and telemetry	10M RIB No FIB

License Model	Route Reflector SKUs	Use Case Examples or Solutions	Detailed Features	Scale
Advanced-Subscription	S-CRPD-NL-A-RR-1/3/5	Route Reflector	Automation and programmability, default routing instance BGP, BGP sharding, IGP, MPLS, and telemetry	No limit RIB No FIB

Table 9 shows cRPD SKU definition.

Table 9 cRPD SKU Definition

SKU	SKU Character Description
S-CRPD-*S/A*-HR-*1/3/5* S-CRPD-*100/1K/10K*-*S/A*-HR-*1/3/5* S-CRPD-*4M/10M/NL*-A-RR-*1/3/5*	**S**—Software **CRPD**—Product name cRPD **S**—Standard software subscription **A**—Advanced software subscription **HR**—Host Routing **RR**—Route Reflector **100**—Bundle of 100 software licenses **1K**—Bundle of 1000 software licenses **10K**—Bundle of 10000 software licenses **4M**—4 million **10M**—10 million **NL**—No limit **1/3/5**—Subscription term 1, 3, or 5 years

To add, delete, and managing license, refer Managing Licenses.

Flex Software License for MX Series Routers and MPC Service Cards

Table 10 describes the licensing support with use case examples for the MX10K3-L2103, MPC5E, MPC7E-10G, MPC7E-MRATE, MPC10E-10C, MPC10E-15C, MX2K-MPC6E, MX2K-MPC8E, MX2K-MPC9E, MX2K-MPC11E, MX10K-LC2101, MX10K-LC480, MX10K-LC9600 line cards, MX204, and MX304 routers.

MPC10E-10C and MPC10E-15C line cards are supported on MX240, MX480, and MX960 devices

MX2K-MPC11E line cards are supported on MX2010 and MX2020 devices

MX10K3-L2103 line card is supported on MX10003 device

MX10K-LC2101, MX10K-LC480, MX10K-LC9600 line cards are supported on MX10008 and MX10016 devices

Table 10 Supported Features on MX10K3-L2103, MPC5E, MPC7E-10G, MPC7E-MRATE, MPC10E-10C, MPC10E-15C, MX2K-MPC6E, MX2K-MPC8E, MX2K-MPC9E, MX2K-MPC11E, MX10K-LC2101, MX10K-LC480, MX10K-LC9600 Line Cards, MX204, and MX304 Routers

License Model	Use Case Examples or Solutions	Feature Buckets	Scale
Standard	Basic Layer 2 features	Bridging with port and single level VLAN (dot1Q), and LAG	Not Applicable

License Model	Use Case Examples or Solutions	Feature Buckets	Scale
Advanced	Transport	1. IP routing, IGP (OSFP and IS-IS), IP-FRR, PIM variants, and IGMP 2. Internet eBGP peering, BGP multihoming (add path and multi-path), EPE, and BGP PIC 3. BGP Flow specification 4. All Layer 2 services—E-LINE (Layer 2 VPNs, Layer 2 ckt, EVPN VPWS, EVPN FXC), E-LAN (bridging, H-VPLS, EVPN, and IRB), E-TREE (H-VPLS, EVPN, and IRB), Layer 2 multicast (snooping included) 5. All MPLS transport—LDP, RSVP-TE, SR, SR-TE, and MPLS-FRR (including TI-LFA) 6. IP fabrics (GRE, MPLSoUDP, VxLAN, and IPinIP) 7. Streaming telemetry and SNMP 8. Policers, ACLs, J-Flow (sampled), sFLow, port mirroring, and per VLAN queuing 9. Timing (all variants) 10. OAM—BFD, Ethernet CFM or LFM, MPLS or SR (ping and traceroute), services OAM, RPM, and TWAMP 11. HQoS 12. Logical Systems The Junos Fusion Technology feature requires an additional license in addition to Advanced license.	32 IP VPNs – all address families 8 next-generation MVPN

License Model	Use Case Examples or Solutions	Feature Buckets	Scale
Premium	Services	1. Includes all features supported under Advanced Software License 2. High scale IP-VPNs 3. IP fabrics (SRv6 and SRm6) 4. PWHT for Layer 3 VPNs or BNG 5. Inline NAT and inline MDI 6. 1:1 inline J-Flow The subscriber management (BNG or CUPS) feature requires an additional license in addition to Premium license.	32+ IP VPNs 8+ multicast VPNs

Licensing tiers for Flex Software License Model are based on large functional blocks. Features that are not explicitly listed in Premium license are included in Advanced license, except for the following:

1. Junos Fusion Technology requires additional license in addition to Advanced or Premium license.

2. Premium software tier is a prerequisite for running subscriber services (BNG(PL), BNG CUPS, MX Mobile User Plane (SAEGW-U, 5G AGF or UPF)).

The MACsec feature is supported on MX204, MX240, MX304, MX480, MX960, MX2008, MX2010, MX2020, MX10003, MX10004, MX10008, and MX10016 device. These licenses are perpetual.

The minimum number of MACsec bandwidth licenses installed must be greater than or equal to the configured bandwidth of MACsec enabled ports.

The MACsec feature licenses are available in the following variants:

1. S-MX-1C-MSEC-P - 100-Gigabit Ethernet MACsec bandwidth license

2. S-MX-4C-MSEC-P - 400-Gigabit Ethernet MACsec bandwidth license

3. S-MX-4C8-MSEC-P - 480-Gigabit Ethernet MACsec bandwidth license

The following line cards support both flex and non-flex models.

The following line cards are Flex-capable line cards. There will be no alarms or syslog messages for these line cards if license is not installed. However, the MACsec bandwidth usage on these line cards will be tracked.

1. MX10K-LC2101

2. MPC5E-100G10G

3. MPC5EQ100G10G

4. MPC5E-40G10G

5. MPC5EQ-40G10G

6. MX2K-MPC6E

7. MPC7E-10G

8. MPC7E-MRATE

9. MX2K-MPC8E

10. MX2K-MPC9E

The following line cards are Flex-only line cards. The Flex-only line cards requires MACsec bandwidth license. Junos OS displays a warning when you commit the configuration and generates alarms, if the MACsec bandwidth license is not installed.

1. MPC10E-10C

2. MPC10E-15C

3. MX2K-MPC11E

4. MX10KM-LC9600-BASE

5. MX10KM-LC480-BASE

The `show system macsec license` command display the total MACsec bandwidth used by both flex-only line cards and flex-capable line cards.

Table 11 Demonstrates the MACSec Bandwidth License Usage Calculation

Installed MACsec bandwidth license	Flex-only line cards MACsec bandwidth usage	Flex-capable line cards MACsec bandwidth usage	Bandwidth usage displayed for show system license command	Bandwidth usage displayed for show system macsec license command	Alarms or syslog messages
1000G	1000G	600G	1000G	1000 G (flex-only) / 600G (flex-capable)	NO
1000G	500G	600G	1000G	500 G (flex-only) / 600G (flex-capable)	NO
1000G	500G	400G	900G	500G (flex-only) / 400G (flex-capable)	NO
1000G	1200G	400G	1200G	1200 G (flex-only) / 400G (flex-capable)	YES
1000G	0G	1200G	1000G	0 G (flex-only) / 1200G (flex-capable)	NO
0G	500G	0G	500G	500 G (flex-only) / 0 (flex-capable)	YES
0G	0G	500G	0G	0 G (flex-only) / 500G (flex-capable)	NO

Table 12 describes SKUs for MX10K3-L2103, MPC5E, MPC7E-10G, MPC7E-MRATE, MPC10E-10C, MPC10E-15C, MX2K-MPC6E, MX2K-MPC8E, MX2K-MPC9E, MX2K-MPC11E, MX10K-LC2101, MX10K-LC480, MX10K-LC9600 Line Cards, MX204, and MX304 Routers.

Table 12 MX10K3-L2103, MPC5E, MPC7E-10G, MPC7E-MRATE, MPC10E-10C, MPC10E-15C, MX2K-MPC6E, MX2K-MPC8E, MX2K-MPC9E, MX2K-MPC11E, MX10K-LC2101, MX10K-LC480, MX10K-LC9600 Line Cards, MX204, and MX304 Routers SKUs

Product Model	License Model	SKUs
MX304	Subscription	MX304-BASE
		MX304-PREM
		MX304-LMIC16-BASE
		S-MX-16C-A1-C1-3/5/1*
		S-MX-16C-P1-C1-3/5/1*
		S-MX-1C-A1-C1-3/5/1*
		S-MX-1C-P1-C1-3/5/1*
MX304	Perpetual	MX304-BASE
		MX304-PREM
		MX304-LMIC16-BASE
		S-MX-16C-A1-C1-P
		S-MX-16C-P1-C1-P
		S-MX-1C-A1-C1-P
		S-MX-1C-P1-C1-P
MX204	Subscription	MX204-HW-BASE
		S-MX-4C-A1-C1-3/5/1*
		S-MX-4C-P1-C1-3/5/1*
MX204	Perpetual	MX204-HW-BASE
		S-MX-4C-A1-C1-P
		S-MX-4C-P1-C1-P
MX10K3-L2103 Supported on MX10003 device	Subscription	MX10K3-L2103-BASE
		S-MX-12C-A1-C1-3/5/1*
		S-MX-12C-P1-C1-3/5/1*

Product Model	License Model	SKUs
MX10K3-L2103 Supported on MX10003 device	Perpetual	MX10K3-L2103-BASE S-MX-12C-A1-C1-P S-MX-12C-P1-C1-P
MPC5E Supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020	Subscription	MPC5E-40G10G MPC5EQ-40G10G MPC5E-100G10G MPC5EQ-100G10G S-MX-2C4-A1-3/5/1* S-MX-2C4-P1-3/5/1*
MPC5E Supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020	Perpetual	MPC5E-40G10G MPC5EQ-40G10G MPC5E-100G10G MPC5EQ-100G10G S-MX-2C4-A1-P S-MX-2C4-P1-P
MPC7E-10G Supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020	Subscription	MPC7E-10G S-MX-4C-A1-3/5/1* S-MX-4C-P1-3/5/1*
MPC7E-10G Supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020	Perpetual	MPC7E-10G S-MX-4C-A1-P S-MX-4C-P1-P
MPC7E-MRATE Supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020	Subscription	MPC7E-MRATE S-MX-4C8-A1-3/5/1* S-MX-4C8-P1-3/5/1*

Product Model	License Model	SKUs
MPC7E-MRATE Supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020	Perpetual	MPC7E-MRATE S-MX-4C8-A1-P S-MX-4C8-P1-P
MPC10E-10C Supported on MX240, MX480, and MX960 devices	Subscription	MPC10E-10C-P-BASE S-MX-10C-A1-3/5/1* S-MX-10C-P1-3/5/1*
MPC10E-10C Supported on MX240, MX480, and MX960 devices	Perpetual	MPC10E-10C-P-BASE S-MX-10C-A1-P S-MX-10C-P1-P
MPC10E-15C Supported on MX240, MX480, and MX960 devices	Subscription	MPC10E-15C-P-BASE S-MX-15C-A1-3/5/1* S-MX-15C-P1-3/5/1*
MPC10E-15C Supported on MX240, MX480, and MX960 devices	Perpetual	MPC10E-15C-P-BASE S-MX-15C-A1-P S-MX-15C-P1-P
MX2K-MPC6E Supported on MX2008, MX2010, and MX2020 devices	Subscription	MX2K-MPC6E S-MX-2C-A1-3/5/1* S-MX-2C-P1-3/5/1* S-MX-2C4-A1-3/5/1* S-MX-2C4-P1-3/5/1* S-MX-4C-A1-3/5/1* S-MX-4C-P1-3/5/1*

Product Model	License Model	SKUs
MX2K-MPC6E Supported on MX2008, MX2010, and MX2020 devices	Perpetual	MX2K-MPC6E S-MX-2C-A1-P S-MX-2C-P1-P S-MX-2C4-A1-P S-MX-2C4-P1-P S-MX-4C-A1-P S-MX-4C-P1-P
MX2K-MPC8E Supported on MX2008, MX2010, and MX2020 devices	Subscription	MX2K-MPC8E S-MX-4C8-A1-3/5/1* S-MX-4C8-P1-3/5/1* S-MX-8C-A1-3/5/1* S-MX-8C-P1-3/5/1*
MX2K-MPC8E Supported on MX2008, MX2010, and MX2020 devices	Perpetual	MX2K-MPC8E S-MX-4C8-A1-P S-MX-4C8-P1-P S-MX-8C-A1-P S-MX-8C-P1-P
MX2K-MPC9E Supported on MX2008, MX2010, and MX2020 devices	Subscription	MX2K-MPC9E S-MX-8C-A1-3/5/1* S-MX-8C-P1-3/5/1*
MX2K-MPC9E Supported on MX2008, MX2010, and MX2020 devices	Perpetual	MX2K-MPC9E S-MX-8C-A1-P S-MX-8C-P1-P

Product Model	License Model	SKUs
MX10K-LC2101 Supported on MX10008 and MX10016 devices	Subscription	MX10K-LC2101-BASE S-MX-24C-A1-3/5/1* S-MX-24C-P1-3/5/1*
MX10K-LC2101 Supported on MX10008 and MX10016 devices	Perpetual	MX10K-LC2101-BASE S-MX-24C-A1-P S-MX-24C-P1-P
MX10K-LC480 Supported on MX10008 and MX10016	Subscription	MX10K-LC480-BASE S-MX-4C8-A1-3/5/1* S-MX-4C8-P1-3/5/1*
MX10K-LC480 Supported on MX10008 and MX10016	Perpetual	MX10K-LC480-BASE S-MX-4C8-A1-P S-MX-4C8-P1-P
MX10K-LC9600 Supported on MX10008	Subscription	MX10K-LC9600-BASE S-MX-96C-A1-3/5/1* S-MX-96C-P1-3/5/1*
MX10K-LC9600 Supported on MX10008	Perpetual	MX10K-LC9600-BASE S-MX-96C-A1-P S-MX-96C-P1-P
MX2K-MPC11E Supported on MX2010 and MX2020 devices	Subscription	MX2K-MPC11E-BASE S-MX-40C-A1-3/5/1* S-MX-40C-P1-3/5/1*
MX2K-MPC11E Supported on MX2010 and MX2020 devices	Perpetual	MX2K-MPC11E-BASE S-MX-40C-A1-P S-MX-40C-P1-P

*1 year subscription term is for renewal only.

MX-SPC3 Services Card

Table 13 describes the licensing support with use case examples for the MX-SPC3 services card.

Table 13 Supported Features on MX-SPC3 Services Card

License Model	Use Case Examples or Solutions	Detailed Features	License SKUs
Standard	Enterprise data center; service provider edge and data center	Traffic Load Balancer (TLB)	MX-SPC3
Advanced 1	Enterprise data center and edge; service provider edge	Carrier-grade NAT (CGNAT)	S-MXSPC3-A1-1 S-MXSPC3-A1-3 S-MXSPC3-A1-5 S-MXSPC3-A1-P
Advanced 2	Service provider edge; Gi firewall for mobile operators; enterprise edge and data center	Stateful firewall	S-MXSPC3-A2-1 S-MXSPC3-A2-3 S-MXSPC3-A2-5 S-MXSPC3-A2-P
Advanced 3	Advanced threat intelligence	Intrusion detection system (IDS)	S-MXSPC3-A3-1 S-MXSPC3-A3-3 S-MXSPC3-A3-5 S-MXSPC3-A3-P
Premium 1	Enterprise data center and edge; service provider edge	CGNAT, DNS sinkhole, IDS, stateful firewall, and URL filtering	S-MXSPC3-P1-1 S-MXSPC3-P1-3 S-MXSPC3-P1-5 S-MXSPC3-P1-P
Premium 2	Service provider edge; Gi firewall for mobile operators; enterprise edge and data center	CGNAT, DNS sinkhole, IDS, stateful firewall, and URL filtering	S-MXSPC3-P2-1 S-MXSPC3-P2-3 S-MXSPC3-P2-5 S-MXSPC3-P2-P

License Model	Use Case Examples or Solutions	Detailed Features	License SKUs
Premium 3	Advanced threat intelligence	DNS sinkhole, IDS, and URL filtering	S-MXSPC3-P3-1 S-MXSPC3-P3-3 S-MXSPC3-P3-5 S-MXSPC3-P3-P
IPsec – Half card	IPsec	Site to Site VPN, Dynamic Endpoint, and AutoVPN	S-MXSPC3-1-IPSEC-1 S-MXSPC3-1-IPSEC-3 S-MXSPC3-1-IPSEC-5 S-MXSPC3-1-IPSEC-P
IPsec – Full card	IPsec	Site to Site VPN, Dynamic Endpoint, and AutoVPN	S-MXSPC3-2-IPSEC-1 S-MXSPC3-2-IPSEC-3 S-MXSPC3-2-IPSEC-5 S-MXSPC3-2-IPSEC-P

IPsec* – Group VPN, Intra HA, policy-based VPN, passive mode, IPsec tunnel trace route are not supported.

Table 14 defines the parts of a MX-SPC3 SKU definition.

Table 14 MX-SPC3 SKU Definition

SKU	SKU Character Description
S-MXSPC3-A1/A2/A3/P1/P2/P3-1/3/5/P S-MXSPC3-1/2-IPSEC-1/3/5/P	S—Software MXSPC3— Product name: MXSPC3 line card A1/A2/A3—Advanced 1 or advanced 2 or advanced 3 software features P1/P2/P3—Premium 1 or premium 2 or premium 3 software features 1/2-IPSEC—Supported IPsec VPN features list 1/3/5—Subscription term 1 or 3 or 5 years P—Perpetual license

Flex Software License for PTX Series Routers

The PTX Flex license are soft enforced. Irrespective of license(s) installed there is no impact to the features, scale, or traffic. The PTX Series device reports warning through the syslog, alarms, and CLI messages to indicate the missing license.

Table 15 describes the licensing support for the PTX10001-36MR, PTX10003, PTX10004, PTX10008 and PTX10016 Packet Transport Router.

Table 15 Licensed Features on PTX10001-36MR, PTX10003, PTX10004, PTX10008 and PTX10016 Devices

License Model	Supported Features	Scale (Maximum Allowed)
Standard	Filters (Layer 2 and Layer 3), Layer 2 (*x*STP, 802.1Q, LAG), Layer 3 (static), quality of service or QoS (Layer 2 and Layer 3), SNMP, and VLAN	64,000 forwarding information bases (FIBs) and 64,000 routing information bases (RIBs), 1000 firewall filters, and 4000 firewall terms
Advanced	A1	
	Standard features, BGP, FBF, GRE, IS-IS, Junos telemetry interface (JTI), OSPF, VR, and VRRP	256,000 FIBs, 3 million RIBs, 1000 BGP peers, 1000 IP tunnels, 16,000 PIMs, 4000 firewall filters, and 16,000 firewall terms
	A2	
	A1 features, connectivity fault management (CFM), EVPN-VXLAN, VRF (VXLAN), VXLAN, VRF/Layer 3 VPN (VXLAN), Q-in-Q, ESI-LAG, Precision Time Protocol (PTP), PTP-BC, and Synchronous Ethernet	1 million FIBs, 3 million RIBs, 1000 LSPs, 1000 BGP peers, 3000 IP tunnels, 1000 VRFs, 32,000 PIMs, 16,000 firewall filters, and 64,000 firewall terms
Premium	P1	
	A2 features, EVPN-MPLS , Layer 2 circuit, Layer 3 VPN, LDP, MPLS, RSVP, segment routing, Layer 3 Multicast, PCEP, PIM, and SR-TE	2 million FIBs, 6 million RIBs, 32,000 LSPs, 2000 BGP peers, 5000 IP tunnels, 1000 VRFs (VXLAN), 32 VRFs (MPLS Layer3 VPN), 32,000 PIMs, 16,000 firewall filters, and 64,000 firewall terms
	P2	

License Model	Supported Features	Scale (Maximum Allowed)
	P1 features and H-QoS	4 million FIBs, IP tunnels are up to the device capacity, 80 million RIBs, 128,000+ LSPs, 4000 BGP peers, 1000+ VRFs (VXLAN), 4000 VRFs (MPLS Layer 3 VPN), 100,000 PIMs, 64,000 firewall filters and terms

In addition, you can install additional port bandwidth usage license to increase the port bandwidth usage.

For PTX10001-36MR, PTX10003, PTX10004, PTX10008 and PTX10016, the Flex Software License Model supports subscription portability for the cloud, enterprise, and service provider segments.

For feature support on the PTX10001-36MR, PTX10003, PTX10004, PTX10008 and PTX10016, see Feature Explorer or contact customer support.

The PTX10001-36MR, PTX10003, PTX10004, PTX10008 and PTX10016 supports MACsec, but you must purchase a license to use the MACsec feature. MACsec licenses are perpetual. The licenses are available in two variants, which are described in the Table 16.

Table 16 MACsec Feature License SKUs

MACsec License SKU	Description
S-PTX10K100GMSEC-P	100-Gigabit Ethernet MACsec license; can be applied to one 100-Gigabit Ethernet port or two 40-Gigabit Ethernet ports
S-PTX10K400GMSEC-P	400-Gigabit Ethernet MACsec license; can be applied to one 400-Gigabit Ethernet port or four 100-Gigabit Ethernet ports

The minimum number of MACsec licenses installed must be equal to the configured bandwidth of MACsec enabled ports. If you enable MACsec on two 400G ports, then two S-PTX10K400GMSEC-P licenses or eight S-PTX10K100GMSEC-P must be installed.

Table 17 describes SKUs for the PTX10000 14.4-Tbps line card.

Table 17 PTX10000 14.4-Tbps Line-Card License SKUs

Line Card	License Model	SKU
PTX10000 14.4-Tbps line card	Perpetual	PTX10K-LC1201-36CD PTX10K-LC1202-36MR
PTX10000 14.4-Tbps license without customer support	Perpetual	S-PTX10K-144C-A1/A2-P S-PTX10K-144C-P1/P2-P
PTX10000 14.4-Tbps license with customer support	Subscription	S-PTX10K-144C-A1/A2-3/5 S-PTX10K-144C-P1/P2-3/5

Table 18 describes partner SKUs for the PTX10000 14.4-Tbps line card.

Table 18 PTX10000 14.4-Tbps Line-Card Partner License SKUs

Line Card	License Model	SKU
PTX10000 14.4-Tbps line card with customer support	Subscription	S-PARPTX10K144CA13 S-PARPTX10K144CA23 S-PARPTX10K144CA15 S-PARPTX10K144CA25 S-PARPTX10K144CP13 S-PARPTX10K144CP15 S-PARPTX10K144CP23 S-PARPTX10K144CP25

Line Card	License Model	SKU
PTX10001-36MR licenses with customer support	Subscription	S-PAR-PT10K108CA13 S-PAR-PT10K108CA15 S-PAR-PT10K108CA23 S-PAR-PT10K108CA25 S-PAR-PT10K108CP13 S-PAR-PT10K108CP15 S-PAR-PT10K108CP23 S-PAR-PT10K108CP25

Table 19 describes SKUs for the PTX10001-36MR.

Table 19 PTX10001-36MR License SKUs

Line Card	License Model	SKU
PTX10001-36MR	Perpetual	PTX10001-36MR-AC PTX10001-36MR-DC
PTX10001-36MR licenses without customer support	Perpetual	S-PTX10K-108C-A1/A2-P S-PTX10K-108C-P1/P2-P
PTX10001-36MR licenses with customer support	Subscription	S-PTX10K-108C-A1/A2-3/5 S-PTX10K-108C-P1/P2-3/5

Table 20 describes SKUs for the PTX10003.

Table 20 PTX10003 License SKUs

Line Card	License Model	SKU
PTX10003	Perpetual	PTX10003-160C-AC PTX10003-160C-DC PTX10003-80C-AC PTX10003-80C-DC
PTX10003 licenses without customer support	Perpetual	S-PTX10K3-16T-A1/A2-P S-PTX10K3-16T-P1/P2-P S-PTX10K3-8T-A1/A2-P S-PTX10K3-8T-P1/P2-P

Line Card	License Model	SKU
PTX10003 licenses with customer support	Subscription	S-PTX10K3-16T-A1/A2-3/5 S-PTX10K3-16T-P1/P2-3/5 S-PTX10K3-8T-A1/A2-3/5 S-PTX10K3-8T-P1/P2-3/5

Table 21 defines the parts of a PTX10000 SKU definition.

Table 21 PTX10000 SKU Definition

SKU	SKU Character Description
S-PTX10K-144C/108C-A1/A2/P1/P2-P S-PTX10K-144C/108C-A1/A2/P1/P2-3/5 S-PARPTX10K144C*A1/A2/P1/P2/3/5* S-PAR-PT10K108CA1/A2/P1/P2/3/5	**S**—Software **PTX10K**—Product name: PTX10000 line of routers **144C**—14.4 Tbps **108C**—10.8 Tbps **PAR**—Partner **A1/A2**—Advanced 1 or advanced 2 software features **P1/P2**—Premium 1 or premium 2 software features **3/5**—Subscription term 3 or 5 years
S-PTX10K3-16T/8T-A1/A2/P1/P2-P/3/5	**S**—Software **PTX10K3**—Product name: PTX10003 line of routers **16T**—16 Tbps **8T**—8 Tbps **A1/A2**—Advanced 1 or advanced 2 software features **P1/P2**—Premium 1 or premium 2 software features **P**—Perpetual license **3/5**—Subscription term 3 or 5 years

Flex Software License for vBNG Routers

Table 22 describes the licensing support for the vBNG.

Table 22 Supported Features on vBNG

License Model	Use Cases	Feature Package Description	Platforms
Subscriber Services Wireline Broadband Lite	Wireline Broadband: 1. Residential 2. Business Services 3. Wholesale (LAC and LNS) Filters (Layer 2 and Layer 3), Layer 2 (*x*STP, 802.1Q, LAG), Layer 3 (static), quality of service or QoS (Layer 2 and Layer 3), SNMP, and VLAN	IPoE, L2TP, PPPoE, PWHT, and WAG Radius and Diameter AAA and Policy Management Lawful Intercept for wireline	vMX

Table 23 describes license SKUs for vBNG Routers.

Table 23 vBNG license SKUs

License Model	SKUs
Subscriber Services Wireline Broadband Lite	Software SKUs 1. S-MX-SSBL-1K-P 2. S-MX-SSBL-10K-P Support SKUs 1. SVC-COR-MX-BL-1KP 2. SVC-COR-MX-BL-10KP

Flex Software License for vMX Routers

Table 24 describes the licensing support for the vMX routers.

Table 24 Supported Features on vMX Routers

License Model	Use Cases Examples or Solutions	Feature Package Description	Platforms
Advanced	Transport Filters (Layer 2 and Layer 3), Layer 2 (*x*STP, 802.1Q, LAG), Layer 3 (static), quality of service or QoS (Layer 2 and Layer 3), SNMP, and VLAN	1. IP routing, IGP (OSFP and IS-IS), IP fast-route, PIM variants, and IGMP 2. Internet eBGP peering, BGP multihoming (add path and multi-path), EPE, and BGP Prefix-Independent Convergence (PIC) 3. BGP Flow Specification 4. All Layer 2 services—E-LINE (Layer 2 VPNs, Layer 2 circuit, EVPN-VPWS, EVPN-FXC), E-LAN (bridging, H-VPLS, EVPN, and IRB), E-Tree (H-VPLS, EVPN, and IRB), Layer 2 multicast (snooping included) 5. MPLS transport—LDP and RSVP-TE 6. Streaming telemetry and SNMP 7. Policers, J-Flow (sampled), sFLow, port mirroring, and per VLAN queuing 8. OAM — BFD, Ethernet CFM or LFM, MPLS or SR (ping and traceroute), services OAM, RPM, and TWAMP The Junos Fusion Technology feature requires an additional license in addition to Advanced license.	vMX

License Model	Use Cases Examples or Solutions	Feature Package Description	Platforms
Premium	Services	1. Includes Advanced features 2. High scale IP VPNs 3. PWHT for Layer 3 VPNs or BNG 4. Inline NAT and inline MDI 5. 1:1 inline J-Flow 6. SRv6 The subscriber management (BNG or CUPS) feature requires an additional license in addition to Premium license.	

Flex Software License Model are based on large functional blocks. Features that are not explicitly listed in Premium license are included in Advanced license, except for the following:

1. Junos Fusion Technology requires additional license in addition to Advanced or Premium license.

2. Premium software tier is a prerequisite for running subscriber services (BNG(PL), BNG CUPS, MX Mobile User Plane (SAEGW-U, 5G AGF or UPF)).

Table 25 describes license SKUs for vMX Routers.

Table 25 vMX and MX Series 3D Universal Edge Routers SKUs

Product Model	License Model	SKUs
vMX	Advanced	S-VMX-100G-A-P
		S-VMX-40G-A-P
		S-VMX-10G-A-P
		S-VMX-1G-A-P
		S-VMX-100M-A-P
		S-VMX-250M-A-P
		S-VMX-250M-A-P
		S-VMX-5G-A-P
vMX	Premium	S-VMX-100G-P-P
		S-VMX-40G-P-P
		S-VMX-10G-P-P
		S-VMX-5G-P-P
		S-VMX-1G-P-P
		S-VMX-500M-P-P
		S-VMX-250M-P-P
		S-VMX-100M-P-P

S

Flex Software License for Switching Devices

Flex Software License for EX Series Switches

EX2300, EX3400, and EX4300

EX2300, EX3400, EX4300 series switches support Flex Software License Model as well as the non-Flex Software License Model.

EX Flex License Model

The Flex License Model supports both Flex Subscription and Flex Perpetual licenses. It is a Three-Tier licensing model. The tiers are Standard, Advanced, and Premium.

Premium license includes Junos features which are offered in the Advanced license.

The Advanced and Premium licenses are Class based, determined by the number of access ports on the switch. Class 1 (C1) switches have 12 ports, Class 2 (C2) switches have 24 ports, and Class 3 (C3) switches have 32 or 48 ports.

Customer support for Advanced and Premium Licenses is included with EX hardware support SKUs.

EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 for Flex Software Subscription License Model

EX Flex Subscription licenses are offered for one year, three year, and five year terms. In addition to Junos features, the Flex Advanced and Premium subscription licenses include Juniper Mist Wired Assurance and VNA or Marvis subscriptions.

Flex Advanced and Premium Subscription licenses allow license portability across EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 for the same Tier and Class of switches.

The following statements are applicable to EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 for flex software subscription model licensing without customer support:

1. Flex software subscription Advanced and Premium licenses include **Wired Assurance** and **Virtual Network Assistant (Marvis)** subscription.

2. Flex Premium subscription license includes Junos features which are offered in the Advanced Subscription license.

3. Flex subscription licenses are portable across EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 for the same Tier and Class of switches.

4. In a Virtual Chassis (VC) deployment, every VC member requires a Flex subscription feature license or perpetual feature license.

5. There are no separate support SKUs for EX Flex Subscription licenses. Support for Advanced and Premium subscription licenses must include some level of EX hardware support SKUs, like CORE or Next Day or Same Day, and so on.

Flex Advanced and Premium subscription licenses are offered with and without EX hardware customer support.

Table 26 EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 switch device class and subscription SKUs with SVC CORE or Next Day or Same Day hardware customer support

EX Series Product Class	EX Device Models	Subscription SKUs
Class 1	EX2300-C-12P EX2300-C-12P-TAA EX2300-C-12P-VC EX2300-C-12T EX2300-C-12T-TAA EX2300-C-12T-VC EX4100-F-12P EX4100-F-12T	S-EX-A-C1-1-COR S-EX-A-C1-3-COR S-EX-A-C1-5-COR S-EX-A-C1-1-ND S-EX-A-C1-3-ND S-EX-A-C1-5-ND S-EX-A-C1-1-SD S-EX-A-C1-3-SD S-EX-A-C1-5-SD
Class 2	EX2300-24MP EX2300-24P EX2300-24P-TAA EX2300-24P-VC EX2300-24T EX2300-24T-DC EX2300-24T-TAA EX2300-24T-VC EX2300-24MP-TAA	S-EX-A-C2-1-COR S-EX-A-C2-3-COR S-EX-A-C2-5-COR S-EX-A-C2-1-ND S-EX-A-C2-3-ND S-EX-A-C2-5-ND S-EX-A-C2-1-SD S-EX-A-C2-3-SD S-EX-A-C2-5-SD S-EX-P-C2-P S-EX-P-C2-1-COR S-EX-P-C2-3-COR S-EX-P-C2-5-COR S-EX-P-C2-1-ND S-EX-P-C2-3-ND S-EX-P-C2-5-ND

EX Series Product Class	EX Device Models	Subscription SKUs
	EX3400-24P EX3400-24P-TAA EX3400-24T EX3400-24T-DC EX3400-24T-TAA EX4100-24P EX4100-24T EX4100-24T-DC EX4100-F-24P EX4100-F-24T EX4300-24P EX4300-24T EX4400-24P EX4400-24P-TAA EX4400-24T EX4400-24T-AFI EX4400-24T-AFI-TAA EX4400-24T-DC EX4400-24T-DC-AFI EX4400-24T-DC-TAA EX4400-24T-TAA EX4400-24MP	S-EX-A-C2-1-COR S-EX-A-C2-3-COR S-EX-A-C2-5-COR S-EX-A-C2-1-ND S-EX-A-C2-3-ND S-EX-A-C2-5-ND S-EX-A-C2-1-SD S-EX-A-C2-3-SD S-EX-A-C2-5-SD S-EX-P-C2-P S-EX-P-C2-1-COR S-EX-P-C2-3-COR S-EX-P-C2-5-COR S-EX-P-C2-1-ND S-EX-P-C2-3-ND S-EX-P-C2-5-ND
Class 3	EX2300-48MP EX2300-48P EX2300-48P-TAA EX2300-48P-VC EX2300-48T EX2300-48T-TAA EX2300-48T-VC EX2300-48MP-TAA	S-EX-A-C3-1-COR S-EX-A-C3-3-COR S-EX-A-C3-5-COR S-EX-A-C3-1-ND S-EX-A-C3-3-ND S-EX-A-C3-5-ND S-EX-A-C3-1-SD S-EX-A-C3-3-SD S-EX-A-C3-5-SD S-EX-P-C3-1-COR S-EX-P-C3-3-COR S-EX-P-C3-5-COR

EX Series Product Class	EX Device Models	Subscription SKUs
	EX3400-48P EX3400-48P-TAA EX3400-48T EX3400-48T-AFI EX3400-48T-AFI-TAA EX3400-48T-TAA EX4100-48P EX4100-48T EX4100-48T-AFI EX4100-48T-DC EX4100-F-48P EX4100-F-48T EX4300-32F EX4300-48MP EX4300-48P EX4300-48P-TAA EX4300-48T EX4300-48T-AFI EX4300-48T-DC EX4400-48F EX4400-48F-AFI EX4400-48F-AFI-TAA EX4400-48F-DC EX4400-48F-DC-AFI EX4400-48F-DC-TAA EX4400-48F-TAA EX4400-48P EX4400-48P-TAA EX4400-48T EX4400-48T-AFI EX4400-48T-AFI-TAA EX4400-48T-DC EX4400-48T-DC-AFI EX4400-48T-DC-TAA EX4400-48T-TAA EX4400-48MP EX4300-48MP-TAA	S-EX-A-C3-1-COR S-EX-A-C3-3-COR S-EX-A-C3-5-COR S-EX-A-C3-1-ND S-EX-A-C3-3-ND S-EX-A-C3-5-ND S-EX-A-C3-1-SD S-EX-A-C3-3-SD S-EX-A-C3-5-SD S-EX-P-C3-1-COR S-EX-P-C3-3-COR S-EX-P-C3-5-COR

EX Series Product Class	EX Device Models	Subscription SKUs
Class 1	EX2300-C-12P EX2300-C-12P-TAA EX2300-C-12P-VC EX2300-C-12T EX2300-C-12T-TAA EX2300-C-12T-VC EX4100-F-12P EX4100-F-12T	S-EX-A-C1-1 S-EX-A-C1-3 S-EX-A-C1-5
Class 2	EX2300-24MP-TAA EX2300-24MP EX2300-24P EX2300-24P-TAA EX2300-24P-VC EX2300-24T EX2300-24T-DC EX2300-24T-TAA EX2300-24T-VC	S-EX-A-C2-1 S-EX-A-C2-3 S-EX-A-C2-5
	EX3400-24P EX3400-24P-TAA EX3400-24T EX3400-24T-DC EX3400-24T-TAA EX4100-24P EX4100-24T EX4100-24T-DC EX4100-F-24PEX4100-F-24T EX4300-24P EX4300-24T EX4400-24P EX4400-24P-TAA EX4400-24T EX4400-24T-AFI EX4400-24T-AFI-TAA EX4400-24T-DC EX4400-24T-DC-AFI EX4400-24T-DC-TAA EX4400-24T-TAA EX4400-24MP	S-EX-P-C2-1 S-EX-P-C2-3 S-EX-P-C2-5

EX Series Product Class	EX Device Models	Subscription SKUs
Class 3	EX2300-48MP EX2300-48P EX2300-48P-TAA EX2300-48P-VC EX2300-48T EX2300-48T-TAA EX2300-48T-VC EX2300-48MP-TAA	S-EX-A-C3-1 S-EX-A-C3-3 S-EX-A-C3-5

EX Series Product Class	EX Device Models	Subscription SKUs
	EX3400-48P EX3400-48P-TAA EX3400-48T EX3400-48T-AFI EX3400-48T-AFI-TAA EX3400-48T-TAA EX4100-48P EX4100-48T EX4100-48T-AFI EX4100-48T-DC EX4100-F-48P EX4100-F-48T EX4300-32F EX4300-48MP EX4300-48P EX4300-48P-TAA EX4300-48T EX4300-48T-AFI EX4300-48T-DC EX4400-48F EX4400-48F-AFI EX4400-48F-AFI-TAA EX4400-48F-DC EX4400-48F-DC-AFI EX4400-48F-DC-TAA EX4400-48F-TAA EX4400-48P EX4400-48P-TAA EX4400-48T EX4400-48T-AFI EX4400-48T-AFI-TAA EX4400-48T-DC EX4400-48T-DC-AFI EX4400-48T-DC-TAA EX4400-48T-TAA EX4400-48MP EX4300-48MP-TAA	S-EX-P-C3-1 S-EX-P-C3-3 S-EX-P-C3-5

EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 Flex Software Perpetual License Model

EX Flex Advanced and Premium perpetual licenses includes Junos features only. They *do not* include **Juniper Mist Wired Assurance** subscription.

The following statements are applicable to EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 Flex Perpetual licensing model:

1. On EX3400, EX4100, and EX4400 switches, the flow-based telemetry and MACsec features are supported. A separate license is required to use these features.

    1. On EX4400 switch, use the S-EX-FBT-P license SKU for flow-based telemetry feature.

    2. On EX4100 and EX4100-F switches, use the S-EX4100-FBT-P license SKU for flow-based telemetry feature.

    3. Use the S-EX-MACSEC-C2-P and S-EX-MACSEC-C3-P for MACsec feature.

    4. In a Virtual Chassis deployment, a separate license is required for each member where the MACsec or flow-based telemetry functionality is configured.

5. Flex Perpetual Advanced and Premium licenses *do not* include **Juniper Mist Wired Assurance** and VNA (Marvis) subscription.

6. Flex Premium perpetual license includes Junos features which are offered in the Advanced perpetual license.

7. Flex Perpetual licenses are not portable. Licenses are tied to the serial number of the EX chassis. In case of RMA, you can exchange the perpetual license keys to the RMA device. You must contact Juniper Customer Care for exchanging the license keys for RMA devices.

8. In a Virtual Chassis (VC) deployment, each VC member requires a Flex perpetual feature license

9. There are no separate support SKUs for EX Flex perpetual licenses. Support for Advanced and Premium Flex perpetual licenses is included with EX hardware support SKUs.

Table 27 EX2300, EX3400, EX4100, EX4100-F, EX4300, and EX4400 switch device class and SKUs

EX Series Product Class	EX Device Models	Perpetual SKUs
Class 1	EX2300-C-12P EX2300-C-12P-TAA EX2300-C-12P-VC EX2300-C-12T EX2300-C-12T-TAA EX2300-C-12T-VC	S-EX-A-C1-P
Class 2	EX2300-24MP-TAA EX2300-24MP EX2300-24P EX2300-24P-TAA EX2300-24P-VC EX2300-24T EX2300-24T-DC EX2300-24T-TAA EX2300-24T-VC	S-EX-A-C2-P
	EX3400-24P EX3400-24P-TAA EX3400-24T EX3400-24T-DC EX3400-24T-TAA EX4100-24P EX4100-24T EX4100-24T-DC EX4100-F-24P EX4100-F-24T EX4300-24P EX4300-24T EX4400-24P EX4400-24P-TAA EX4400-24T EX4400-24T-AFI EX4400-24T-AFI-TAA EX4400-24T-DC EX4400-24T-DC-AFI EX4400-24T-DC-TAA EX4400-24T-TAA EX4400-24MP	S-EX-A-C2-P S-EX-P-C2-P

EX Series Product Class	EX Device Models	Perpetual SKUs
Class 3	EX2300-48MP EX2300-48P EX2300-48P-TAA EX2300-48P-VC EX2300-48T EX2300-48T-TAA EX2300-48T-VC EX2300-48MP-TAA	S-EX-A-C3-P

EX Series Product Class	EX Device Models	Perpetual SKUs
	EX3400-48P	S-EX-A-C3-P
	EX3400-48P-TAA	S-EX-P-C3-P
	EX3400-48T	
	EX3400-48T-AFI	
	EX3400-48T-AFI-TAA	
	EX3400-48T-TAA	
	EX4100-48P	
	EX4100-48T	
	EX4100-48T-AFI	
	EX4100-48T-DC	
	EX4100-F-48P	
	EX4100-F-48T	
	EX4300-32F	
	EX4300-48MP	
	EX4300-48P	
	EX4300-48P-TAA	
	EX4300-48T	
	EX4300-48T-AFI	
	EX4300-48T-DC	
	EX4400-48F	
	EX4400-48F-AFI	
	EX4400-48F-AFI-TAA	
	EX4400-48F-DC	
	EX4400-48F-DC-AFI	
	EX4400-48F-DC-TAA	
	EX4400-48F-TAA	
	EX4400-48P	
	EX4400-48P-TAA	
	EX4400-48T	
	EX4400-48T-AFI	
	EX4400-48T-AFI-TAA	
	EX4400-48T-DC	
	EX4400-48T-DC-AFI	
	EX4400-48T-DC-TAA	
	EX4400-48T-TAA	
	EX4400-48MP	
	EX4300-48MP-TAA	

Junos OS features to Flex License mapping on EX2300 series switches

On EX2300 switches, the following Junos OS features are supported by installing a Flex Standard and Advanced license.

Table 28 describes the licensing support for soft enforced features on EX2300 switches.

Table 28 Licensed Features on EX2300 switches

License Model	Use Case Examples or Solutions	Feature List
Standard	Campus and access Layer 2 or Layer 3	1. Layer 2 and Layer 3 filters 2. Layer 2 (*x*STP, 802.1Q, and LAG) 3. Layer 2 and Layer 3 QoS 4. Layer 3 (static) 5. IGMP snooping 6. Operation, Administration, and Maintenance (OAM) link fault management (LFM) 7. Q-in-Q 8. sFlow 9. SNMP 10. Junos telemetry interface (JTI) 11. Virtual Chassis*

License Model	Use Case Examples or Solutions	Feature List
Advanced	Campus and access Layer 2 or Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IGMP version 1, IGMP version 2, and IGMP version 3 3. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2, OSPF version 3, PIM multicast, VRRP version 3 4. Multicast Source Discovery protocol (MSDP) 5. OAM and Maintenance CFM 6. OSPF version 2 or OSPF version 3 7. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 8. Real-time performance monitoring (RPM) 9. RIP IPv6 (RIPng) 10. VRRP

Virtual Chassis*—We've included Virtual Chassis license in the Standard license model on EX2300-C 12-port switches. However, we don't include the Virtual Chassis license on EX2300 24-port and 48-port switch models. You need to purchase the license separately.

Junos OS features to Flex License mapping on EX3400 series switches

On EX3400 switches, the following Junos OS features are supported by installing a Flex Advanced and Premium license.

Table 29 describes the licensing support for soft enforced features on EX3400 switches.
Table 29 Licensed Features on EX3400 switches

License Model	Use Case Examples or Solutions	Feature List
Standard	Campus and access Layer 2 or Layer 3	1. Layer 2 and Layer 3 filters 2. Layer 2 (*x*STP, 802.1Q, and LAG) 3. Layer 2 and Layer 3 QoS 4. Layer 3 (static) 5. IGMP snooping 6. Operations, Administration, and Maintenance (OAM) link fault management (LFM) 7. Q-in-Q 8. sFlow 9. SNMP 10. Junos telemetry interface (JTI) 11. Virtual Chassis

License Model	Use Case Examples or Solutions	Feature List
Advanced	Campus and access Layer 2 or Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IGMP version 1, IGMP version 2, and IGMP version 3 3. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2, OSPF version 3, PIM multicast, VRRP version 3, and virtual router support for unicast 4. Filter-based forwarding (FBF) 5. Multicast Source Discovery protocol (MSDP) 6. OAM CFM 7. OSPF version 2 or OSPF version 3 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP

License Model	Use Case Examples or Solutions	Feature List
Premium	Campus and access Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IGMP version 1, IGMP version 2, and IGMP version 3 3. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2, OSPF version 3, PIM multicast, VRRPv3, and virtual router support for unicast 4. Filter-based forwarding (FBF) 5. Multicast Source Discovery Protocol (MSDP) 6. OAM CFM 7. OSPF version 2 or OSPF version 3 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP 14. BGP and multiprotocol BGP (MBGP) 15. IS-IS

Junos OS features to Flex License mapping on EX4100 and EX4100-F series switches

On EX4100 and EX4100-F switches, the following Junos OS features are supported by installing a Flex Advanced and Premium license.

Table 30 describes the licensing support for soft enforced features on EX4100 and EX4100-F switches.
Table 30 Licensed Features on EX4100 and EX4100-F switches

License Model	Use Case Examples or Solutions	Feature List
Standard	Campus and access Layer 2 or Layer 3	1. Layer 2 and Layer 3 filters 2. Layer 2 (*x*STP, 802.1Q, and LAG) 3. Layer 2 and Layer 3 QoS 4. Layer 3 (static) 5. IGMP snooping 6. Operations, Administration, and Maintenance (OAM) link fault management (LFM) 7. Q-in-Q 8. sFlow 9. SNMP 10. Junos telemetry interface (JTI) 11. Virtual Chassis

License Model	Use Case Examples or Solutions	Feature List
Advanced	Campus and access Layer 2 or Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IGMP version 1, IGMP version 2, and IGMP version 3 3. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2, OSPF version 3, PIM multicast, VRRP version 3, and virtual router support for unicast 4. Filter-based forwarding (FBF) 5. Multicast Source Discovery protocol (MSDP) 6. OAM CFM 7. OSPF version 2 or OSPF version 3 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP

License Model	Use Case Examples or Solutions	Feature List
Premium	Campus and access Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IGMP version 1, IGMP version 2, and IGMP version 3 3. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2, OSPF version 3, PIM multicast, VRRPv3, and virtual router support for unicast 4. Filter-based forwarding (FBF) 5. Multicast Source Discovery Protocol (MSDP) 6. OAM CFM 7. OSPF version 2 or OSPF version 3 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP 14. BGP and multiprotocol BGP (MBGP) 15. IS-IS

On EX4100 switch, the flow-based telemetry and MACsec features are hard-enforced. You'll need a license to use these features.

On EX4100-F switch, the flow-based telemetry is hard-enforced. You'll need a license to use this feature.

Junos OS features to Flex License mapping on EX4300 series switches

On EX4300 switches, the following Junos OS features are supported by installing a Flex Advanced and Premium license.

Table 31 describes the licensing support for soft enforced features on EX4300 switches.

Table 31 Licensed Features on EX4300 switches

License Model	Use Case Examples or Solutions	Feature List
Standard	Campus and access Layer 2 or Layer 3	1. Layer 2 and Layer 3 filters 2. Layer 2 (*x*STP, 802.1Q, and LAG) 3. Layer 2 and Layer 3 QoS 4. Layer 3 (static) 5. IGMP snooping 6. Operations, Administration, and Maintenance (OAM) link fault management (LFM) 7. Q-in-Q 8. sFlow 9. SNMP 10. Junos telemetry interface (JTI) 11. Virtual Chassis

License Model	Use Case Examples or Solutions	Feature List
Advanced	Campus and access Layer 2 or Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2 3. IGMP version 1, IGMP version 2, and IGMP version 3 4. Multicast Source Discovery protocol (MSDP) 5. OAM CFM 6. OSPF version 2 or OSPF version 3 7. FBF 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP

License Model	Use Case Examples or Solutions	Feature List

Premium	Campus and access Layer 3	1. Bidirectional Forwarding Detection (BFD)
		
		2. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2
		
		3. IGMP version 1, IGMP version 2, and IGMP version 3
		
		4. Multicast Source Discovery Protocol (MSDP)
		
		5. OAM CFM
		
		6. OSPF version 2 or OSPF version 3
		
		7. FBF
		
		8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode
		
		9. Real-time performance monitoring (RPM)
		
		10. RIP IPv6 (RIPng)
		
		11. Unicast reverse-path forwarding (unicast RPF)
		
		12. Virtual router
		
		13. VRRP
		
		14. BGP and multiprotocol BGP (MBGP)
		
		15. IS-IS
		
		16. EVPN-VXLAN
		    • Supported only on EX4300-48MP switch.
		    • Requires the BGP for configuration.

Junos OS features to Flex License mapping on EX4400 series switches

On EX4400 switches, the following Junos OS features are supported by installing a Flex Advanced and Premium license.

Table 32 describes the licensing support for soft enforced features on EX4400 switches.

Table 32 Licensed Features on EX4400 switches

License Model	Use Case Examples or Solutions	Feature List
Standard	Campus and access Layer 2 or Layer 3	1. Layer 2 and Layer 3 filters 2. Layer 2 (*x*STP, 802.1Q, and LAG) 3. Layer 2 and Layer 3 QoS 4. Layer 3 (static) 5. IGMP snooping 6. Operations, Administration, and Maintenance (OAM) link fault management (LFM) 7. Q-in-Q 8. sFlow 9. SNMP 10. Junos telemetry interface (JTI) 11. Virtual Chassis

License Model	Use Case Examples or Solutions	Feature List
Advanced	Campus and access Layer 2 or Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2 3. IGMP version 1, IGMP version 2, and IGMP version 3 4. Multicast Source Discovery protocol (MSDP) 5. OAM CFM 6. OSPF version 2 or OSPF version 3 7. FBF 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP

License Model	Use Case Examples or Solutions	Feature List
Premium	Campus and access Layer 3	1. Bidirectional Forwarding Detection (BFD) 2. IPv6 routing protocols: Multicast Listener Discovery (MLD) version 1 and MLD version 2 3. IGMP version 1, IGMP version 2, and IGMP version 3 4. Multicast Source Discovery Protocol (MSDP) 5. OAM CFM 6. OSPF version 2 or OSPF version 3 7. FBF 8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode 9. Real-time performance monitoring (RPM) 10. RIP IPv6 (RIPng) 11. Unicast reverse-path forwarding (unicast RPF) 12. Virtual router 13. VRRP 14. BGP and multiprotocol BGP (MBGP) 15. IS-IS 16. EVPN-VXLAN • Requires the BGP for configuration.

On EX4400 switch, the flow-based telemetry and MACsec features are hard-enforced. You'll need a license to use these features.

Flex Software License for QFX Series Switches

QFX Switches

QFX switch models that support the Software Subscription Model:

1. QFX5110-48S

2. QFX5110-32Q

3. QFX5110-48S

4. QFX5120-48Y

5. QFX5120-48YM

6. QFX5120-48T

7. QFX5120-32C

8. QFX5130-32CD

9. QFX5200-32C

10. QFX5210-64C

11. QFX5220-32CD

12. QFX5220-128C

13. QFX5700

14. QFX10002-36Q

15. QFX10002-60C

16. QFX10002-72Q

17. QFX10008

18. QFX10016

QFX5110-48S, QFX5110-32Q, QFX5200-32C, QFX5210-64C, and QFX5120-48Y support non-Flex Software License Models and Flex Software License Model. For example, the QFX5120-48Y supports QFX5120-48Y-AFO and QFX5120-48Y-AFO2, respectively.

To find supported features on each QFX device, see Feature Explorer.

Table 33 list the features supported on QFX Series switches.

Table 33 Supported Features on QFX5110-48S, QFX5110-32Q, QFX5120-48Y, QFX5120-48YM, QFX5120-48T, QFX5120-32C, QFX5130-32CD, QFX5200-32C, QFX5210-64C, QFX5220-32CD, QFX5220-128C, QFX5700, QFX10002-36Q, QFX10002-60C, QFX10002-72Q, QFX10008, and QFX10016 switches

QFX Switch License Model	Use Case Examples or Solutions	Detailed Features
Standard	Basic Layer 2 switching or basic Layer 3 forwarding	BFD, Filters (Layer 2 and Layer 3), Layer 2 (*x*STP, 802.1Q, LAG), Layer 3 (static), QoS (Layer 2 and Layer 3), MC-LAG, IGMP Snooping and SNMP
Advanced	**Advanced 1**:Data center fabric (IP Fabric) **Advanced 2**: Data center fabric (including EVPN /VXLAN)	**Advanced 1**: Standard features, BGP, IS-IS, ESI-LAG, FBF, VRRP, Layer 3 (static), GRE tunnel, OSPF, RIP, sFlow, and Virtual Chassis* **Advanced 2**: Advanced 1 features, CFM, Q-in-Q, VXLAN, PCEP, Timing, Ethernet OAM, EVPN-VXLAN, IGMP snooping version 1, IGMP snooping version 2, and IGMP snooping version 3, PIM, and Multicast Listener Discovery (MLD) version 1 or version 2
Premium	Connecting to WAN	Advanced 2 features, Layer 3 VPN, LDP, RSVP, Layer 2 circuit, EVPN-MPLS, Segment routing, and MPLS

Virtual Chassis*— The virtual chassis feature supported on QFX5120-48Y, QFX5120-32C, QFX5120-48T, and QFX5200 devices up to 2 members.

The MACsec feature supported only on QFX5120-48YM and QFX5700, you need separate license to use the MACsec feature on QFX5120-48YM and QFX5700 devices.

Starting in Junos OS Release 22.3R1, the MC-LAG feature moved to the standard tier.

Table 34 describes classification of QFX switch device class and SKUs.

Table 34 QFX switch device class and SKUs

QFX 5000 Series Product Class	QFX Device Models	SKUs
Class 1	QFX5110-32Q-AFO2 QFX5110-32Q-AFI2 QFX5110-32Q-D-AFO2 QFX5110-32Q-D-AFI2 QFX5110-48S-AFO2 QFX5110-48S-AFI2 QFX5110-48S-D-AFO2 QFX5110-48S-D-AFI2 QFX5110-48S-AFI-T2 QFX5110-48S-AFO-T2 QFX5120-48Y-AFO2 QFX5120-48Y-AFI2 QFX5120-48Y-D-AFO2 QFX5120-48Y-D-AFI2 QFX5120-48YM-AFO QFX5120-48YM-AFI QFX5120-48YM-DC-AO QFX5120-48YM-DC-AI QFX5120-48T-AFO QFX5120-48T-AFI QFX5120-48T-DC-AFO QFX5120-48T-DC-AFI	S-QFX5K-C1-A1-3 S-QFX5K-C1-A1-5 S-QFX5K-C1-A1-P S-QFX5K-C1-A2-3 S-QFX5K-C1-A2-5 S-QFX5K-C1-A2-P S-QFX5K-C1-P1-3 S-QFX5K-C1-P1-5 S-QFX5K-C1-P1-P S-QFX5KC1-MACSEC-3 S-QFX5KC1-MACSEC-5 S-QFX5KC1-MACSEC-P S-QFX5K-C1-IFA-1
Class 2	QFX5120-32C-AFO QFX5120-32C-AFI QFX5120-32C-AFI-T QFX5120-32C-AFO-T QFX5120-32C-DC-AFO QFX5120-32C-DC-AFI QFX5200-32C-AFO2 QFX5200-32C-AFI2 QFX5200-32C-D-AFO2 QFX5200-32C-D-AFI2 QFX5200-32C-AFO-T2 QFX5200-32C-AFI-T2	S-QFX5K-C2-A1-3 S-QFX5K-C2-A1-5 S-QFX5K-C2-A1-P S-QFX5K-C2-A2-3 S-QFX5K-C2-A2-5 S-QFX5K-C2-A2-P S-QFX5K-C2-P1-3 S-QFX5K-C2-P1-5 S-QFX5K-C2-P1-P S-QFX5K-C2-IFA-1

QFX 5000 Series Product Class	QFX Device Models	SKUs
Class 3	QFX5130-32CD-AFI QFX5130-32CD-AFO QFX5130-32CD-D-AFI QFX5130-32CD-D-AFO QFX5210-64C-AFO2 QFX5210-64C-AFI2 QFX5210-64C-D-AFO2 QFX5210-64C-D-AFI2 QFX5210-64C-AFO-T2 QFX5210-64C-AFI-T2 QFX5220-32CD-AFO QFX5220-32CD-AFI QFX5220-32CD-D-AFO QFX5220-32CD-D-AFI QFX5220-128C-AFO QFX5220-128C-D-AFO QFX5700-BASE-AC QFX5700-BASE-DC QFX5K-FPC-16C QFX5K-FPC-4CD QFX5K-FPC-20Y	S-QFX5K-C3-A1-3 S-QFX5K-C3-A1-5 S-QFX5K-C3-A1-P S-QFX5K-C3-A2-3 S-QFX5K-C3-A2-5 S-QFX5K-C3-A2-P S-QFX5K-C3-P1-3 S-QFX5K-C3-P1-5 S-QFX5K-C3-P1-P S-QFX5KC3-MACSEC-3 S-QFX5KC3-MACSEC-5 S-QFX5KC3-MACSEC-P
	QFX10002-36Q	S-QFX10K2-36Q-A2-3 S-QFX10K2-36Q-A2-5 S-QFX10K2-36Q-A2-P S-QFX10K2-36Q-P1-3 S-QFX10K2-36Q-P1-5 S-QFX10K2-36Q-P1-P
	QFX10002-60C	S-QFX10K2-60C-A2-3 S-QFX10K2-60C-A2-5 S-QFX10K2-60C-A2-P S-QFX10K2-60C-P1-3 S-QFX10K2-60C-P1-5 S-QFX10K2-60C-P1-P

QFX 5000 Series Product Class	QFX Device Models	SKUs
	QFX10002-72Q	S-QFX10K2-72Q-A2-3 S-QFX10K2-72Q-A2-5 S-QFX10K2-72Q-A2-P S-QFX10K2-72Q-P1-3 S-QFX10K2-72Q-P1-5 S-QFX10K2-72Q-P1-P
	QFX10008	S-QFX10K8-A2-3 S-QFX10K8-A2-5 S-QFX10K8-A2-P S-QFX10K8-P1-3 S-QFX10K8-P1-5 S-QFX10K8-P1-P
	QFX10016	S-QFX10K16-A2-3 S-QFX10K16-A2-5 S-QFX10K16-A2-P S-QFX10K16-P1-3 S-QFX10K16-P1-5 S-QFX10K16-P1-P

Flex Software License for Security Devices

Flex Software License for cSRX

Flex software license for cSRX is available as a subscription only. The subscription license includes the right-to-use (RTU) the licensed feature level and Juniper Technical Support for the term of the subscription.

Table 35 shows cSRX features for Flex Software License Model.

Table 35 cSRX Flex Software License Model

cSRX License Model	cSRX SKUs	Use Case Examples or Solutions	Detailed Features
Standard	S-CSRX-S-1 S-CSRX-S-3 S-CSRX-S-5	Use for standard firewall	Core security—firewall, ALG, screens, user firewall, NAT, Static routing, logging, management
Advanced	S-CSRX-A1-1 S-CSRX-A1-3 S-CSRX-A1-5	**Advanced 1** Use for data center security	**Advanced 1** Includes standard features + Application Security, and IPS
	S-CSRX-A2-1 S-CSRX-A2-3 S-CSRX-A2-5	**Advanced 2** Use for next-generation firewall with cloud based antivirus	**Advanced 2** Includes standard features + Application Security, cloud-based antivirus, IPS, and URL filtering

Flex Software License for JATP

JATP400, JATP700, and JATP Appliances

Table 36 describes the support for standard and advanced license models with use case examples for the JATP400, JATP700, and Juniper Networks® Advanced Threat Prevention Appliances (JATP Appliances).

Table 36 Supported Features on the JATP400, JATP700, and JATP Appliances

License Model	Use Case Examples or Solutions	Detailed Features	Bandwidth
Standard 1	JATP as an on-premises appliance with JATP Core and an SRX Series device as the collector	Malware analysis, SecIntel, Avira antivirus	1 Gbps 10 Gbps 100 Mbps 5 Gbps 500 Mbps
Standard 2	JATP as an on-premises appliance with JATP Core and an SRX Series device as the collector	Malware analysis, SecIntel, McAfee antivirus	
Advanced 1	JATP as an on-premises appliance with third-party integrations, JATP Core with an SRX Series, JATP collectors, analytics, and threat mitigation	Threat analytics and threat mitigation using third-party products, and all the features that are included in the standard 1 license	
Advanced 2	JATP as an on-premises appliance with third-party integrations, JATP Core with an SRX Series, JATP collectors, analytics, and threat mitigation	Threat analytics and threat mitigation using third-party products, and all the features that are included in the standard 2 license	

License stacking is allowed. You can combine individual or bundled licenses to combine features or to increase the total throughout that is supplied to the JATP Appliance. For example, you can combine a 5-Gbps license and another 5-Gbps license to supply 10-Gbps throughput to the JATP Appliance.

Flex Software License for SRX Series Devices

Flex Software Subscription Model is supported on SRX300, SRX320, SRX340, SRX345, SRX380, SRX550M, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, and SRX5800 devices.

1. SRX300 and SRX320 devices support **Advanced 1, Advanced 2** and **Premium 1** license.

2. SRX340, SRX345, and SRX380 devices support **Advanced 1, Advanced 2, Premium 1** and **Premium 2** license.

3. SRX550M device supports only **Advanced 1** license.

4. SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, and SRX5800 devices support **Advanced 1, Advanced 2, Advanced 3, Premium 1, Premium 2** and **Premium 3** license.

Table 37 shows SRX Series Services Gateways features for Flex Software Subscription Model.

Table 37 SRX Series Services Gateways Flex Software Subscription Model

SRX Series Services Gateways License Model	Use Case Examples or Solutions	Detailed Features
Standard	Use for basic firewall and secure branch routers	Includes hardware, plus Junos Base JSB (routing, firewall, switching, NAT, VPN, and MPLS)
Advanced	**Advanced 1** Use for data center security or SD-WAN	**Advanced 1** SecIntel, IDP, and Application Security*
	Advanced 2 Use for next-generation firewall with Cloud based antivirus and antispam	**Advanced 2** SecIntel, IDP, Application Security*, URL filtering, Cloud antivirus and antipsam
	Advanced 3 Use for next-generation firewall with On-box antivirus	**Advanced 3** SecIntel, IDP, Application Security*, URL filtering, On-box antivirus
Premium	**Premium 1** Use for data center security or SD-WAN or ATP Cloud with SecIntel	**Premium 1** Includes IDP, Application Security*, and ATP Cloud

SRX Series Services Gateways License Model	Use Case Examples or Solutions	Detailed Features
	Premium 2 Use for next-generation firewall or ATP Cloud with SecIntel	**Premium 2** Includes IDP, Application Security*, URL filtering, Cloud antivirus and antispam, and ATP Cloud
	Premium 3 Use for next-generation firewall or ATP Cloud with SecIntel	**Premium 3** Includes IDP, Application Security*, URL filtering, On-box antivirus, and ATP Cloud

*Application Security includes application visibility and control through unified policy for next-gen firewall capabilities as well as enables SD-WAN capabilities with Advanced policy-based routing (APBR) and Application Quality of Experience (AppQoE).

SD-WAN Flex Software Subscription license includes features supported in Junos OS.

Flex Software License for vSRX

Flex software license for vSRX is available as a subscription only. The subscription license includes the right-to-use (RTU) the licensed feature level and Juniper Technical Support for the term of the subscription.

1. vSRX is available with a 60 days built-in trial eval license that expires after 60 days.

2. OCI supports Bring Your Own License (BYOL) licensing model. The BYOL license model allows you to customize your license, subscription and support to fit your needs. You can purchase BYOL from Juniper Networks or Juniper Networks authorized reseller.

3. To add, delete, and manage licenses, see Managing Licenses.

Table 38 shows vSRX features for Flex Software License Model.

Table 38 Licensed Features on vSRX

vSRX License Model	Use Case Examples or Solutions	Number of vCPUs Required	Feature List
Standard	Use for standard firewall and secure branch routers	2, 5, 9, 17, or 32 virtual CPUs (vCPUs)	Application Layer Gateways (ALGs), BGP, class of service (CoS), DHCP, diagnostics, firewall, GRE, IP tunneling, IPv4 and IPv6, J-Flow, management (J-Web, CLI, and NETCONF), MPLS, multicast, NAT, on-box logging, OSPF, screens, site-to-site VPN, static routing, and user firewall
Advanced	Advanced 1 Use for data center security	2, 5, 9, 17, or 32 vCPUs	Includes Standard features plus IPS and application security (application identification, application firewall, application quality of service, and application tracking)

vSRX License Model	Use Case Examples or Solutions	Number of vCPUs Required	Feature List
	Advanced 2 Use for next-generation firewall with cloud-based antivirus	2, 5, 9, 17, or 32 vCPUs	Includes Standard and Advanced 1 features, Sophos antivirus, Web filtering, antispam, and content filtering
	Advanced 3 Use for next-generation firewall with on-box antivirus	2, 5, 9, 17, or 32 vCPUs	Includes Standard and Advanced 1 features, Avira antivirus, Web filtering, antispam, and content filtering
Premium	Premium 1 Use for data center security and Juniper Advanced Threat Prevention Cloud (Juniper ATP Cloud)	2, 5, 9, 17, or 32 vCPUs	Includes Standard and Advanced 1 features, and Juniper ATP Cloud
	Premium 2 Use for next-generation firewall and Juniper ATP Cloud	2, 5, 9, 17, or 32 vCPUs	Includes Standard and Advanced 2 features, and Juniper ATP Cloud
	Premium 3 Use for next-generation firewall and Juniper ATP Cloud	2,5,9, 17, or 32 vCPUs	Includes Standard and Advanced 3 features, and Juniper ATP Cloud

Note: Advanced 3 and Premium 3 licenses are supported only on vSRX3.0.

vSRX Flex Software License Model supports standard, advanced, or premium subscription license. Subscription term is 1 year, 3 years, or 5 years and includes customer support.

For public cloud, vSRX Flex Software License Model supports—Pay-As-You-Go (PAYG) and Bring Your Own License (BYOL) license model. Pricing is based on number of vCPU cores, with a minimum of 2 vCPU cores.

Table 39 shows vSRX SKU definition.

Table 39 vSRX SKU Definition

SKU	SKU Character Description
S-VSRX-*2C/5C/9C/17C-S/A1/A2/A3/P1/P2/P3-1/3/5* **Example**: 1. S-VSRX-2C-S-1 2. S-VSRX-5C-S-3 3. S-VSRX-9C-S-5 4. S-VSRX-5C-A1-1 5. S-VSRX-17C-A2-3 6. S-VSRX-17C-A3-5 7. S-VSRX-5C-P1-1 8. S-VSRX-17C-P2-3 9. S-VSRX-17C-P3-5	**S**—Software **VSRX**—Product name vSRX **2C/5C/9C/17C**—Number of vCPUs **S/A1/A2/A3/P1/P2/P3** 1. **S** = Standard license model 2. **A1** = Advanced 1 license model 3. **A2** = Advanced 2 license model 4. **A3** = Advanced 3 license model 5. **P1** = Premium 1 license model 6. **P2** = Premium 2 license model 7. **P3** = Premium 3 license model **1/3/5**—Subscription term 1, 3, or 5 years

Flex Software License for Network Management and Operations

Flex Software License for Contrail

Contrail Service Orchestration

Table 40 describes the standard and advance license model support with use case examples for the Contrail Service Orchestration (CSO) software. Table 40 lists the supported devices categorized into device classes.

Table 40 describes the Flex Software License Model support with use case examples for the Contrail Service Orchestration (CSO) software.

Table 40 CSO SKUs for Standard and Advanced License Model

License Model	Use Case Examples or Solutions	Features Supported
Standard	Hybrid WAN, next-generation firewall management, and SD-LAN	**A,B, and C class devices supports the following features**: Authentication for VPNs, firewall, hybrid WAN-dual WAN links (active/backup), NAT, security event logs and reporting, single-WAN link-managed CPE, user firewall, UTM, and zero-touch provisioning (ZTP) for CPE devices. **D and E class devices supports the following features**: Automated switch deployment through ZTP, LAN configuration and monitoring, Mist Wi-Fi integration, switch management, and virtual chassis (VC). For more information on device categories, see Table 42 on page **Error! Bookmark not defined.**.

License Model	Use Case Examples or Solutions	Features Supported
Advanced	Hybrid WAN, next-generation firewall management, and SD-WAN	**A,B, and C class devices supports the following features**: APBR, AppQoE, Authentication for VPNs, AWS cloud endpoint, bandwidth-optimized SLA (RPM), dual CPE, firewall, full mesh or dynamic VPN, hub multihoming, hybrid WAN-dual WAN links (active/backup), Internet Zscaler breakout, NAT, network segmentation, real-time-optimized SLA (AppQoE), SD-WAN up to four WAN links (active/active), security event logs and reporting, single-WAN link-managed CPE, SLA-based dynamic path selection, user firewall, UTM, and zero-touch provisioning (ZTP) for CPE devices For more information on device categories, see Table 42 on page **Error! Bookmark not defined.**.

CSO supports various Juniper Networks devices. Table 41 lists the supported devices categorized into device classes.

Table 41 CSO supported Device Classification

Device Class	Supported Devices	
A	**SD-WAN Supported Devices**	**Next-Generation Firewall**
	CPE/Spoke (<250) SRX300 line of devices with Junos Software Enhanced (JSE) NFX150 vSRX (2 vCPUs)	**Next-Generation Firewall Devices** Next-Generation Firewall servies with Junos Software Enhanced (JSE) SRX300 line of devices vSRX (2 vCPUs)

Device Class	Supported Devices	
B	**CPE/Spoke (<1Gbps)** NFX250 SRX550 with Junos Software Enhanced (JSE) vSRX (5 vCPUs) **Enterprise Hub Devices (Gateway) (<1Gbps)** SRX1500 (CSO release 5.0x onwards) Services gateways with Junos Software Enhanced (JSE) **Cloud Hub Devices (<1Gbps)** SRX1500 Services gateways with Junos Software Enhanced (JSE)	**Next-Generation Firewall Devices** Next-Generation Firewall servies with Junos Software Enhanced (JSE) vSRX (5 vCPUs)
C	**Enterprise Hub Devices (Gateway) (>1Gbps)** SRX4100 and SRX4200 Services gateways with Junos Software Enhanced (JSE) **Cloud Hub Devices (>1Gbps)** Services gateways with Junos Software Enhanced (JSE) SRX4100 and SRX4200 vSRX (7 or 19 vCPUs)	**Next-Generation Firewall Devices** Next-Generation Firewall servies with Junos Software Enhanced (JSE) vSRX (7 or 19 vCPUs)
D	Class D does not support any SD-WAN devices	**SD-LAN Devices** EX2300, EX3400, and EX4300 switches
E	Class E does not support any SD-WAN devices	**SD-LAN Devices** EX4600 and EX4650 switches

Flex Software License for Apstra

You can see the detailed list of features supported on Juniper Apstra at Juniper Apstra Datasheet.

Table 42 describes the licensing support with use case examples for the Juniper Apstra.

Table 42 Supported Features on Juniper Apstra

License Model	Use Case Examples or Solutions	Detailed Features	SKUs
Standard	Basic configuration and operations	1. 1 blueprint per instance 2. Basic Telemetry or Intent Based Analytics (IBA) 3. 3 or 5 stage IP Clos fabric 4. Collapsed fabric 5. Device management 6. Platform management	S-APSTRA-S-1/3/5
Advanced	Full operation, assurance, and intent-based analytics	1. All Standard features 2. Up to 3 blueprints per instance 3. Advanced Intent Based Analytics (IBA) 4. Apstra telemetry streaming 5. Root cause identification and analysis (RCI/RCA) 6. Data Center Interconnect (over-the-top (OTT) Data Center Interconnect (DCI))	S-APSTRA-A-1/3/5

License Model	Use Case Examples or Solutions	Detailed Features	SKUs
Premium	Large scale, multi-vendor and policy control	1. All Advanced features 2. More than 3 blueprints 3. Third party vendor fabrics* 4. Policy assurance	S-APSTRA-P-1 /3/5

1. *Third party vendor fabrics—Fabrics with non-juniper devices requires Premium license.

2. The Standard license includes six months of Advanced trial license with Standard license purchase.

You need additional licenses to use the connector for VMware on Juniper Apstra for integrations with VMware vCenter and NSX-T. Refer to unique_20_Connect_42_vmware the Table 43 for licensing options for the Connector for VMware.

Table 43 Juniper Apstra Connector for VMware

License Model	Detailed Features	SKUs
Standard	1. 50 server hosts per license pack 2. VMware vCenter 3. VMware NSX-T	S-APSTRA-VM-S-1/3/5

Table 44 describes Juniper Apstra SKU definitions.

Table 44 Juniper Apstra SKU Definition

SKU	SKU Character Description
S-APSTRA-VM-S-1/3/5	S—Software APSTRA—Product name VM—VMware S—Standard 1/3/5—Subscription term 1, 3, or 5 years
S-APSTRA-S/A/P-1 /3/5	S—Software APSTRA—Product name S—Standard A—Advanced P—Premium 1/3/5—Subscription term 1, 3, or 5 years

Flex Software License for Paragon Insights

Paragon Insights Licensing Overview

Juniper Networks introduced the Juniper Flex Software Subscription Licensing model to provide an efficient way for you to manage licenses for hardware and software features. Paragon Insights uses this licensing model.

To use a licensed feature, you need to purchase and activate a license that corresponds to that feature and deploy that license so that it can be utilized by the software during normal operation. You can administer and manage the licenses through the Juniper Agile Licensing Portal. The portal provides an intuitive, task-based user interface that provides full lifecycle management of licenses.

Paragon Insights supports the standalone mode for deploying licenses. Standalone mode allows you to activate a license on a software instance. Such a license can be used only by the instance on which it is activated. You cannot share a license with multiple instances.

Table 45 shows a comparison between the Paragon Insights service models:

Table 45 Paragon Insights License SKUs and Use Case Example

	Paragon Insights Standard	Paragon Insights Advanced	Paragon Insights Lab
License SKUs	S-PIN-S1-1 / -3 / -5 S-PIN-100-S1-C1-1 / -3 / -5 S-PIN-10-S1-C1-1 / -3 / -5 S-PIN-10-S1-C2-1 / -3 / -5 S-PIN-1-S1-C3-1 / -3 / -5 S-PIN-1-S1-C4-1 / -3 / -5	S-PIN-A1-1 / -3 / -5 S-PIN-100-A1-C1-1 / -3 / -5 S-PIN-10-A1-C1-1 / -3 / -5 S-PIN-10-A1-C2-1 / -3 / -5 S-PIN-1-A1-C3-1 / -3 / -5 S-PIN-1-A1-C4-1 / -3 / -5	S-PIN-NONPROD-BB-1 / -3 / -5
Use Case Example or Solution	Access to standard features. You must purchase a Paragon Insights Standard software license and device licenses for the size of your network.	Access to advanced features. You must purchase a Paragon Insights Advanced software license and device licenses for the size of your network.	Non-production use only Access to all features of all tiers for Paragon Insights, Paragon Planner and Paragon Pathfinder. Bundle also includes access to 50 device licenses.

Table 46 Paragon Insights Features

Detailed Features	Paragon Insights Standard	Paragon Insights Advanced	Paragon Insights Lab
Application high availability and elastic scale	✓	✓	✓
External Kafka data publishing	✓	✓	✓
Full support for generating notifications.	✗	✓	✓
Full support for generating reports.	✗	✓	✓
GUI and API data access	✓	✓	✓
Multivendor telemetry data collection.	✓	✓	✓
Number of devices allowed is based on the device licenses purchased.	✓	✓	✓
Subscription licenses with included support	✓	✓	✓
Support for unlimited standard default and custom rules	✓	✓	✓
Support for default and custom rules with user-defined functions.	✗	✓	✓
Support for default and custom rules with machine learning features such as dynamic thresholds, outlier detection, median prediction, and micro burst.	✗	✓	✓

Detailed Features	Paragon Insights Standard	Paragon Insights Advanced	Paragon Insights Lab
Time Inspector for advanced troubleshooting	✗	✓	✓
Time Series Database (TSDB) data redundancy	✗	✓	✓
Unlimited custom playbooks	✓	✓	✓

*For information about Paragon Insights product options or to obtain a trial license, contact your local sales representative.

The following is a list of available licenses for Paragon Insights devices:

Table 47 Paragon Insights Devices

Device Feature Name	Description
C1	Extra small devices such as small remote CPEs, small branch SRX Series and small ACX Series
C2	Small switches such as fixed form factor EX Series, ACX Series, and QFX Series
C3	Small chassis-based switches, routers, and firewalls such as MX10003 router and PTX10K3 router
C4	Large chassis-based systems like the MX10000 router, PTX Series, and large SRX Series

Enforcement of device license counts is based on the total number of all C1-C4 licenses installed minus the total number of licenses actually used. This enforcement model might change in future releases of Paragon Automation.

Note: In HealthBot releases prior to 3.1.0, the feature licenses were called HBOT-BASE, HBOT-G1, and HBOT-G2. License purchases made in previous versions will be honored in HealthBot 3.1.0. New license purchases as of 3.1.0 cannot be applied to previous versions of HealthBot. HealthBot licenses made as of 3.1.0 can be applied to any version of Paragon Insights. See your local account manager for details.

Managing Paragon Insights Licenses

Once you have obtained a HealthBot license through the Juniper Agile Licensing Portal, you can:
Add a License to Paragon Insights

To add a Paragon Insights license:

1. Click on the **Settings > License Management** option in the left-nav bar.

2. Click the **+ License** button.

3. Click the **Choose File** button in the pop-up window.

4. Navigate to the license file you want to add, and then click **Open**.

5. Click the **Add** button to add the license file.

   The file should now appear in the **Licenses Added** table on the License Management page. For information about the **Licenses Added** table, see "Licenses Added" on page 83.

View Licensing Status in Paragon Insights

The License Management page consists of two tables; the Features Summary table and the Licenses added table. Details of the table contents are shown below.

Features Summary

Table 48 describes the Paragon Insights feature license attributes in the Features Summary table:

Table 48 Paragon Insights Feature License Attributes

Attribute	Description
Feature	Paragon Insights license name.
	PIN-Premium Limit and usage count for premium feature licenses for this instance of Paragon Insights
	PIN-Advanced Limit and usage count for advanced feature licenses for this instance of Paragon Insights
	PIN-Standard Limit and usage count for standard feature licenses for this instance of Paragon Insights
	PIN-Devices Maximum number of devices that can be managed by this instance of Paragon Insights based on the device feature licenses added.
Description	Brief description of the Paragon Insights feature license.
License Limit	The number of valid Paragon Insights licenses successfully added and available for use.
Usage Count	The number of available licenses that are currently in use in this instance of Paragon Insights.
Valid Until	Date and time when the license expires.
Compliance	Color definitions for dot indicator:
	Green Feature licenses are in compliance with Juniper's End User License Agreement.
	Yellow Device feature licenses are >= 90% of the limit. You are getting close to running out of licenses. This status is only applicable to device feature licenses.
	Red Feature licenses are not in compliance with Juniper's End User License Agreement. Click on the red dot to view details about the compliance issue.

Licenses Added

Table 49 describes the Paragon Insights license attributes in the **Licenses Added** table. Click the caret next to the **License ID** to view the features that are provided by the license ID.

Table 49 Paragon Insights License Attributes

Attribute	Description
License ID	Identification number for the Paragon Insights license generated through the Juniper Agile Licensing Portal.
SKU Name	Name of the Paragon Insights software licensing package.
Customer ID	Identification name for the customer.
Order Type	Types include: Commercial, demo, education, emergency, lab, and unknown.
Validity Type	Types include: Date-based or permanent.
Start Date	Start date of the Paragon Insights license.
End Date	End date of the Paragon Insights license.
Feature ID	Identification number for the feature license.
Feature Name	Paragon Insights feature license name. For more information, see "Features Summary" on page 82.
Feature Description	Brief description of the Paragon Insights feature license.

Attribute	Description	
License Count	**PIN-Premium**	Allow premium capabilities in Paragon Insights
	PIN-Advanced	Allow advanced capabilities in Paragon Insights
	PIN-C1	Number of C1 devices that can be managed by Paragon Insights.
	PIN-C2	Number of C2 devices that can be managed by Paragon Insights.
	PIN-C3	Number of C3 devices that can be managed by Paragon Insights.
	PIN-C4	Number of C4 devices that can be managed by Paragon Insights.
State	The status indicates if the license is valid or not.	

Release History Table

Release	Description
3.1.0	For the HealthBot 3.1.0 release, enforcement of device license counts is based on the total number of all C1-C4 licenses installed minus the total number of licenses actually used.

Flex Software License for NFX

Table 50 shows NFX350 features for Flex Software License Model.

Table 50 NFX350 Flex Software License Model

NFX350 License Model	Use Case Examples or Solutions	Detailed Features
Standard	Use for basic firewall and secure branch routers	Includes hardware, plus Junos Base JSB (routing, firewall, switching, NAT, VPN, and MPLS)
Advanced	**Advanced 1** Use for data center security + SD-WAN	**Advanced 1** Includes IPS and Application Security
	Advanced 2 Use for next-generation firewall with Sophos	**Advanced 2** Includes IPS, Application Security, URL filtering, Sophos antivirus and antipsam
	Advanced 3 Use for next-generation firewall with Avira	**Advanced 3** Includes IPS, Application Security, URL filtering, On-box antivirus
Premium	**Premium 1** Use for data center security or SD-WAN + Cloud ATP	**Premium 1** Includes IPS, Application Security, and ATP Cloud
	Premium 2 Use for next-generation firewall + Cloud ATP	**Premium 2** Includes IPS, Application Security, URL filtering, Sophos antivirus and antispam, and ATP Cloud
	Premium 3 Use for data center security or SD-WAN + Cloud ATP	**Premium 3** Includes IPS, Application Security, URL filtering, On-box antivirus, and ATP Cloud

Flex Software License for Northstar Controller

Table 51 shows the definition of Juniper Networks NorthStar Controller license SKUs.

Table 51 NorthStar Controller SKU Definition

License SKU	SKU Character Description
S-NSC-1/10/100-S1/A1/P1-C1/C2/C3/C4-1/3/5	**S**—Software **NSC**—Product name: NorthStar Controller **1/10/100**—License metrics for 1, 10, or 100 devices **S1/A1/P1**—Standard 1, Advanced 1, or Premium 1 software subscription **C1/C2/C3/C4**—Device class **1/3/5**—Subscription term: 1 year, 3 years, or 5 years

Table 52 describes the licensing support with use case examples for the NorthStar Controller.

Table 52 Supported Features on the NorthStar Controller

License Model	License SKUs	Use Case Example or Solution	Detailed Features
Standard	S-NSC-100-S1-C1-1/3/5 S-NSC-10-S1-C2-1/3/5 S-NSC-1-S1-C3-1/3/5 S-NSC-1-S1-C4-1/3/5	Network visualization and monitoring	1. Collection using Healthbot 2. cRPD support 3. Delay visualization 4. Demand visualization (LDP FEC and flow based) 5. Dynamic topology acquisition 6. Flow collection 7. Interface statistics visualization 8. JTI telemetry collection 9. LSP reporting, statistics visualization (RSVP and SR) 10. P2MP LSP visualization 11. SNMP based collection 12. Topology visualization

License Model	License SKUs	Use Case Example or Solution	Detailed Features
Advanced	S-NSC-100-A1-C1-1/3/5 S-NSC-10-A1-C2-1/3/5 S-NSC-1-A1-C3-1/3/5 S-NSC-1-A1-C4-1/3/5	LSP provisioning	1. All Standard features 2. Auto-bandwidth LSPs (NorthStar managed) 3. Diverse LSPs 4. High availability 5. LSP optimization (bandwidth and delay) 6. LSP provisoining (RSVP and SR) 7. LSP templates 8. Maintenance events 9. P2MP LSP provisioning 10. Standby and secondary LSPs 11. Symmetric pair groups 12. TE++ LSPs 13. Time-based LSP scheduling
Premium	S-NSC-100-P1-C1-1/3/5 S-NSC-10-P1-C2-1/3/5 S-NSC-1-P1-C3-1/3/5 S-NSC-1-P1-C4-1/3/5	Advanced transport engineering	1. All Advanced features 2. Egress peering engineering 3. Ingress peering engineering 4. Multilayer packet-optical support 5. Network slicing management

Flex Software License for Northstar Planner

Table 53 shows the definition of Juniper Networks NorthStar Planner license SKUs.

Table 53 NorthStar Planner SKU Definition

License SKU	SKU Character Description
S-NSP-1/10/100-S1/A1-C1/C2/C3/C4-1/3/5	**S**—Software **NSP**—Product name: NorthStar Planner **1/10/100**—License metrics for 1, 10, or 100 devices **S1/A1**—Standard 1, or Advanced 1 software subscription **C1/C2/C3/C4**—Device class **1/3/5**—Subscription term: 1 year, 3 years, or 5 years

Table 54 describes the licensing support with use case examples for the NorthStar Planner.

Table 54 Supported Features on the NorthStar Planner

License Model	License SKUs	Use Case Example or Solution	Detailed Features
Standard	S-NSP-100-S1-C1-1/3/5 S-NSP-10-S1-C2-1/3/5 S-NSP-1-S1-C3-1/3/5 S-NSP-1-S1-C4-1/3/5	Basic network planning	1. BGP analysis 2. Capacity planning 3. CoS analysis and planning 4. Data collection from Northstar Controller 5. Detailed reporting 6. ECMP analysis 7. Failure simulation 8. File based data insertion (configuration, operational, tunnels, delays, and demmands) 9. Path assignments 10. Policy based routes 11. Routing protocols 12. Static routes

License Model	License SKUs	Use Case Example or Solution	Detailed Features
Advanced	S-NSP-100-A1-C1-1/3/5 S-NSP-10-A1-C2-1/3/5 S-NSP-1-A1-C3-1/3/5 S-NSP-1-A1-C4-1/3/5	Advanced capacity planning	1. All Standard features 2. Compliancy assessment 3. Cost based design 4. Fast reroute planning 5. GRE tunnels 6. Hardware inventory and reports 7. Integrity check and reports 8. Multicast planning 9. Network slicing planning 10. P2MP planning 11. Traffi matrix solver 12. VPN analysis and planning

Table 55 lists the avasilable NorthStar Controller and NorthStar Planner device classification.

Table 55 Classification of Devices Supported by the NorthStar Controller and NorthStar Planner

Device Name	Description	Supported Devices
C1	Extra-small devices such as mobile backhaul access devices, and small or remote CPE devices	ACX500, ACX710, ACX1000, ACX1100, ACX2100, ACX2200, cSRX, EX2300, and SRX300
C2	Small devices such as compact, fixed-form-factor switches, metro access switches, and top-of-rack switches	ACX4000, ACX5048, ACX5096, ACX5448, ACX6160, ACX6360, EX4300, EX4600, EX4650, EX9250, MX5, MX10, MX40, MX80, MX104, MX150, MX204, vMX, PTX1000, PTX10001, QFX5110, QFX5120, QFX5200, QFX5210, QFX5220, QFX10002, SRX550, SRX1500, SRX4100, SRX4200, and vSRX

Device Name	Description	Supported Devices
C3	Small chassis-based switches, routers, and firewalls (chassis with less than or equal to six slots)	EX9204, M Series, MX Series GNFs, MX240, MX480, MX10003, PTX10002, PTX10003, SRX3400, SRX3600, SRX4600, and SRX5400
C4	Large chassis-based systems (chassis with more than six slots)	EX9208, EX9214, MX960, MX2008, MX2010, MX2020, MX10008, MX10016, PTX3000, PTX5000, PTX10008, PTX10016, QFX10008, QFX10016, SRX5600, SRX5800, and T Series

Flex Software License for Paragon Automation as a Service

This Licensing model is for Paragon Automation's cloud-delivered SaaS offering. These are capacity-based licenses, and the Standard package includes 6 SKU options: 3 each for 100G and 400G capacities respectively, with 1, 3 and 5 Year terms. Each License SKU is linked to features related to device onboarding, observability and network trust.

The following table describes the licensing details of the Paragon Automation as a Service SKUs:

License Model	License SKUs	Use Case Example or Solution	Detailed Features
Standard	S-PA-AS-100-S-1/3/5 S-PA-AS-400-S-1/3/5	• Device Onboarding • Observability • Network Trust	The Standard License includes features related 3 Use Cases: 1. Automatic, guided onboarding of devices onto the network 2. Visualization of network health and performance 3. Features related to trust and compliance

2

Non-Flex Software Licenses Model

Overview

Software License Overview

Junos OS Feature Licenses

Some Junos OS software features require a license to activate the feature. To enable a licensed feature, you need to purchase, install, manage, and verify a license key that corresponds to each licensed feature. To conform to Junos OS feature licensing requirements, you must purchase one license per feature per device. The presence of the appropriate software license key on your device determines whether you are eligible to configure and use the licensed feature.

To speed deployment of licensed features, Junos OS software implements an honor-based licensing structure and provides you with a 30-day grace period to use a licensed feature without a license key installed. The grace period begins when you configure the feature and your device uses the licensed feature for the first time, but not necessarily when you install the license. After the grace period expires, the system generates system log messages saying that the feature requires a license. To clear the error message and use the licensed feature properly, you must install and verify the required license.

Data center customers, for example those using the QFX platform, use universal licenses. Starting in Junos OS Release 15.1, to ensure that license keys are used properly, Juniper Networks license key generation is enhanced to specify a customer ID in the license key. You can see the customer ID displayed in the output of the `show system license` command.

For information about how to purchase software licenses, contact your Juniper Networks sales representative.

License Enforcement

For features or scaling levels that require a license, you must install and properly configure the license to meet the requirements for using the licensable feature or scale level. The device enables you to commit a configuration that specifies a licensable feature or scale without a license for a 30-day grace period. The grace period is a short-term grant that enables you to start using features in the pack or scale up to the system limits (regardless of the license key limit) without a license key installed. The grace period begins when the licensable feature or scaling level is actually used by the device (not when it is first committed). In other words, you can commit licensable features or scaling limits to the device configuration, but the grace period does not begin until the device uses the licensable feature or exceeds a licensable scaling level.

Configurations might include both licensed and nonlicensed features. For these situations, the license is enforced up to the point where the license can be clearly distinguished. For example, an authentication-order configuration is shared by both Authentication, Authorization, and Accounting (AAA), which is licensed, and by Layer 2 Tunneling Protocol (L2TP), which is not licensed. When the configuration is committed, the device does not issue any license warnings, because it is not yet known whether AAA or

L2TP is using the configuration. However, at runtime, the device checks for a license when AAA authenticates clients, but does not check when L2TP authenticates clients.

The device reports any license breach as a warning log message whenever a configuration is committed that contains a feature or scale limit usage that requires a license. Following the 30-day grace period, the device periodically reports the breach to syslog messages until a license is installed and properly configured on the device to resolve the breach.

Successful commitment of a licensable feature or scaling configuration does not imply that the required licenses are installed or not required. If a required license is not present, the system issues a warning message after it commits the configuration.

Junos OS Feature License Keys

This section contains the following topics:
License Key Components

A license key consists of two parts:

1. License ID—Alphanumeric string that uniquely identifies the license key. When a license is generated, it is given a license ID.

2. License data—Block of binary data that defines and stores all license key objects.

For example, in the following typical license key, the string XXXXXXXXXX is the license ID, and the trailing block of data is the license data:

```
XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx xxx
```

The license data defines the device ID for which the license is valid and the version of the license.
License Management Fields Summary

The Licenses page displays a summary of licensed features that are configured on the device and a list of licenses that are installed on the device. The information on the license management page is summarized in Table 56.

Table 56 Summary of License Management Fields

Field Name	Definition
Feature Summary	
Feature	Name of the licensed feature: 1. `Features`—Software feature licenses. 2. `All features`—All-inclusive licenses
Licenses Used	Number of licenses currently being used on the device. Usage is determined by the configuration on the device. If a feature license exists and that feature is configured, the license is considered used.
Licenses Installed	Number of licenses installed on the device for the particular feature.
Licenses Needed	Number of licenses required for legal use of the feature. Usage is determined by the configuration on the device: If a feature is configured and the license for that feature is not installed, a single license is needed.
Installed Licenses	
ID	Unique alphanumeric ID of the license.
State	`Valid`—The installed license key is valid. `Invalid`—The installed license key is not valid.
Version	Numeric version number of the license key.
Group	If the license defines a group license, this field displays the group definition. If the license requires a group license, this field displays the required group definition. Because group licenses are currently unsupported, this field is always blank.
Enabled Features	Name of the feature that is enabled with the particular license.
Expiry	Verify that the expiration information for the license is correct. For Junos OS, only permanent licenses are supported. If a license has expired, it is shown as invalid.

To speed deployment of licensed features, Juniper Networks implements an honor-based licensing structure and provides you with a 30-day grace period to use a licensed feature without a license key installed. The grace period begins when you configure the feature and your device uses the licensed

feature for the first time, but not necessarily when you install the license. After the grace period expires, the system generates system log messages saying that the feature requires a license. To clear the error message and use the licensed feature properly, you must install and verify the required license.

Data center customers, for example those using the QFX platform, use universal licenses. Starting in Junos OS Release 15.1, to ensure that license keys are used properly, Juniper Networks license key generation is enhanced to specify a customer ID in the license key. You can see the customer ID displayed in the output of the show system license command.

Release-Tied License Keys and Upgrade Licenses on MX Series Routers

The Junos OS licensing infrastructure currently associates a license feature with attributes such as date, platform, and validity. In addition to these attributes, for MX Series routers running Junos OS Release 12.2 and later, a licensed feature can be associated with a release number at the time of generating the license key. This type of release-tied license key is used to validate a particular licensed feature while attempting a software upgrade. The upgrade process terminates if the release number in the license key is earlier than the Junos OS release number to which the system is being upgraded.

Additionally, an upgrade license key can be generated for a release-tied licensed feature. An upgrade license key is used for carrying forward a capacity license to the upgrade release. Although an upgrade license might be an acceptable license on the current release, it does not add to the existing capacity limit. The capacity added in the upgrade license key is valid for the upgrade software release only.

The release number embedded in the license key indicates the maximum release number up to which Junos OS can be upgraded.

As an example, assume that your system is running Junos OS Release 12.2 and is using the `scale-subscriber` licensed feature with a later release-tied upgrade license key installed. If you request a software upgrade to the later release of Junos OS, the software upgrade operation fails and the following error message is displayed:

```
mgd: error: No valid upgrade license found for feature 'scale-subscriber'.
Aborting Software upgrade.
Validation failed
```

In this example, to successfully upgrade to the later release of Junos OS, the release number included in the upgrade license key should be greater than or equal to the later release number. Also, you can perform software upgrades up to the previous release without any additional license keys to retain the existing scale limit.

When you install a release-tied license, the following apply:

1. You can purchase an upgrade capacity license only if a base capacity license for the same scale-tier has already been generated or purchased.

2. You cannot install an upgrade license if the capacity does not match any of the existing base capacity licenses on the system.

3. The license installation fails when you install a lower release number license key on a higher software release number.

4. A release-tied license can be installed on a Junos OS release number that is lower than or equal to the release number included in the license key. For example, a 12.2 license key is valid on Junos OS Release 12.1.

5. An upgrade license is valid only on the target release number specified in the license key, but can be installed on an earlier Junos OS release. For example, a 4 K scale-tier upgrade license for Junos OS Release 12.2 can be installed on an earlier release, and the installed count of licenses remains unaltered.

6. Release-tied licenses of the previous release are not deleted on upgrading Junos OS to a newer release version.

Licensable Ports on MX5, MX10, and MX40 Routers

Starting with Junos OS Release 12.2, license keys are available to enhance the port capacity on MX5, MX10, and MX40 routers up to the port capacity of an MX80 router. The MX5, MX10, and MX40 routers are derived from the modular MX80 chassis with similar slot and port assignments, and provide all functionality available on an MX80 router, but at a lower capacity. Restricting port capacity is achieved by making a set of MIC slots and ports licensable. MICs without a license are locked, and are unlocked or made usable by installing appropriate upgrade licenses.

The base capacity of a router is identified by the Ideeprom assembly ID (I2C ID), which defines the board type. However, the Junos OS licensing infrastructure allows the use of restricted ports without a license for a grace period of 30 days. After the grace period expires, the router reverts back to the base capacity if no upgrade license is purchased and installed for the locked ports. The I2C ID along with an upgrade license determine the final capacity of an MX5, MX10, or MX40 router.

The MX5, MX10, MX40, and MX80 routers support the following types of MICs:

1. A built-in 10-Gigabit Ethernet MIC with four 10-Gigabit Ethernet ports

2. Two front-pluggable MICs

A feature ID is assigned to every license upgrade for enhancing port capacity. Table 57 displays the chassis types and their associated port capacity, I2C ID, base capacity, feature ID, feature name, and the final capacity after a license upgrade.

Table 57 Upgrade Licenses for Enhancing Port Capacity

Chassis Type	Port Capacity	I2C ID	Base Capacity	Feature ID and Feature Name	Upgrade Capacity
MX5	20G	0x556	Slot 1 1. 1/MIC0	f1—MX5 to MX10 upgrade	Slot 1 and 2 1. 1/MIC0 2. 1/MIC1
MX10	40G	0x555	Slot 1 and 2 1. 1/MIC0 2. 1/MIC1	f2—MX10 to MX40 upgrade	Slot 2 and first 2 ports on Slot 0 1. 1/MIC1 2. First 2 ports on 0/MIC0
MX40	60G	0x554	Slot 1, SLot 2 and first 2 ports on Slot 0 1. 1/MIC0 2. 1/MIC1 3. First 2 ports on 0/MIC0	f3—MX40 to MX80 upgrade	Slot 2 and all ports on Slot 0 1. 1/MIC1 2. All 4 ports on 0/MIC0

When installing an upgrade license for enhancing port capacity on MX5, MX10 and MX40 routers, consider the following:

1. To upgrade an MX5 router to MX80 router capacity, licenses for all three features (f1, f2, f3) must be installed. All three features can be provided in a single license key.

2. To upgrade an MX10 router to MX40 router capacity, installing a license key with f2 feature is sufficient.

3. Non-applicable feature IDs in a license key reject the upgrade license. For example:

   1. An f1 feature ID on an MX10 upgrade license key rejects the license.

   2. Feature IDs f1 and f2 on an MX40 upgrade license key reject the entire license.

Port Activation on MX104 Routers

Starting with Junos OS Release 13.3, license keys are available to activate the ports on the MX104 router. MX104 routers have four built-in ports. By default, in the absence of valid licenses, all four built-in ports are deactivated. By installing licenses, you can activate any two of the four or all of the four built-in ports. For instance, you can install a license to activate the first two built-in ports (xe-2/0/0 and xe-2/0/1) or you can install a license to activate the next two built-in ports (xe-2/0/2 and xe-2/0/3). You can also install a license to activate all four built-in ports (xe-2/0/0, xe-2/0/1, xe-2/0/2, and xe-2/0/3). If you have already activated two of the built-in ports, you can install an additional license to activate the other two built-in ports on the MX104 router.

A feature ID is assigned to every license for activating the built-in ports on the MX104 router. The port license model with the feature ID is described in the Table 58.

Table 58 Port Activation License Model for MX104 Routers

Feature ID	Feature Name	Functionality
F1	MX104 2X10G Port Activate (0 and 1)	Ability to activate first two built-in ports (xe-2/0/0 and xe-2/0/1)
F2	MX104 2X10G Port Activate (2 and 3)	Ability to activate next two built-in ports (xe-2/0/2 and xe-2/0/3)

Both the features are also provided in a single license key for ease of use. To activate all four ports, you must either install the licenses for both the features or the single license key for both features. If you install the single license key when feature IDs F1 and F2 are already installed, the license does not get rejected. Also, MX104 routers do not support the graceful license expiry policy. A graceful license expiry policy allows the use of a feature for a certain period of time (usually a grace period of 30 days), and reverts if the license for that feature is not installed after the grace period.

Release History Table

Release	Description
15.1	Starting in Junos OS Release 15.1, to ensure that license keys are used properly, Juniper Networks license key generation is enhanced to specify a customer ID in the license key.

Licenses for Routing Devices

Licenses for ACX Series

Software Features Requiring Licenses on ACX5448-D and ACX5448-M Routers

Each feature license is tied to one software feature, and that license is valid for one device. Each license allows you to run the specified software features on a single device.

Table 59 lists the licensed features that you can purchase for ACX5448-D and ACX5448-M Series Universal Metro Routers.

Table 59 Junos OS Feature License Model Number for ACX5448-D and ACX5448-M Series Universal Metro Routers

Supported Device	Licenses Software Feature	License Model	Scale	Model Number
ACX5448-D and ACX5448-M	IP, MPLS, timing, CoS, E-OAM, telemetry, RFC2544	Advanced	32 L3VPN and 8 NG-MVPN	S-ACX-400G-A-1 S-ACX-400G-A-3 S-ACX-400G-A-5
ACX5448-D and ACX5448-M	All advanced software subscription license features with full-scale.	Premium	Full-scale	S-ACX-400G-P-1 S-ACX-400G-P-3 S-ACX-400G-P-5

Licenses for PTX, MX, M and T Series

Software Features That Require Licenses on M Series, MX Series, and T Series Routers

Table 60 lists the licenses you can purchase for each M Series, MX Series, and T Series software feature. Each license allows you to run the specified software feature on a single device.

The DHCP server functionality for Junos OS is part of the subscriber management feature. You must have the S-SA-FP or S-MX104-SA-FP license in order to enable the DHCP server. For service accounting, you must also have S-SSM-FP.

For information about how to purchase a software license, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

Table 60 Junos OS Feature License Model Number for M Series, MX Series, and T Series Routers

Licensed Software Feature	Supported Devices	Model Number
Generalized Multiprotocol Label Switching (GMPLS) Support on Junos OS	M10i, M7i, M120, M160, M20, M320, M40e, T320, T640, and MX Series Routers	JS-GMPLS
IPv6 Support on Junos OS	M120, M160, M20, M320, M40e, T320, T640, and MX Series Routers	JS-IPv6
Logical Router Support for Junos OS	M10i, M120, M160, M20, M320, M40e, M7i, T320, T640, and MX Series Routers	JS-LR
Chassis license for Application Traffic Optimization service, policy enforcement and application statistics. This license includes S-AI and S-LDPF fucntionality and 1-year Signature Subscription License	MX104, MX240, MX480, MX960, M Series, and T Series Routers	S-ATO
Software License for Passive Monitoring Flow Collector Application, supporting 100 Kpps throughput; Chassis based license for Multiservices PIC	M320, T640, T320, T1600	S-COLLECTOR-100K
License to use Compressed Real-Time Transport Protocol (CRTP) feature in AS PIC and Multiservices PIC	M10i, M120, M160, M20, M320, M40e, M7i, T320, M10, M5, T640, and T1600	S-CRTP
Software License for Passive Monitoring DFC Application, supporting 100Kpps throughput; Chassis based license for Multiservices PIC	M320, T640, T320, and T1600	S-DFC-100K
Security Services license for AS PIC and Multiservices PIC	M10i, M7i, M5, M120, M160, M20, M320, M40e, T320, T640, M10, and T1600	S-ES
Chassis license for IDP service, policy enforcement. This license includes S-AI and S-LDPF fucntionality and 1-year Signature Subscription License	MX104, MX240, MX480, MX960, M Series, and T Series Routers	S-IDP

Licensed Software Feature	Supported Devices	Model Number
Junos-FIPS Software License	M10i, M7i, M320, M40e, T320, and T640	S-JUNOS-FIPS
Link Services Software License—up to 1023 ML bundles per Chassis for Multiservices PIC and Multiservices Dense Port Concentrator (DPC)	M5, M7i, M10, M10i, M20, M40e, M120, M320, T320, T640, T1600, MX240, MX480, and MX960	S-LSSL-1023
Link Services Software Ugrade License—from 255 to 1023 ML bundles per Chassis for Multiservices PIC and Multiservices DPC	M5, M7i, M10, M10i, M20, M40e, M120, M320, T320, T640, T1600, MX240, MX480, and MX960	S-LSSL-1023-UPG
Link Services Software Ugrade License—from 64 to 255 ML bundles per Chassis for AS PIC, Multiservices PIC, and Multiservices DPC	M5, M7i, M10, M10i, M20, M40e, M120, M320, T320, T640, T1600, MX240, MX480, and MX960	S-LSSL-255-UPG
Link Services Software License—up to 255 ML bundles per Chassis for AS PIC, Multiservices PIC, and Multiservices DPC	M10, M7i, M5, M120, M20, M320, M40e, T320, T640, M10i, T1600, MX240, MX480, and MX960	S-LSSL-256
Link Services Software License—up to 4 ML bundles per Chassis for AS PIC, Multiservices PIC, and Multiservices DPC	M10i, M120, M20, M320, M40e, M7i, T320, M10, M5, T640, T1600, MX240, MX480, and MX960	S-LSSL-4
Link Services Software License—up to 64 ML bundles per Chassis for AS PIC, MS PIC and MS DPC	M10, M7i, M5, M120, M20, M320, M40e, T320, T640, M10i, T1600, MX240, MX480, and MX960	S-LSSL-64
Link Services Software Upgrade License—from 4 to 64 ML bundles per Chassis for AS PIC, Multiservices PIC, and Multiservices DPC	M5, M7i, M10, M10i, M20, M40e, M120, M320, T320, T640, T1600, MX240, MX480, and MX960	S-LSSL-64-UPG
Software License for Passive Monitoring Flow Monitor Application, supporting 1M flows. Chassis based license for Multiservices PIC	M320, T640, T320, and T1600	S-MONITOR-1M

Licensed Software Feature	Supported Devices	Model Number
Network Address Translation (NAT), FW license on AS PIC and Multiservices PIC: Multi-instance	M10, M7i, M5, M120, M160, M20, M320, M40e, T320, T640, M10i, and T1600	S-NAT-FW-MULTI
NAT, FW license on AS PIC and Multiservices PIC: Single-instance	M10, M7i, M5, M120, M160, M20, M320, M40e, T320, T640, M10i, and T1600	S-NAT-FW-SINGLE
Software license for Packet trigger subscriber policy	MX240, MX480, MX960, M120, and M320	S-PTSP
Subscriber Access Feature Pack License Scaling (128000)	MX104, MX240, MX480, MX960, M120, and M320	S-SA-128K
Subscriber Access Feature Pack License Scaling (32000)	MX104, MX240, MX480, MX960, M120, and M320	S-SA-32K
Subscriber Access Feature Pack License Scaling (4000)	MX104, MX240, MX480, MX960, M120, M320, and MX80	S-SA-4K
Subscriber Access Feature Pack License Scaling (64000)	MX104, MX240, MX480, MX960, M120, and M320	S-SA-64K
Subscriber Access Feature Pack License Scaling (8000)	MX104, MX240, MX480, MX960, M120, M320, and MX80	S-SA-8K
Subscriber Access Feature Pack License Scaling (96000)	MX104, MX240, MX480, MX960, M120, and M320	S-SA-96K
Subscriber Access Feature Pack license	MX104, MX240, MX480, MX960, M120, and M320	S-SA-FP
Stateful Failover for Services on AS PIC and Multiservices PIC: Multilink PPP (MLPPP) only	M10, M7i, M5, M120, M160, M20, M320, M40e, T320, T640, M10i, and T1600	S-SERVICES-SFO
Subscriber Service Management Feature Packet License (RADIUS/SRC based Service Activation and Deactivation) Per-Service Accounting Features for Subscribers	MX104, MX240, MX480, MX960, M120, and M320	S-SSM-FP
Subscriber Traffic Lawful Intercept Feature Pack License	MX240, MX480, MX960, M120, M320, and MX80	S-SSP-FP

Licensed Software Feature	Supported Devices	Model Number
Software license for application aware traffic direct feature	MX240, MX480, MX960, M120, and M320	S-TFDIRECT-APP
Software license for subscriber aware traffic direct feature	MX240, MX480, MX960, M120, and M320	S-TFDIRECT-SUB
Video Services Feature Pack license	M120, M320, MX80, MX104, MX240, MX480, and MX960	S-VIDEO-FP
Port capacity enhancement Feature Pack License for MX5 routers	MX5	mx5-to-mx10-upgrade
Port capacity enhancement Feature Pack License for MX10 routers	MX10	mx10-to-mx40-upgrade
Port capacity enhancement Feature Pack License for MX40 routers	MX40	mx40-to-mx80-upgrade

Software Features That Require Licenses on MX Series Routers Only

Table 61 lists the licenses you can purchase for each MX Series software feature. Each license allows you to run the specified software feature on a single device.

1. This is not a complete list of licenses. Contact your Juniper Networks representative for license information.

2. License is not required to use NAT feature on MX150, MX204, and MX10003 routers.

For information about how to purchase a software license, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

MX Series Routers and MPC Service Cards support Flex Licensing. For more information on supported platforms and features, see Flex Software License for MX Series Routers and MPC Service Cards.

The DHCP server functionality for Junos OS is part of the subscriber management feature. You must have the S-SA-FP or S-MX104-SA-FP license in order to enable the DHCP server. For service accounting, you must also have S-SSM-FP.

Starting in Junos OS Release 16.1R1, after the completion of the 30 day grace period, DHCP bindings on MX series devices are limited to 10. This counts against broadband scale licenses S-MX104-SA-FP and S-SA-4K.

Licensing details for DHCP Relay Configurations—If processing `dhcp-relay relay-option-82` is not required, then configure the `forward-only` statement under the `[edit forwarding-options dhcp-relay relay-option (default-action | equals | starts-with)]` hierarchy-level instead of configuring `dhcp-relay` directly. The

`forward-only` DHCP Relay configurations do not require the S-SA-FP license to be installed. Also, configuring `forward-only` DHCP Relay assumes that the peer DHCP server is capable of returning `relay-option-82` attributes originally sent via the DHCP Relay.

Subscriber Access Feature Pack (SKUs - S-SA-FP and S-MX104-SA)

1. Per subscriber RADIUS accounting (time and volume based) – require SSM for per service accounting

2. RADIUS-based authentication and authorization

3. Subscriber configuration through client profiles at subscriber login

4. You require the S-SSM-FP SKU to change variable values within client profiles through radius grant or access accept, COA or RID, and SRC

5. RADIUS and SDX based address pool management

6. Static and dynamic IP management

7. Dynamic auto-sensed VLANs

8. Video edge services (S-SA-FP SKU is the superset and the S-VIDEO-FP SKU is not required)

Subscriber Services Management Feature Pack (SKUs - S-SSM-FP and S-MX104-SSM-FP)

1. Per service RADIUS accounting (time and volume based)

2. Activate or deactivate service profiles at subscriber login through the RADIUS grants or access accepts (services activation and deactivation VSAs) or changes to existing sessions through the RADIUS COA or RID, or SRC

3. Parameterization of service profiles

4. ANCP QoS adjustment based on synchronization rate through ANCP

Table 61 Junos OS Feature License Model Number for MX Series Routers

Licensed Software Feature	Supported Devices	Model Number
License to use IDS for DDoS mitigation on services card NPU. The license is per NPU for MS-MIC and MS-MPC service cards.	MS-MPC service card is supported on MX240, MX480, MX960, MX2008, MX2010, and MX2020 MS-MIC service card is supported on MX5 through MX104, MX240, MX480, MX960, MX2008, MX2010, and MX2020	S-IDS-NPU
Upgrade license—from MX80-10G to MX80-40G	MX80	MX80-10G40G-UPG-B
Upgrade license—from MX80-40G to full MX80	MX80	MX80-40G-UPG-B
Upgrade license—from MX80-5G to MX80-10G	MX80	MX80-5G10G-UPG-B
Upgrade license to activate 2x10GE P2&3	MX104	S-MX104-ADD-2X10GE
Upgrade license to activate 2X10GE P0&1	MX104	S-MX104-UPG-2X10GE
Upgrade license to activate 4X10GE fixed ports on MX104	MX104	S-MX104-UPG-4X10GE
License to support per VLAN queuing on MX104	MX104	S-MX104-Q
Chassis-based software license for inline J-Flow monitoring on MX5, MX10, M40, MX80, and MX104 Series routers	MX5, MX10, MX40, MX80, and MX104	S-JFLOW-CH-MX5-104
Chassis-based software license for inline J-Flow monitoring on MX240 routers	MX240	S-JFLOW-CH-MX240

Licensed Software Feature	Supported Devices	Model Number
Chassis-based software license for inline J-Flow monitoring on MX480 routers	MX480	S-JFLOW-CH-MX480
Chassis-based software license for inline J-Flow monitoring on MX960 routers	MX960	S-JFLOW-CH-MX960
Chassis-based software license for inline J-Flow monitoring on MX2008 routers	MX2008	S-JFLOW-CH-MX2008
Chassis-based software license for inline J-Flow monitoring on MX2010 routers	MX2010	S-JFLOW-CH-MX2010
Chassis-based software license for inline J-Flow monitoring on MX2020 routers	MX2020	S-JFLOW-CH-MX2020
Flow monitoring and accounting features using J-Flow service on any Modular Port Concentrator (MPC) or MS-DPC	MX240, MX480, and MX960	S-ACCT-JFLOW-CHASSIS
Software License for in-line J-Flow service on Trio MPCs	MX240, MX480, MX960, MX2008, MX2010, and MX2020	S-ACCT-JFLOW-IN
Flow monitoring and accounting features using J-Flow service on any MPC limited to 5G of total JFLOW traffic	MX80	S-ACCT-JFLOW-IN-5G
Security services (IPsec, VPN and group VPN) license based on a single NPU for MS-MIC, MS-DPC or MS-MPC	MX Series Routers	S-ES-NPU
2000 IKE sessions on MS-DPC; Chassis based, limited to 6000 per Chassis	MX240, MX480, and MX960	S-ES-2K

Licensed Software Feature	Supported Devices	Model Number
4000 IKE sessions on MS-DPC; Chassis based, limited to 6000 per Chassis	MX240, MX480, and MX960	S-ES-4K
Upgrade from 2000 IKE sessions to 4000 IKE sessions on MS-DPC; Chassis based, limited to 6000 per Chassis	MX240, MX480, and MX960	S-ES-4K-UPG
6000 IKE sessions on MS-DPC; Chassis based, limited to 6000 per Chassis	MX240, MX480, and MX960	S-ES-6K
Upgrade from 4000 IKE sessions to 6000 IKE Sessions on MS-DPC; Chassis based, limited to 6000 per Chassis	MX240, MX480, and MX960	S-ES-6K-UPG
License to run stateful firewall on one NPU per MS-MIC, MS-DPC or MS-MPC	MX Series Routers	S-FW-NPU
License to support DS3 Channelization (down to DS0) on each Modular Interface Card (MIC) for MIC-3D-8DS3-E3	MX5, MX10, MX40, MX80, MX104, MX240, MX480, MX960, MX2010, and MX2020	S-MIC-3D-8CHDS3
License to support 256K routes	MX104	S-MX104-ADV-R1
License to support scaling Layer 3 and VPN routes to 1 million or more entries on MX104 platforms	MX104	S-MX104-ADV-R2
License to support full-scale Layer 3 routes and Layer 3 VPN on each slot for port queuing MPCs	MX240, MX480, MX960, MX2010, and MX2020	S-MPC-3D-PQ-ADV-R
License to support Precision Timing Protocol (PTP)	MX204, MX240, MX480, MX960, MX10003, MX10008, and MX10016	S-MPC-3D-PTP

Licensed Software Feature	Supported Devices	Model Number
License to support full-scale Layer 3 routes and Layer 3 VPN on each slot for hierarchical quality of service (HQoS) MPCs	MX240, MX480, MX960, MX2010, and MX2020	S-MPC-3D-VQ-ADV-R
Subscriber Management Feature Pack License	MX104	S-MX104-SA-FP (Includes S-LNS-IN)
Subscriber Access Feature Pack License	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-FP
Subscriber Service Management Feature Packet License—RADIUS and SRC-based service activation and deactivation per-service accounting features	MX104	S-MX104-SSM-FP
	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SSM-FP
Upgrade to Traffic Direct Advanced (per MS-DPC)	MX960	S-MX-TD-UPG
License to run one instance of the NAT software on one NPU per MS-DPC	MX240, MX480, and MX960	S-NAT
License to support inline NAT software on MX5, MX10, MX40, MX80, MX104	MX5, MX10, MX40, MX80, and MX104	S-NAT-IN-MX5-104 (Replaces S-NAT-IN-MX40-MX80 and S-NAT-IN-MX5-MX10)
License to run one instance of the NAT software on one NPU per MS-MIC, MS-DPC, or MS-MPC	MX Series Routers	S-NAT-NPU (Replaces S-NAT-IN-MX40-MX80-UPG)
License to run NAT using any MPC in an MX Chassis	MX240, MX480, and MX960	S-NAT-IN-MX-CHASSIS
Subscriber Access Feature Pack License Scaling (4000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-4K

Licensed Software Feature	Supported Devices	Model Number
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 4000 through 8000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-8K
Subscriber Access Feature Pack License Scaling (8000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-8K
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 8000 through 16,000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-16K
Subscriber Access Feature Pack License Scaling (16,000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-16K
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 16,000 through 32,000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-32K
Subscriber Access Feature Pack License Scaling (32,000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-32K
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 32,000 through 64,000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-64K
Subscriber Access Feature Pack License Scaling (64,000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-64K

Licensed Software Feature	Supported Devices	Model Number
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 64,000 through 96,000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-96K
Subscriber Access Feature Pack License Scaling (96,000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-96K
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 96,000 through 128,000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-128K
Subscriber Access Feature Pack License Scaling (128,000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-128K
Upgrade license—Subscriber Access Feature Pack scaling license upgrade from 128,000 through 256,000 subscribers	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-UP-256K
Subscriber Access Feature Pack License Scaling (256,000)	MX5, MX10, MX40, MX80, MX104, MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SA-256K
Software License for Secure Flow Mirroring Service (FlowTap) (does not require MS-DPC)	MX80, MX104, MX240, MX480, and MX960	S-SFM-FLOWTAP-IN
License to run one instance of the SFW and software on a MS-DPC	MX960, MX480, and MX240	S-SFW
Software license for one member of an MX Virtual Chassis	MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-VCR

Licensed Software Feature	Supported Devices	Model Number
Upgrade license—from MX10 to equivalent of MX40; allows additional 2x10G fixed ports to be used on the MX10 router	MX10-T	MX10-40-UPG
Upgrade license—from MX10 to equivalent of MX80; allows additional 4x10G fixed ports to be used on the MX10 router	MX10-T	MX10-80-UPG
Upgrade license—from MX40 to equivalent of MX80; allows additional 2x10G fixed ports to be used on the MX40 router	MX40-T	MX40-80-UPG
Upgrade license—from MX5 to equivalent of MX10; allows second MIC slot to be used on the MX5 router	MX5-T	MX5-10-UPG
Upgrade license—from MX5 to equivalent of MX40; allows second MIC slot and 2x10G fixed ports to be used on the MX5 router	MX5-T	MX5-40-UPG
Upgrade license—from MX5 to equivalent of MX80. Allows second MIC slot and 4x10G fixed ports to be used on the MX5 router	MX5-T	MX5-80-UPG
License to use MX as Controller or Aggregation device for Junos Fusion. One license per MX is needed.	MX5, MX10, MX40, MX80, MX104, MX240, MX480, MX960, MX2010, and MX2020	S-MX-AD-FUSION-LIC
License to run any supported EX4300 model as a satellite device in Junos Fusion mode. One license per EX4300 is needed	MX204, MX240, MX480, MX960, MX2010, MX2020, and MX10003	S-MX-SAT-EX4300

Licensed Software Feature	Supported Devices	Model Number
License to run any supported QFX5100 model as a satellite device in Junos Fusion mode. One license per QFX5100 is needed	MX204, MX240, MX480, MX960, MX2010, MX2020, and MX10003	S-MX-SAT-QFX5100
Subscriber Traffic Lawful Intercept Feature Pack License Software License for FlowTapLite	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-SSP-FP
Junos BB Policy Enforcement Feature License for dynamic subscriber authentication and authorization using NASREQ (1 per chassis)	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-BB-NASREQ
Junos BB Policy Enforcement feature license for PCRF communications using 3GPP Gx and Gx+ (1 per chassis)	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-BB-GX
Junos BB Policy Enforcement feature license for online charging using 3GPP Gy interface (1 per chassis)	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-BB-GY
Software License for Inline L2TP LNS (MX204, MX240/480/960, MX2008, MX2010/2020) (1 per chassis)	MX204, MX240, MX480, MX960, MX2008, MX2010, MX2020, and MX10003	S-LNS-IN

Software Features That Require Licenses on M Series Routers Only

Table 62 lists the licenses you can purchase for each M Series software feature. Each license allows you to run the specified software feature on a single device.

For information about how to purchase a software license, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

Table 62 Junos OS Feature License Model Number for M Series Routers

Licensed Software Feature	Supported Devices	Model Number
J-Flow accounting license on Integrated Adaptive Services Module (ASM) and Integrated Multiservices Module	M7i	S-ACCT-BB
Security Services license on ASM and Integrated Multiservices Module	M7i	S-ES-BB
Layer 2 Tunneling Protocol (L2TP) L2TP Network Server (LNS) license for 16000 sessions on Multiservices PIC	M120	S-LNS-16K
L2TP LNS license Upgrade—from 8000 to 16000 sessions on Multiservices PIC	M120	S-LNS-16K-UPG
L2TP LNS license for 2000 sessions on AS PIC or Integrated Adaptive Services Module and Multiservices PIC	M7i, M10i, and M120	S-LNS-2K
L2TP LNS license for 4000 sessions on AS PIC or Integrated Adaptive Services Module and Multiservices PIC	M7i, M10i, and M120	S-LNS-4K
L2TP LNS license Upgrade—from 2000 to 4000 sessions on AS PIC or Integrated Adaptive Services Module and Multiservices PIC	M7i, M10i, and M120	S-LNS-4K-UPG
L2TP LNS license for 8000 sessions on Multiservices PIC	M7i, M10i, and M120	S-LNS-8K
L2TP LNS license Upgrade—from 4000 to 8000 sessions on AS PIC and Multiservices PIC	M7i, M10i, and M120	S-LNS-8K-UPG
Link services software license on integrated ASM and Integrated Multi Services Module—up to 4 ML bundles	M7i	S-LSSL-BB
NAT, FW license on Integrated ASM and Integrated Multi Services Module: Multi instance	M7i	S-NAT-FW-MULTI-BB
NAT, FW license on Integrated ASM and Integrated Multi Services Module: Single instance	M7i	S-NAT-FW-SINGLE-BB
Tunnel services software license for AS PIC and Multiservices PIC (chassis license)	M7i and M10i	S-TUNNEL

License Modes for PTX Series Routers

PTX Series routers are available in two license variants: IR and R. Depending on the license purchased, the router offers full IP or LSR.

Table 63 describes the two license variants for the PTX1000.

Table 63 License Variants for the PTX1000

License	Description	Scale Restictions
IR	Scaled up LSR and peering	1. Up to 1 million routes in the forwarding information base (FIB) 2. Up to 6 million routes in the routing information base (RIB) 3. Up to 256 routing instances of the virtual routing and forwarding (VRF) instance type 4. Up to 128 thousand LSPs
R	Full IP core	None

The PTX1000 licenses are non-transferable.

You can upgrade the IR license scale to R license scale through an upgrade license. For example, the PTX1K-72Q-AC-IR can be upgraded to PTX1K-72Q-AC-R using the S-PTX1K-72Q-SCA-UP upgrade license.

The `license-mode` statement is only supported on the PTX3000 and PTX5000 Series routers with third-generation FPCs.

Table 64 describes the two license variants for the PTX3000 and PTX5000.

Table 64 License Variants for the PTX3000 and PTX5000 FPCs

License	Description	Scale Restrictions
IR	Scaled up LSR and peering	1. Up to 2 million routes in the forwarding information base (FIB) 2. Up to 6 million routes in the routing information base (RIB) 3. Up to 256 routing instances of the virtual routing and forwarding (VRF) instance type 4. Up to 128 thousand LSPs
R	Full IP core	None

For the PTX3000 and PTX5000, If you purchase two FPCs: one with an IR license and one with an R license. After the FPCs are installed on a router, both FPCs appear identical. To distinguish between an FPC with an IR license and an FPC with an R license after the FPC is installed on the router, you must configure the license mode based on the license purchased. For instance, if you purchased an FPC with the IR license, you must configure the license mode for that FPC as IR. The license mode settings are set specific to each FPC slot. If the FPC is installed in a different slot, or moved to another device, the license mode settings must be reconfigured on the new slot or device. Also, the license mode settings previously configured must be deleted.

The license mode settings are used only to provide information. You cannot set or alter the license of the FPC by configuring the license mode.

To view the current license mode settings, from the configuration mode, use the `show chassis fpc` command. To view the current license mode settings, from the operational mode, use the `show chassis hardware extensive` command. To delete the existing license mode settings, use the `delete chassis fpc` command.

License Modes for Enhanced MPCs Overview

Enhanced MPCs are available in three license variants. Before Junos OS Release 16.1, there were two variants: infrastructure routing (IR) and routing (R). Starting in Junos OS Release 16.1, there is also a base variant, making a total of three licence variants. All variants support an identical feature set, but with a few scale differences.

Broadband Edge feature requires minimum -IR license in addition to feature licenses.

Table 65 describes the three license variants.

Table 65 License Variants for MPCs

License	How to Identify	Description
base	No special suffix in the license name.	1. All Layer 2, Layer 2.5, and Layer 3 features. 2. Up to 32 Layer 3 routing instances of the virtual routing and forwarding (VRF) instance. The VRF support includes Layer 3 VPN (L3VPN). 3. Up to 2 million routes in the forwarding information base (FIB), provided there is hardware support. (FIB is also known as forwarding table.) 4. Up to 6 million routes in the routing information base (RIB), also known as routing table. 5. Broadband Edge feature requires minimum -IR license in addition to feature licenses.
IR	-IR suffix in the license name.	1. All Layer 2, Layer 2.5, and Layer 3 features. 2. Up to 32 Layer 3 routing instances of the virtual routing and forwarding (VRF) instance. The VRF support includes Layer 3 VPN (L3VPN).
R	-R suffix in the license name.	Full-scale Layer 2, Layer 2.5, and Layer 3 features. Scale is determined by the hardware capabilities.

Suppose you have purchased two MPC4Es: one with IR license and one with R license. After the MPCs are installed on a router, both MPCs appear identical. To distinguish between an MPC with an IR license and an MPC with an R license after the MPC is installed on the router, you must configure the license mode based on the license purchased. For instance, if you have purchased an MPC with the IR license, you must configure the license mode for that MPC as IR. The license mode settings are set specific to each MPC slot. If the MPC is installed in a different slot, or moved to another device, the license mode settings must be reconfigured on the new slot or device. Also, the license mode settings previously configured must be deleted.

The license mode settings are used only to provide information. You cannot set or alter the license of the MPC by configuring the license mode.

To view the current license mode settings on an MPC, from the configuration mode, use the `show chassis fpc` command. To view the current license mode settings on an MPC, from the operational mode, use

the `show chassis hardware extensive` command. To delete the existing license mode settings on an MPC, use the `delete chassis fpc` command.

Licensable Ports on MX5, MX10, and MX40 Routers

Starting with Junos OS Release 12.2, license keys are available to enhance the port capacity on MX5, MX10, and MX40 routers up to the port capacity of an MX80 router. The MX5, MX10, and MX40 routers are derived from the modular MX80 chassis with similar slot and port assignments, and provide all functionality available on an MX80 router, but at a lower capacity. Restricting port capacity is achieved by making a set of MIC slots and ports licensable. MICs without a license are locked, and are unlocked or made usable by installing appropriate upgrade licenses.

The base capacity of a router is identified by the Ideeprom assembly ID (I2C ID), which defines the board type. However, the Junos OS licensing infrastructure allows the use of restricted ports without a license for a grace period of 30 days. After the grace period expires, the router reverts back to the base capacity if no upgrade license is purchased and installed for the locked ports. The I2C ID along with an upgrade license determine the final capacity of an MX5, MX10, or MX40 router.

The MX5, MX10, MX40, and MX80 routers support the following types of MICs:

1. A built-in 10-Gigabit Ethernet MIC with four 10-Gigabit Ethernet ports

2. Two front-pluggable MICs

A feature ID is assigned to every license upgrade for enhancing port capacity. Table 66 displays the chassis types and their associated port capacity, I2C ID, base capacity, feature ID, feature name, and the final capacity after a license upgrade.

Table 66 Upgrade Licenses for Enhancing Port Capacity

Chassis Type	Port Capacity	I2C ID	Base Capacity	Feature ID and Feature Name	Upgrade Capacity
MX5	20G	0x556	Slot 1 1. 1/MIC0	f1—MX5 to MX10 upgrade	Slot 1 and 2 1. 1/MIC0 2. 1/MIC1
MX10	40G	0x555	Slot 1 and 2 1. 1/MIC0 2. 1/MIC1	f2—MX10 to MX40 upgrade	Slot 2 and first 2 ports on Slot 0 1. 1/MIC1 2. First 2 ports on 0/MIC0

Chassis Type	Port Capacity	I2C ID	Base Capacity	Feature ID and Feature Name	Upgrade Capacity
MX40	60G	0x554	Slot 1, SLot 2 and first 2 ports on Slot 0 1. 1/MIC0 2. 1/MIC1 3. First 2 ports on 0/MIC0	f3—MX40 to MX80 upgrade	Slot 2 and all ports on Slot 0 1. 1/MIC1 2. All 4 ports on 0/MIC0

When installing an upgrade license for enhancing port capacity on MX5, MX10 and MX40 routers, consider the following:

1. To upgrade an MX5 router to MX80 router capacity, licenses for all three features (f1, f2, f3) must be installed. All three features can be provided in a single license key.

2. To upgrade an MX10 router to MX40 router capacity, installing a license key with f2 feature is sufficient.

3. Non-applicable feature IDs in a license key reject the upgrade license. For example:

    1. An f1 feature ID on an MX10 upgrade license key rejects the license.

    2. Feature IDs f1 and f2 on an MX40 upgrade license key reject the entire license.

Port Activation on MX104 Routers

Starting with Junos OS Release 13.3, license keys are available to activate the ports on the MX104 router. MX104 routers have four built-in ports. By default, in the absence of valid licenses, all four built-in ports are deactivated. By installing licenses, you can activate any two of the four or all of the four built-in ports. For instance, you can install a license to activate the first two built-in ports (xe-2/0/0 and xe-2/0/1) or you can install a license to activate the next two built-in ports (xe-2/0/2 and xe-2/0/3). You can also install a license to activate all four built-in ports (xe-2/0/0, xe-2/0/1, xe-2/0/2, and xe-2/0/3). If you have already activated two of the built-in ports, you can install an additional license to activate the other two built-in ports on the MX104 router.

A feature ID is assigned to every license for activating the built-in ports on the MX104 router. The port license model with the feature ID is described in the Table 67.

Table 67 Port Activation License Model for MX104 Routers

Feature ID	Feature Name	Functionality
F1	MX104 2X10G Port Activate (0 and 1)	Ability to activate first two built-in ports (xe-2/0/0 and xe-2/0/1)
F2	MX104 2X10G Port Activate (2 and 3)	Ability to activate next two built-in ports (xe-2/0/2 and xe-2/0/3)

Both the features are also provided in a single license key for ease of use. To activate all four ports, you must either install the licenses for both the features listed in Table 67 or the single license key for both features. If you install the single license key when feature IDs F1 and F2 are already installed, the license does not get rejected. Also, MX104 routers do not support the graceful license expiry policy. A graceful license expiry policy allows the use of a feature for a certain period of time (usually a grace period of 30 days), and reverts if the license for that feature is not installed after the grace period.

Subscriber Access Licensing Overview

To enable some Juniper Networks Junos OS features or router scaling levels, you might have to purchase, install, and manage separate software license packs. The presence on the router of the appropriate software license keys (passwords) determines whether you can configure and use certain features or configure a feature to a predetermined scale.

You need only one license if the DHCP dual stack session running with a single SDB session. To configure the single SDB session, use the `classification-key` option in the `edit system services dhcp-local-server` hierarchy .

Table 68 describes number of subscriber interface and license required on subscriber access models.

Table 68 Number of Licenses Required per Access Model

Access Model	Number of Licenses Required
CVLAN DHCPv4	1
CVLAN PPPoEv4	1
CVLAN Dual Stack DHCP	1 (single SDB session) 2 (two SDB session)
CVLAN Dual Stack PPPoE	1
Pseudowire Headend Termnation (PWHT) DHCPv4	1
PWHT PPPoEv4	1
PWHT Dual Stack DHCP	1 (single SDB session) 2 (dual SDB session)
PWHT Dual Stack PPPoE	1
Agent circuit identifier (ACI) DHCPv4	Number of sessions with same ACI
ACI PPPoEv4	Number of sessions with same ACI
Layer 2 Tunneling Protocol (L2TP) Point-to-Point Protocol (PPP) or L2TP access concentrator (LAC)	1
L2TP Point-to-Point Protocol (PPP) or L2TP network server (LNS)	1

Access Model	Number of Licenses Required
L2TP Dual Stack PPP or LNS	1
L2TP tunnel switch (LTS) PPPv4	1
LTS version Dual Stack PPP	1
Wi-Fi access gateway (WAG) DHCPv4	1
WAG Dual Stack DHCP	1 (single SDB session) 2 (dual SDB session)
Hybrid access gateway (HAG) generic routing encapsulation (GRE)v4	1
Hybrid access gateway (HAG) Dual Stack GRE	1 (single SDB session) 2 (two SDB session)
Fixed wireless	1

For the latest information about subscriber access licensing, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

Subscriber Secure Policy Licensing Requirements

To enable and use subscriber secure policy, you must install and properly configure the Subscriber Secure Policy license.

Address-Assignment Pools Licensing Requirements

The address-assignment pool feature is part of the Junos OS Subscriber Management Feature Pack license. You must install and properly configure the license to meet the requirements for using the address-assignment pool feature.

Release History Table

Release	Description
16.1R1	Starting in Junos OS Release 16.1R1, after the completion of the 30 day grace period, DHCP bindings on MX series devices are limited to 10. This counts against broadband scale licenses S-MX104-SA-FP and S-SA-4K.
16.1	Starting in Junos OS Release 16.1, there is also a base variant, making a total of three licence variants.
14.2	Starting with Junos OS Release 14.2, you can set the license mode for enhanced MPCs such as MPC4E, MPC5E, and MPC6.

Licenses for vMX

vMX Licenses for AWS

Licenses are required to use vMX features in the Amazon Bring Your Own License (BYOL) model on AWS. When you order licenses, this information is bound to a customer ID. If you did not order the licenses, contact your account team or Juniper Networks Customer Care for assistance.

The vMX licenses are based on application packages and processing capacity. Table 69 describes the features available with application packages.

Table 69 Application Packages for Licenses

Application Package	vMX Licenses for AWS, KVM and VMware
BASE	IP routing with up to 256,000 routes in the forwarding table Basic Layer 2 functionality, Layer 2 bridging and switching
ADVANCE	Features in the BASE application package, plus: IP routing with up to 2,000,000 routes in the forwarding table IP and MPLS switching for unicast and multicast applications Layer 2 features—Layer 2 VPN, VPLS, EVPN, and Layer 2 Circuit 16 instances of Layer 3 VPN
PREMIUM	Features in the BASE and ADVANCE application packages, plus: IP routing with up to 4,000,000 routes in the forwarding table Layer 3 VPN for IP and multicast

An application package is associated with a bandwidth license. Bandwidth licenses that are not associated with a specific application package apply to all application packages. Bandwidth licenses are additive. For example, if you add a 500 Mbps license and a 1 Gbps license, you are entitled to use 1.5 Gbps of capacity.

vMX Evaluation License

Juniper Networks provides a 60-day evaluation license for vMX. On AWS, you can try one instance for 60 days with the BYOL model without incurring hourly software charges for this instance but AWS infrastructure charges still apply.

For information about the 60-day evaluation license for vMX, see https://www.juniper.net/us/en/dm/free-vmx-trial/.

vMX License Model Numbers

The Juniper Networks licenses are based on SKUs, which represent lists of features that the license enables.

The following SKUs are supported for vMX Bring Your Own License (BYOL):

1. VMX-100M-1YR

2. VMX-250M-1YR

3. VMX-500M-1YR

4. VMX-PRM-1G-1YR

5. VMX-PRM-5G-1YR

6. VMX-PRM-10G-1YR

vMX Licenses for KVM and VMware

Licenses are required for using vMX features. When you order licenses, this information is bound to a customer ID. If you did not order the licenses, contact your account team or Juniper Networks Customer Care for assistance. When you order a license, you receive instructions for generating license activation keys on the Juniper Networks License Management System.

The vMX licenses are based on application packages and processing capacity. Table 1 describes the features available with application packages.

Table 70 describes the queuing licenses.

Table 70 vMX Queuing License

Queuing License SKU	Description
VMX-1G-Q	1 Gbps queuing
VMX-5G-Q	5 Gbps queuing
VMX-10G-Q	10 Gbps queuing
VMX-40G-Q	40 Gbps queuing
VMX-100G-Q	100 Gbps queuing

An application package is associated with a bandwidth license. vMX provides egress bandwidth in the following capacities: 100 Mbps, 250 Mbps, 500 Mbps, 1 Gbps, 5 Gbps, 10 Gbps, and 40 Gbps. Bandwidth licenses that are not associated with a specific application package apply to all application

packages. Bandwidth licenses are additive. For example, if you add a 500 Mbps license and a 1 Gbps license, you are entitled to use 1.5 Gbps of capacity.

You can download the vMX software BASE application package with 1 Mbps bandwidth and evaluate it without a license. To use additional features, you must order the appropriate license. If you delete all valid licenses, you can only use the BASE application package with 1 Mbps bandwidth.

Supported in Junos OS Release 15.1F4 you can download the vMX software BASE application package with 1 Mbps bandwidth and evaluate it for 30 days without a license. To use additional features beyond the 30 days, you must order the appropriate license.

If you upgrade from a BASE package license to an ADVANCE or PREMIUM package license or if you downgrade from an ADVANCE or PREMIUM package license to a BASE package license, you must restart the routing protocol process. If your configuration has logical systems, you must restart the routing protocol process for all logical systems.

If you need to move your vMX installation to another host, you must remove vMX from the current host before installing vMX and adding the license on the new host.

Starting in Junos OS Release 17.2 with the appropriate vMX PREMIUM license, you can evaluate vBNG without a vBNG subscriber scale license for 30 days. After 30 days, you are limited to 10 subscriber sessions.

To deploy a vBNG instance, you must purchase these licenses:

1. vMX PREMIUM application package license with 1 Gbps, 5 Gbps, 10 Gbps, or 40 Gbps bandwidth

2. vBNG subscriber scale license with 1000, 10 thousand, 100 thousand, or 1 million subscriber sessions for one of these tiers:

3.

Table 71 vBNG Subscriber Scale License Tiers

Tier	Description
Introductory	L2TP features including L2TP LNS services, secure policy, service activation and deactivation
Preferred	Features in the Introductory tier, and DHCP subscriber services, PPP/LAC subscriber services, DHCP relay and DHCP local server
Elite	Features in the Preferred tier, and pseudowire head end termination, Gx, and Gy

Release History Table

Release	Description
17.4	Starting in Junos OS Release 17.4 for AWS, you must add a license if you are using vMX in the Bring Your Own License (BYOL) model.
17.2	Starting in Junos OS Release 17.2 with the appropriate vMX PREMIUM license, you can evaluate vBNG without a vBNG subscriber scale license for 30 days. After 30 days, you are limited to 10 subscriber sessions.

Licenses for Switching Devices

Understanding Software Licenses for EX Series Switches

To enable and use some of the Juniper Networks operating system (Junos OS) features, you must purchase, install, and manage separate software licenses. If the switch has the appropriate software license, you can configure and use these features.

The Junos OS feature license (that is, the purchased authorization code) is universal. However, to conform to Junos OS feature licensing requirements, you must install a unique license key (a combination of the authorization code and the switch's serial number) on each switch.

For a *Virtual Chassis* deployment, two license keys are recommended for redundancy—one for the device in the primary role and the other for the device in the backup role:

1. In an EX8200 Virtual Chassis, the devices in the primary and backup roles are always XRE200 External Routing Engines.

2. In all other Virtual Chassis, the devices in the primary and backup roles are switches.

You do not need additional license keys for Virtual Chassis member switches that are in the linecard role or for the redundant Routing Engine (RE) modules or the redundant Switch Fabric and Routing Engine (SRE) modules in an EX8200 member switch.

This topic describes:

Purchasing a Software Feature License

The following sections list features that require separate licenses. To purchase a software license, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). You will be asked to supply the chassis serial number of your switch; you can obtain the serial number by running the `show chassis hardware` command.

You are required to provide the 12-digit serial number when purchasing a license for an XRE200 External Routing Engine in an EX8200 Virtual Chassis.

The serial number listed on the XRE200 External Routing Engine serial ID label is 16 digits long. Use the last 12 digits of the 16-digit serial number to purchase the license.

You can use the `show chassis hardware` command output to display the 12-digit serial number of the XRE200 External Routing Engine.

License Key Components for the EX Series Switch

When you purchase a license for a Junos OS feature that requires a separate license, you receive a license key.

A license key consists of two parts:

1. License ID—Alphanumeric string that uniquely identifies the license key. When a license is generated, it is given a license ID.

2. License data—Block of binary data that defines and stores all license key objects.

For example, in the following typical license key, the string `Junos204558` is the license ID, and the trailing block of data is the license data:

```
XXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxx
```

The license data defines the device ID for which the license is valid and the version of the license.

Features Requiring a License on EX2200 Switches

For EX2200 switches, the following features can be added to basic Junos OS by installing an enhanced feature license (EFL):

1. Bidirectional Forwarding Detection (BFD)

2. Connectivity fault management (IEEE 802.1ag)

3. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

4. OSPFv1/v2 (with four active interfaces)

5. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

6. Q-in-Q tunneling (IEEE 802.1ad)

7. Real-time performance monitoring (RPM)

8. Virtual Router

9. Virtual Router Redundancy Protocol (VRRP)

Table 72 lists the EFLs that you can purchase for EX2200 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX2200 switch.

Table 72 Junos OS Part Number on EX2200 Switches

Switch Model	Part Number
EX2200-C-12P-2G EX2200-C-12T-2G	EX-12-EFL
EX2200-24T-4G EX2200-24P-4G EX2200-24T-DC-4G	EX-24-EFL
EX2200-48T-4G EX2200-48P-4G	EX-48-EFL

Features Requiring a License on EX2300 Switches

EX2300 switches have enhanced feature licenses (EFLs).

To use the following features on the EX2300 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. Filter-based forwarding (FBF)

3. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

4. IPv6 routing protocols: Multicast Listener Discovery version 1 and 2 (MLD v1/v2), OSPFv3, PIM multicast, VRRPv3

5. Multicast Source Discovery protocol (MSDP)

6. Operations Administration Management (OAM) (Connectivity Fault Management (CFM)

7. OSPF v2/v3

8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

9. Real-time performance monitoring (RPM)

10. RIPng (RIPng is for RIP IPv6)

11. Virtual Router Redundancy Protocol (VRRP)

Table 73 lists the EFLs that you can purchase for EX2300 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX2300 switch.

Table 73 Junos OS Part Number on EX2300 Switches

Switch Model	Part Number
EX2300-C-12P EX2300-C-12T	EX-12-EFL
EX2300-24T EX2300-24P EX2300-24MP	EX-24-EFL
EX2300-48T EX2300-48P EX2300-48MP	EX-48-EFL

Virtual Chassis feature support on EX2300 switches:

1. The EX-12-EFL SKU includes the EX2300-VC (Virtual Chassis feature) license. EX2300-C-12P and EX2300-C-12T switches do not require an additional EX2300-VC license if you purchases the EFL license.

2. EX2300-24T, EX2300-24P, EX2300-24MP, EX2300-48T, EX2300-48P, and EX2300-48MP switches do not include the EX2300-VC (Virtual Chassis feature). If you want to use Virtual Chassis feature, you must purchase a separate EX2300-VC license for each EX2300 switch.

Features Requiring a License on EX3300 Switches

Two types of licenses are available on EX3300 switches: enhanced feature licenses (EFLs) and advanced feature licenses (AFLs).

To use the following features on the EX3300 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

3. IPv6 routing protocols: Multicast Listener Discovery version 1 and 2 (MLD v1/v2), OSPFv3, PIM multicast, VRRPv3, virtual router support for unicast and filter-based forwarding (FBF)

4. Intermediate System-to-Intermediate System (IS-IS)

5. OSPFv1/v2

6. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

7. Q-in-Q tunneling (IEEE 802.1ad)

8. Real-time performance monitoring (RPM)

9. Unicast reverse-path forwarding (RPF)

10. Virtual Router

11. Virtual Router Redundancy Protocol (VRRP)

Table 74 lists the EFLs that you can purchase for EX3300 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX3300 switch.

Table 74 Junos OS Part Number on EX3300 Switches

Switch Model	Part Number
EX3300-24T EX3300-24P EX3300-24T-DC	EX-24-EFL
EX3300-48T EX3300-48T-BF EX3300-48P	EX-48-EFL

To use the following feature on EX3300 switches, you must install an AFL:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. IPv6 routing protocols: IPv6 BGP and IPv6 for MBGP

3. Virtual routing and forwarding (VRF) BGP

Table 75 lists the AFLs that you can purchase for EX3300 switch models. For EX3300 switches, you must purchase and install a corresponding EFL along with the AFL to enable the advanced license features. If you have both these licenses, you can run all of the advanced software features mentioned above on your EX3300 switch.

Table 75 Junos OS AFL Part Number on EX3300 Switches

Switch Model	AFL Part Number
EX3300-24T EX3300-24P EX3300-24T-DC	EX-24-AFL
EX3300-48T EX3300-48T-BF EX3300-48P	EX-48-AFL

Features Requiring a License on EX3400 Switches

EX3400 switches has an enhanced feature licenses (EFLs) and MACSec license.

To use the following features on the EX3400 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. Filter-based forwarding (FBF)

3. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

4. IPv6 routing protocols: : Multicast Listener Discovery version 1 and 2 (MLD v1/v2), OSPFv3, PIM multicast, VRRPv3, virtual router support for unicast

5. Multicast Source Discovery Protocol (MSDP)

6. Operations Administration Management (OAM) (Connectivity Fault Management (CFM)

7. OSPF v2/v3

8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

9. Real-time performance monitoring (RPM)

10. RIPng (RIPng is for RIP IPv6)

11. Unicast reverse-path forwarding (RPF)

12. Virtual Router

13. Virtual Router Redundancy Protocol (VRRP)

Table 76 lists the EFLs that you can purchase for EX3400 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX3400 switch.

Table 76 Junos OS Part Number on EX3400 Switches

Switch Model	Part Number
EX3400-24T EX3400-24P	EX-24-EFL

Switch Model	Part Number
EX3400-48P EX3400-48T EX3400-48T-AFI EX3400-48T-DC EX3400-48T-DC-AFI	EX-48-EFL

To use the following features on the EX3400 switches, you must install an AFL:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Intermediate System-to-Intermediate System (IS-IS)

Table 77 lists the AFLs that you can purchase for EX3400 switch models. For EX3400 switches, you must purchase and install a corresponding EFL along with the AFL to enable the advanced license features. If you have both these licenses, you can run all of the advanced software features mentioned above on your EX3400 switch.

Table 77 Junos OS Part Number on EX3400 Switches

Switch Model	Part Number
EX3400-24T EX3400-24P	EX-24-AFL
EX3400-48P EX3400-48T EX3400-48T-AFI EX3400-48T-DC EX3400-48T-DC-AFI	EX-48-AFL

You must download a MACsec feature license to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX3400 switches.

Table 78 lists the MACsec model number that you can purchase for EX3400 switch models.

Table 78 Junos OS MACsec model number on EX3400 Switches

Switch Model	Model Number
EX3400	EX-QFX-MACSEC-ACC

Features Requiring a License on EX4300 Switches

Two types of licenses are available on EX4300 switches: enhanced feature licenses (EFLs) and advanced feature licenses (AFLs).

To use the following features on the EX4300 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. Connectivity fault management (IEEE 802.1ag)

3. Filter-based forwarding (FBF)

4. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

5. Multicast Source Discovery Protocol (MSDP)

6. Operations Administration Management (OAM) (Connectivity Fault Management (CFM))

7. OSPFv2/v3

8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

9. Real-time perfomance monitoring (RPM)

10. RIPng (RIPng is for RIP IPv6)

11. Unicast reverse-path forwarding (RPF)

12. Virtual Router

13. Virtual Router Redundancy Protocol (VRRP)

Table 79 lists the EFLs that you can purchase for EX4300 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX4300 switch.

Table 79 Junos OS Part Number on EX4300 Switches

Switch Model	Part Number
EX4300-24T EX4300-24P	EX4300-24-EFL

Switch Model	Part Number
EX4300-48MP EX4300-48P EX4300-48T EX4300-48T-AFI EX4300-48T-DC EX4300-48T-DC-AFI	EX4300-48-EFL
EX4300-32F EX4300-32F-DC	EX4300-32F-EFL

To use the following features on EX4300 switches, you must install an AFL:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Intermediate System-to-Intermediate System (IS-IS)

3. Ethernet VPN (EVPN) with Virtual Extensible LAN (VXLAN)
   - Supported only on EX4300-48MP switch.
   - Requires the Border Gateway Protocol (BGP) for configuration.

Table 80 lists the AFLs that you can purchase for EX4300 switch models. For EX4300 switches, you must purchase and install a corresponding EFL along with the AFL to enable the advanced license features. If you have both these licenses, you can run all of the advanced software features mentioned above on your EX4300 switch.

Table 80 Junos OS AFL Part Number on EX4300 Switches

Switch Model	AFL Part Number
EX4300-24T EX4300-24P	EX4300-24-AFL
EX4300-48MP EX4300-48P EX4300-48T EX4300-48T-AFI EX4300-48T-DC EX4300-48T-DC-AFI	EX4300-48-AFL
EX4300-32F EX4300-32F-DC	EX4300-32F-AFL

You must download a MACsec feature license (Part Number-EX-QFX-MACSEC- ACC) to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses

(EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX4300 switches.

Table 81 lists the MACsec model number that you can purchase for EX4300 switch models.

Table 81 Junos OS MACsec model number on EX4300 Switches

Switch Model	Model Number
EX4300	EX-QFX-MACSEC-ACC

Features Requiring a License on EX4600 Switches

To use the following features on EX4600 switches, you must install an advanced feature license:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Intermediate System-to-Intermediate System (IS-IS)

3. Multiprotocol Label Switching (MPLS)

4. Virtual Extensible LAN (VXLAN)

Table 82 lists the AFLs that you can purchase for EX4600 switch models.

Table 82 Junos OS AFL Part Number on EX4600 Switches

Switch Model	AFL Part Number
EX4600-40F	EX4600-AFL

You must download a MACsec feature license to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX4600 switches.

Table 83 lists the MACsec model number that you can purchase for EX4600 switch models.

Table 83 Junos OS AFL Part Number on EX4600 Switches

Switch Model	Model Number
EX4600-40F	EX-QFX-MACSEC-AGG

Features Requiring a License on EX4650 Switches

Table 84 lists the PFLs and AFLs that you can purchase for EX4650 switch models. If you have the license, you can run all of the premium and advanced software features mentioned below on your EX4650 switch.

Table 84 Junos OS Part Numbers on EX4650 Switches

Switch Model	License Type	Part Number
EX4650-48Y	Premium	EX4650-PFL
EX4650-48Y	Advanced	EX4650-AFL

Table 85 lists the standard Junos OS features which require licenses on EX4650 switches.

Table 85 Features which Require Licenses on EX4650 Switches

License Model	Detailed Features
Base Features	Basic IPv6, BFD, CFM (IEEE 802.1ag), Class of service (COS)/ Policing/Shaping/Marking, Filtering, IGMPv1/v2/v3 (includes IGMP Snooping), Junos Telemetry Interface, MC-LAG, MLDv1/v2 and MSDP, OSPFv2 and OSPFv3, PIM-DM/SM/SSM and PIMv6, Q-in-Q tunneling (IEEE 802.1ad), RIPng and RPM, Timing – Boundary Clock and Timing – Transparent Clock, Unicast reverse-path forwarding (RPF), VC, Virtual Router, VRRP, and VRRPv6, Zero Touch Provisioning (ZTP)
Premium Features	Includes all base features, BGP and MBGP, Ethernet VPN, IPv6 for BGP or MGBP, IS-IS or IPv4 and IPv6, VRF, VXLAN
Advanced Features	Includes all PFL features, MPLS, MPLS based Circuit cross-connect (CCC), Resource Reservation Protocol (RSVP) label-switched path (LSP), Segment Routing. MACsec is not supported on EX4650 switch.

Features Requiring a License on EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, EX9200 and EX9250 Switches

To use the following features on EX3200, EX4200, EX4500, EX4550, EX8200, EX9200 and EX9250 switches, you must install an advanced feature license (AFL):

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Ethernet VPN (available only on EX9200 and EX9250 switches)

3. Intermediate System-to-Intermediate System (IS-IS)

4. IPv6 routing protocols: IS-IS for IPv6, IPv6 BGP, IPv6 for MBGP

5. Logical systems (available only on EX9200 switches)

6. MPLS with RSVP-based label-switched paths (LSPs)

   Starting with Junos OS Release 17.3R1, you can enable up to 200 RSVP-TE sessions in the EX9200 advanced feature license (AFL).

7. MPLS-based circuit cross-connects (CCCs) (available only on EX4200 and EX4550 switches)

8. Open vSwitch Database (OVSDB) (available only on EX9200 switches)

9. Virtual Extensible LAN (VXLAN) (available only on EX9200 and EX9250 switches)

To use the following features on Juniper Networks EX6200 Ethernet Switches, you must install an advanced feature license (AFL):

1. Border Gateway Protocol (BGP)

2. Intermediate System-to-Intermediate System (IS-IS)

3. IPv6 routing protocols: IS-IS for IPv6, IPv6 BGP

To use MACsec feature on Juniper Networks EX9253 Switches, you must install an security feature license (SFL).

To use Forwarding Information Base (FIB) and Address Resolution Protocol (ARP) features on Juniper Networks EX9251 and EX9253 Switches, you must install an mid-scale license (ML).

Table 86 lists the AFLs that you can purchase for EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, EX9200 and EX9250 switches. If you have the license, you can run all of the advanced software features mentioned above on your EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, or EX9200 switch. An EFL is not applicable to this range of switches.

Table 86 Junos OS AFL Part Number on EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, EX9200 and EX9250 Switches

Switch Model	AFL Part Number
EX3200-24P EX3200-24T EX4200-24F EX4200-24P EX4200-24PX EX4200-24T	EX-24-AFL
EX3200-48P EX3200-48T EX4200-48F EX4200-48P EX4200-48PX EX4200-48T	EX-48-AFL
EX4500-40F-BF EX4500-40F-BF-C EX4500-40F-FB EX4500-40F-FB-C	EX-48-AFL
EX4550	EX4550-AFL
EX6210	EX6210-AFL
EX8208	EX8208-AFL
EX8216	EX8216-AFL

Switch Model	AFL Part Number
EX-XRE200	EX-XRE200-AFL
EX9204	EX9204-AFL
EX9208	EX9208-AFL
EX9214	EX9214-AFL
EX9251	EX9251-AFL EX9251-ML
EX9253	EX9253-AFL EX9253-ML EX9253-SFL

You must download a MACsec feature license to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX4200 and EX4550 switches.

Table 87 lists the MACsec model number that you can purchase for EX4200 and EX4550 switch models.

Table 87 Junos OS MACsec model number on EX4200 and EX4550 Switches

Switch Model	Model Number
EX4550	EX-QFX-MACSEC-AGG
EX4200	EX-QFX-MACSEC-ACC

Licenses for EX Series

Understanding Software Licenses for EX Series Switches

To enable and use some of the Juniper Networks operating system (Junos OS) features, you must purchase, install, and manage separate software licenses. If the switch has the appropriate software license, you can configure and use these features.

The Junos OS feature license (that is, the purchased authorization code) is universal. However, to conform to Junos OS feature licensing requirements, you must install a unique license key (a combination of the authorization code and the switch's serial number) on each switch.

For a *Virtual Chassis* deployment, two license keys are recommended for redundancy—one for the device in the primary role and the other for the device in the backup role:

1. In an EX8200 Virtual Chassis, the devices in the primary and backup roles are always XRE200 External Routing Engines.

2. In all other Virtual Chassis, the devices in the primary and backup roles are switches.

You do not need additional license keys for Virtual Chassis member switches that are in the linecard role or for the redundant Routing Engine (RE) modules or the redundant Switch Fabric and Routing Engine (SRE) modules in an EX8200 member switch.

This topic describes:
Purchasing a Software Feature License

The following sections list features that require separate licenses. To purchase a software license, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). You will be asked to supply the chassis serial number of your switch; you can obtain the serial number by running the `show chassis hardware` command.

You are required to provide the 12-digit serial number when purchasing a license for an XRE200 External Routing Engine in an EX8200 Virtual Chassis.

The serial number listed on the XRE200 External Routing Engine serial ID label is 16 digits long. Use the last 12 digits of the 16-digit serial number to purchase the license.

You can use the `show chassis hardware` command output to display the 12-digit serial number of the XRE200 External Routing Engine.
License Key Components for the EX Series Switch

When you purchase a license for a Junos OS feature that requires a separate license, you receive a license key.

A license key consists of two parts:

1. License ID—Alphanumeric string that uniquely identifies the license key. When a license is generated, it is given a license ID.

2. License data—Block of binary data that defines and stores all license key objects.

For example, in the following typical license key, the string `Junos204558` is the license ID, and the trailing block of data is the license data:

```
XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxx
```

The license data defines the device ID for which the license is valid and the version of the license.

Features Requiring a License on EX2200 Switches

For EX2200 switches, the following features can be added to basic Junos OS by installing an enhanced feature license (EFL):

1. Bidirectional Forwarding Detection (BFD)

2. Connectivity fault management (IEEE 802.1ag)

3. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

4. OSPFv1/v2 (with four active interfaces)

5. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

6. Q-in-Q tunneling (IEEE 802.1ad)

7. Real-time performance monitoring (RPM)

8. Virtual Router

9. Virtual Router Redundancy Protocol (VRRP)

Table 88 lists the EFLs that you can purchase for EX2200 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX2200 switch.

Table 88 Junos OS Part Number on EX2200 Switches

Switch Model	Part Number
EX2200-C-12P-2G EX2200-C-12T-2G	EX-12-EFL

Switch Model	Part Number
EX2200-24T-4G EX2200-24P-4G EX2200-24T-DC-4G	EX-24-EFL
EX2200-48T-4G EX2200-48P-4G	EX-48-EFL

Features Requiring a License on EX2300 Switches

EX2300 switches have enhanced feature licenses (EFLs).

To use the following features on the EX2300 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. Filter-based forwarding (FBF)

3. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

4. IPv6 routing protocols: Multicast Listener Discovery version 1 and 2 (MLD v1/v2), OSPFv3, PIM multicast, VRRPv3

5. Multicast Source Discovery protocol (MSDP)

6. Operations Administration Management (OAM) (Connectivity Fault Management (CFM)

7. OSPF v2/v3

8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

9. Real-time performance monitoring (RPM)

10. RIPng (RIPng is for RIP IPv6)

11. Virtual Router Redundancy Protocol (VRRP)

Table 89 lists the EFLs that you can purchase for EX2300 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX2300 switch.

Table 89 Junos OS Part Number on EX2300 Switches

Switch Model	Part Number
EX2300-C-12P EX2300-C-12T	EX-12-EFL

Switch Model	Part Number
EX2300-24T EX2300-24P EX2300-24MP	EX-24-EFL
EX2300-48T EX2300-48P EX2300-48MP	EX-48-EFL

Virtual Chassis feature support on EX2300 switches:

1. The EX-12-EFL SKU includes the EX2300-VC (Virtual Chassis feature) license. EX2300-C-12P and EX2300-C-12T switches do not require an additional EX2300-VC license if you purchases the EFL license.

2. EX2300-24T, EX2300-24P, EX2300-24MP, EX2300-48T, EX2300-48P, and EX2300-48MP switches do not include the EX2300-VC (Virtual Chassis feature). If you want to use Virtual Chassis feature, you must purchase a separate EX2300-VC license for each EX2300 switch.

Features Requiring a License on EX3300 Switches

Two types of licenses are available on EX3300 switches: enhanced feature licenses (EFLs) and advanced feature licenses (AFLs).

To use the following features on the EX3300 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

3. IPv6 routing protocols: Multicast Listener Discovery version 1 and 2 (MLD v1/v2), OSPFv3, PIM multicast, VRRPv3, virtual router support for unicast and filter-based forwarding (FBF)

4. Intermediate System-to-Intermediate System (IS-IS)

5. OSPFv1/v2

6. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

7. Q-in-Q tunneling (IEEE 802.1ad)

8. Real-time performance monitoring (RPM)

9. Unicast reverse-path forwarding (RPF)

10. Virtual Router

11. Virtual Router Redundancy Protocol (VRRP)

Table 90 lists the EFLs that you can purchase for EX3300 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX3300 switch.

Table 90 Junos OS Part Number on EX3300 Switches

Switch Model	Part Number
EX3300-24T EX3300-24P EX3300-24T-DC	EX-24-EFL
EX3300-48T EX3300-48T-BF EX3300-48P	EX-48-EFL

To use the following feature on EX3300 switches, you must install an AFL:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. IPv6 routing protocols: IPv6 BGP and IPv6 for MBGP

3. Virtual routing and forwarding (VRF) BGP

Table 91 lists the AFLs that you can purchase for EX3300 switch models. For EX3300 switches, you must purchase and install a corresponding EFL along with the AFL to enable the advanced license features. If you have both these licenses, you can run all of the advanced software features mentioned above on your EX3300 switch.

Table 91 Junos OS AFL Part Number on EX3300 Switches

Switch Model	AFL Part Number
EX3300-24T EX3300-24P EX3300-24T-DC	EX-24-AFL
EX3300-48T EX3300-48T-BF EX3300-48P	EX-48-AFL

Features Requiring a License on EX3400 Switches

EX3400 switches has an enhanced feature licenses (EFLs) and MACSec license.

To use the following features on the EX3400 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. Filter-based forwarding (FBF)

3. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

4. IPv6 routing protocols: : Multicast Listener Discovery version 1 and 2 (MLD v1/v2), OSPFv3, PIM multicast, VRRPv3, virtual router support for unicast

5. Multicast Source Discovery Protocol (MSDP)

6. Operations Administration Management (OAM) (Connectivity Fault Management (CFM)

7. OSPF v2/v3

8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

9. Real-time performance monitoring (RPM)

10. RIPng (RIPng is for RIP IPv6)

11. Unicast reverse-path forwarding (RPF)

12. Virtual Router

13. Virtual Router Redundancy Protocol (VRRP)

Table 92 lists the EFLs that you can purchase for EX3400 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX3400 switch.

Table 92 Junos OS Part Number on EX3400 Switches

Switch Model	Part Number
EX3400-24T EX3400-24P	EX-24-EFL
EX3400-48P EX3400-48T EX3400-48T-AFI EX3400-48T-DC EX3400-48T-DC-AFI	EX-48-EFL

To use the following features on the EX3400 switches, you must install an AFL:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Intermediate System-to-Intermediate System (IS-IS)

Table 93 lists the AFLs that you can purchase for EX3400 switch models. For EX3400 switches, you must purchase and install a corresponding EFL along with the AFL to enable the advanced license

features. If you have both these licenses, you can run all of the advanced software features mentioned above on your EX3400 switch.

Table 93 Junos OS Part Number on EX3400 Switches

Switch Model	Part Number
EX3400-24T EX3400-24P	EX-24-AFL
EX3400-48P EX3400-48T EX3400-48T-AFI EX3400-48T-DC EX3400-48T-DC-AFI	EX-48-AFL

You must download a MACsec feature license to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX3400 switches.

Table 94 lists the MACsec model number that you can purchase for EX3400 switch models.

Table 94 Junos OS MACsec model number on EX3400 Switches

Switch Model	Model Number
EX3400	EX-QFX-MACSEC-ACC

Features Requiring a License on EX4300 Switches

Two types of licenses are available on EX4300 switches: enhanced feature licenses (EFLs) and advanced feature licenses (AFLs).

To use the following features on the EX4300 switches, you must install an EFL:

1. Bidirectional Forwarding Detection (BFD)

2. Connectivity fault management (IEEE 802.1ag)

3. Filter-based forwarding (FBF)

4. IGMP (Internet Group Management Protocol) version 1 (IGMPv1), IGMPv2, and IGMPv3

5. Multicast Source Discovery Protocol (MSDP)

6. Operations Administration Management (OAM) (Connectivity Fault Management (CFM))

7. OSPFv2/v3

8. Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

9. Real-time perfomance monitoring (RPM)

10. RIPng (RIPng is for RIP IPv6)

11. Unicast reverse-path forwarding (RPF)

12. Virtual Router

13. Virtual Router Redundancy Protocol (VRRP)

Table 95 lists the EFLs that you can purchase for EX4300 switch models. If you have the license, you can run all of the enhanced software features mentioned above on your EX4300 switch.

Table 95 Junos OS Part Number on EX4300 Switches

Switch Model	Part Number
EX4300-24T EX4300-24P	EX4300-24-EFL
EX4300-48MP EX4300-48P EX4300-48T EX4300-48T-AFI EX4300-48T-DC EX4300-48T-DC-AFI	EX4300-48-EFL
EX4300-32F EX4300-32F-DC	EX4300-32F-EFL

To use the following features on EX4300 switches, you must install an AFL:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Intermediate System-to-Intermediate System (IS-IS)

3. Ethernet VPN (EVPN) with Virtual Extensible LAN (VXLAN)
   - Supported only on EX4300-48MP switch.
   - Requires the Border Gateway Protocol (BGP) for configuration.

Table 96 lists the AFLs that you can purchase for EX4300 switch models. For EX4300 switches, you must purchase and install a corresponding EFL along with the AFL to enable the advanced license features. If you have both these licenses, you can run all of the advanced software features mentioned above on your EX4300 switch.

Table 96 Junos OS AFL Part Number on EX4300 Switches

Switch Model	AFL Part Number
EX4300-24T EX4300-24P	EX4300-24-AFL
EX4300-48MP EX4300-48P EX4300-48T EX4300-48T-AFI EX4300-48T-DC EX4300-48T-DC-AFI	EX4300-48-AFL
EX4300-32F EX4300-32F-DC	EX4300-32F-AFL

You must download a MACsec feature license (Part Number-EX-QFX-MACSEC- ACC) to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX4300 switches.

Table 97 lists the MACsec model number that you can purchase for EX4300 switch models.

Table 97 Junos OS MACsec model number on EX4300 Switches

Switch Model	Model Number
EX4300	EX-QFX-MACSEC-ACC

Features Requiring a License on EX4600 Switches

To use the following features on EX4600 switches, you must install an advanced feature license:

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Intermediate System-to-Intermediate System (IS-IS)

3. Multiprotocol Label Switching (MPLS)

4. Virtual Extensible LAN (VXLAN)

Table 98 lists the AFLs that you can purchase for EX4600 switch models.

Table 98 Junos OS AFL Part Number on EX4600 Switches

Switch Model	AFL Part Number
EX4600-40F	EX4600-AFL

You must download a MACsec feature license to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX4600 switches.

Table 99 lists the MACsec model number that you can purchase for EX4600 switch models.

Table 99 Junos OS AFL Part Number on EX4600 Switches

Switch Model	Model Number
EX4600-40F	EX-QFX-MACSEC-AGG

Features Requiring a License on EX4650 Switches

Table 100 lists the PFLs and AFLs that you can purchase for EX4650 switch models. If you have the license, you can run all of the premium and advanced software features mentioned below on your EX4650 switch.

Table 100 Junos OS Part Numbers on EX4650 Switches

Switch Model	License Type	Part Number
EX4650-48Y	Premium	EX4650-PFL

Switch Model	License Type	Part Number
EX4650-48Y	Advanced	EX4650-AFL

Table 101 lists the standard Junos OS features which require licenses on EX4650 switches.
Table 101 Features which Require Licenses on EX4650 Switches

License Model	Detailed Features
Base Features	Basic IPv6, BFD, CFM (IEEE 802.1ag), Class of service (COS)/ Policing/Shaping/Marking, Filtering, IGMPv1/v2/v3 (includes IGMP Snooping), Junos Telemetry Interface, MC-LAG, MLDv1/v2 and MSDP, OSPFv2 and OSPFv3, PIM-DM/SM/SSM and PIMv6, Q-in-Q tunneling (IEEE 802.1ad), RIPng and RPM, Timing – Boundary Clock and Timing – Transparent Clock, Unicast reverse-path forwarding (RPF), VC, Virtual Router, VRRP, and VRRPv6, Zero Touch Provisioning (ZTP)
Premium Features	Includes all base features, BGP and MBGP, Ethernet VPN, IPv6 for BGP or MGBP, IS-IS or IPv4 and IPv6, VRF, VXLAN
Advanced Features	Includes all PFL features, MPLS, MPLS based Circuit cross-connect (CCC), Resource Reservation Protocol (RSVP) label-switched path (LSP), Segment Routing.
	MACsec is not supported on EX4650 switch.

Features Requiring a License on EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, EX9200 and EX9250 Switches

To use the following features on EX3200, EX4200, EX4500, EX4550, EX8200, EX9200 and EX9250 switches, you must install an advanced feature license (AFL):

1. Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

2. Ethernet VPN (available only on EX9200 and EX9250 switches)

3. Intermediate System-to-Intermediate System (IS-IS)

4. IPv6 routing protocols: IS-IS for IPv6, IPv6 BGP, IPv6 for MBGP

5. Logical systems (available only on EX9200 switches)

6. MPLS with RSVP-based label-switched paths (LSPs)

   Starting with Junos OS Release 17.3R1, you can enable up to 200 RSVP-TE sessions in the EX9200 advanced feature license (AFL).

7. MPLS-based circuit cross-connects (CCCs) (available only on EX4200 and EX4550 switches)

8. Open vSwitch Database (OVSDB) (available only on EX9200 switches)

9. Virtual Extensible LAN (VXLAN) (available only on EX9200 and EX9250 switches)

To use the following features on Juniper Networks EX6200 Ethernet Switches, you must install an advanced feature license (AFL):

1. Border Gateway Protocol (BGP)

2. Intermediate System-to-Intermediate System (IS-IS)

3. IPv6 routing protocols: IS-IS for IPv6, IPv6 BGP

To use MACsec feature on Juniper Networks EX9253 Switches, you must install an security feature license (SFL).

To use Forwarding Information Base (FIB) and Address Resolution Protocol (ARP) features on Juniper Networks EX9251 and EX9253 Switches, you must install an mid-scale license (ML).

Table 102 lists the AFLs that you can purchase for EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, EX9200 and EX9250 switches. If you have the license, you can run all of the advanced software features mentioned above on your EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, or EX9200 switch. An EFL is not applicable to this range of switches.

Table 102 Junos OS AFL Part Number on EX3200, EX4200, EX4500, EX4550, EX6200, EX8200, EX9200 and EX9250 Switches

Switch Model	AFL Part Number
EX3200-24P EX3200-24T EX4200-24F EX4200-24P EX4200-24PX EX4200-24T	EX-24-AFL
EX3200-48P EX3200-48T EX4200-48F EX4200-48P EX4200-48PX EX4200-48T	EX-48-AFL
EX4500-40F-BF EX4500-40F-BF-C EX4500-40F-FB EX4500-40F-FB-C	EX-48-AFL
EX4550	EX4550-AFL
EX6210	EX6210-AFL

Switch Model	AFL Part Number
EX8208	EX8208-AFL
EX8216	EX8216-AFL
EX-XRE200	EX-XRE200-AFL
EX9204	EX9204-AFL
EX9208	EX9208-AFL
EX9214	EX9214-AFL
EX9251	EX9251-AFL EX9251-ML
EX9253	EX9253-AFL EX9253-ML EX9253-SFL

You must download a MACsec feature license to enable MACsec. The MACsec feature license is an independent feature license; the enhanced feature licenses (EFLs) or advanced feature licenses (AFLs) that must be purchased to enable some features on EX Series switches cannot be purchased to enable MACsec.

To purchase a feature license for MACsec, contact your Juniper Networks sales representative (https://www.juniper.net/us/en/contact-us/sales-offices). The Juniper sales representative will provide you with a feature license file and a license key.

MACsec is supported on EX4200 and EX4550 switches.

Table 103 lists the MACsec model number that you can purchase for EX4200 and EX4550 switch models.

Table 103 Junos OS MACsec model number on EX4200 and EX4550 Switches

Switch Model	Model Number
EX4550	EX-QFX-MACSEC-AGG
EX4200	EX-QFX-MACSEC-ACC

Software Features That Require Licenses on EX Series Switches

The following Junos OS features require an Enhanced Feature License (EFL) or Advanced Feature License (AFL) on EX Series devices:

1. (EX2200 only) Bidirectional forwarding detection (BFD)

2. (EX2200 only) Connectivity fault management (IEEE 802.lag)

3. (EX2200 only) Internet Group Management Protocol version 1 (IGMPv1), IGMPv2, and IGMPv3

4. (EX2200 and EX3300) OSPFv1/v2 (with 4 active interfaces)

5. (EX2200 only) Protocol Independent Multicast (PIM) dense mode, PIM source-specific mode, PIM sparse mode

6. (EX2200 and EX3300) Q-in-Q tunneling (IEEE 802.lad)

7. (EX2200 only) Real-time performance monitoring (RPM)

8. (EX3200, EX4200, EX4500, EX6200, and EX8200) Border Gateway Protocol (BGP) and multiprotocol BGP (MBGP)

9. (EX3200, EX4200, EX4500, EX6200, and EX8200) Intermediate System-to-Intermediate System (IS-IS)

10. (EX3200, EX4200, EX4500, EX6200, and EX8200) IPv6 protocols: OSPFv3, PIPng, IS-IS for IPv6, IPv6 BGP

11. (EX3200, EX4200, EX4500, EX6200, and EX8200) MPLS with RSVP-based label-switched paths (LSPs) and MPLS-based circuit cross-connects (CCCs)

For more details regarding EX Series feature licenses, see *Understanding Software Licenses for EX Series Switches*.

For information about how to purchase a software license, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

License Key Components for the EX Series Switch

When you purchase a license for a Junos OS feature that requires a separate license, you receive a license key.

A license key consists of two parts:

1. License ID—Alphanumeric string that uniquely identifies the license key. When a license is generated, it is given a license ID.

2. License data—Block of binary data that defines and stores all license key objects.

For example, in the following typical license key, the string `Junos204558` is the license ID, and the trailing block of data is the license data:

```
XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxx
```

The license data defines the device ID for which the license is valid and the version of the license.

Legacy Licenses for QFX Series

Software Features That Require Licenses on the QFX Series

The standard Junos OS software shipped on the hardware platform for QFX Series switches except the QFX5200-32C, includes a perpetual base license. This license is valid for the life of the hardware platform.

You must purchase the perpetual base license on the disaggregated Junos OS feature licenses on the QFX5200-32C, see Licenses for QFX5200-32C Switch.

For information regarding newer subscription based licenses, including platforms supported, see Flex Software License for QFX Series Switches.

For information about how to purchase any software license, contact your Juniper Networks sales representative, or an approved Juniper Partner.

Table 104 lists Junos OS features supported on QFX switches.

Table 104 Software Features which Require Licenses on QFX5100, QFX5110-48S-AFI/AFO (DC), QFX5110-32Q-AFI/AFO (DC), QFX5120, QFX5210-64C and QFX10000 line of switches.

Base Features	Premium Features	Advanced Features
Basic IPv6	BGP	MPLS
BFD	Ethernet VPN	MPLS-based CCC
CFM (IEEE 802.1ag)	IPv6 for BGP/MBGP	RSVP-based LSP
Class of service (COS)/Policing/Shaping/Marking	IS-IS	Segment Routing
Filtering	IS-IS for IPv6	
IGMPv1/v2/v3 (includes IGMP Snooping)	MBGP	
Junos Telemetry Interface	OVSDB	
MC-LAG	VRF(BGP)	
MLDv1/v2	VXLAN	
OSPFv2		
OSPFv3		
PIM-DM/SM/SSM		

Base Features	Premium Features	Advanced Features
PIMv6		
Q-in-Q tunneling (IEEE 802.1ad)		
RIPng		
RPM		
PTP – Boundary Clock		
PTP – Transparent Clock		
Unicast reverse-path forwarding(RPF)		
Virtual Chassis (VC) Applicable also for QFX5200-48Y switches.		
Virtual Router		
VRRP		
VRRPv6		
Zero Touch Provisioning (ZTP)		

Table 105 lists the Junos OS features supported on QFX switches.

Table 105 Software Features which Require Licenses on QFX5200-48Y and QFX5200-32C-L switches.

Base Features	Premium Features	Advanced Features
Basic IPv6	BGP	MPLS
BFD	Ethernet VPN	MPLS-based CCC
CFM (IEEE 802.1ag)	IPv6 for BGP/MBGP	RSVP-based LSP
Class of service (COS)/Policing/Shaping/Marking	IS-IS	Segment Routing
Filtering	IS-IS for IPv6	
IGMPv1/v2/v3 (includes IGMP Snooping)	MBGP	

Base Features	Premium Features	Advanced Features
Junos Telemetry Interface	OVSDB	
MLDv1/v2	MC-LAG	
OSPFv2	VXLAN	
OSPFv3	Virtual Chassis (VC) Except for QFX5200-48Y switches.	
PIM-DM/SM/SSM		
PIMv6		
Q-in-Q tunneling (IEEE 802.1ad)		
RIPng		
RPM		
PTP – Boundary Clock		
PTP – Transparent Clock		
Unicast reverse-path forwarding(RPF)		
Virtual Router		
VRRP		
VRRPv6		
Zero Touch Provisioning (ZTP)		

1. If you try to configure a feature that is not licensed, you will receive syslog messages saying that you are using a feature that is licensable and that you do not possess a license for the feature. If you try to commit configuration changes for a feature that is not licensed, you will receive a commit warning saying that you have exceeded the allowed license limit for the feature. The feature will commit and be usable but this action violates EULA agreement.

2. On QFX5100 and QFX5110, there is no separate license for Virtual Chassis like there is for Virtual Chassis Fabric.

3. Premium Feature Licenses (PFL) include the Base License Features. Advanced Feature Licenses (AFL) include the Base and Premium License Features.

Table 106 describes the licenses required for QFX series switches:

Table 106 Licenses Required for QFX Series Switches

License	Description	Number of Licenses Required	QFX Devices Supported
Base	Features included with the switch - No License required	-	-
QFX-JSL-EDGE-ADV1	QFX Series Edge Advanced Feature License	One per switch, two per Virtual Chassis, and two per Virtual Chassis Fabric	QFX3500, QFX3600, QFX5100-48S, QFX5100-48T
QFX5100-HDNSE-LIC	QFX5100-24Q and QFX5100-96S Advanced Feature License	One per switch, two per Virtual Chassis, and two per Virtual Chassis Fabric	QFX5100-24Q , QFX5100-96S
QFX5K-C2-PFL	QFX5000 Class 2 Premium Feature License	One per switch	QFX5210-64C
QFX5K-C2-AFL	QFX5000 Class 2 Advanced Feature License	One per switch	QFX5210-64C
QFX-JSL-EDGE-FC	QFX Series Edge feature license for Fibre Channel	One per switch on which fibre channel ports are configured	QFX3500
EX-QFX-MACSEC-AGG	QFX and EX Series feature license for enabling Media Access Control security (MACsec).	One per switch, two per Virtual Chassis	QFX switches that support MACsec
QFX10000-30C-LFIB	1 Million (v4 or v6) Forwarding Information Base (FIB) entries license	One per line card	QFX10000-30C, QFX10000-30C-M line cards
QFX10000-36Q-LFIB	1 Million (v4 or v6) Forwarding Information Base (FIB) entries license	One per line card	QFX10000-36Q, QFX10K-12C-DWDM line cards

License	Description	Number of Licenses Required	QFX Devices Supported
QFX10000-60S-LFIB	1 Million (v4 or v6) Forwarding Information Base (FIB) entires license	One per line card	QFX10000-60S-6Q line card
QFX10002-36Q-LFIB	1 Million (v4 or v6) Forwarding Information Base (FIB) entries license	One per switch	QFX10002 36-port 40GbE QSFP+/12-port 100GbE QSFP28 switch
QFX10002-60C-LFIB	1 Million (v4 or v6) Forwarding Information Base (FIB) entries license	One per switch	QFX10002-60C
QFX10002-72Q-LFIB	1 Million (v4 or v6) Forwarding Information Base (FIB) entries license	One per switch	QFX10002-72Q

Generating License Keys

Before generating the license keys for a device:

1. Purchase the required licenses for the device. See *Software Features That Require Licenses on the QFX Series* and Licenses for QFX5200-32C Switch.

2. Note down the authorization code in the e-mail you received from Juniper Networks when you purchased the license. Determine the serial number of the device. For instructions, see Download and Activate Your Software

When you purchase a Junos OS software feature license for a device, you receive an e-mail containing an authorization code for the feature license from Juniper Networks. You can use the authorization code to generate a unique license key (a combination of the authorization code and the device's serial number) for the device, and then add the license key on the device.

To generate the license keys for a device:

This procedure shows you how to generate license keys on a QFX Series device, but you can follow the same procedure for any device.

1. In a browser, log in to the Juniper Networks License Management System at https://www.juniper.net/lcrs/license.do.
    The Manage Product Licenses page appears.

    To access the licensing site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website

https://www.juniper.net/registration/Register.jsp .

2. On the Generate Licenses tab, select **QFX Series Product** from the drop-down list, and click **Go**.

   The Generate Licenses - QFX Series Product page appears.

3. In the **Device Serial Number** field, enter the serial number for the device.

4. In the **Authorization Code** field, enter the authorization code in the e-mail you received from Juniper Networks when you purchased the license.

5. (Optional) If you want to enter another authorization code for the same device, click **Enter More Authorization Codes** to display a new authorization code field. Enter the authorization code in this field.

6. Click **Confirm**.

   The Confirm License Information page appears, displaying a summary of the information you submitted to the License Management System.

7. Review the information to ensure everything is correct and then click **Generate License**.

   The Generate Licenses - QFX Series Product Devices page appears, displaying a summary of your license keys, including a link that displays the details of your new license keys.

8. Select the file format in which you want to obtain your new license keys.

9. Select the delivery method you want to use to obtain your new license keys.

   To download the license keys:
   - Select the **Download to this computer** option button, and click **OK**.

   To e-mail the license keys:

   - Select the **Send e-mail to *e-mail ID*** option button, and click **OK**.

Generating the License Keys for a QFabric System

Before generating the license keys for a QFabric system:

1. Purchase the required licenses for the QFabric system. See *Software Features That Require Licenses on the QFX Series*.

2. Note down the authorization code in the e-mail you received from Juniper Networks when you purchased the license.

3. Perform the initial setup of the QFabric system on the Director group. See *Performing the QFabric System Initial Setup on a QFX3100 Director Group*.

4. Log in to the QFabric system, issue the `show version` command, and note down the software serial number and QFabric system ID for the QFabric system.

```
user@qfabric> show version
Hostname: qfabric
Model: qfx3000-g
Serial Number: qfsn-0123456789
QFabric System ID: f158527a-f99e-11e0-9fbd-00e081c57cda
JUNOS Base Version [12.2I20111018_0215_dc-builder]
```

When you purchase a Junos OS software feature license for a QFabric system, you receive an e-mail containing an authorization code for the feature license from Juniper Networks. You can use the authorization code to generate a unique license key (a combination of the authorization code and the QFabric system ID) for the QFabric system, and then add the license key on the QFabric system.

To generate the license keys for a QFabric system:

1. In a browser, log in to the license portal.

    The products supported by the Juniper Agile Licensing (JAL) portal includes: QFX series, SRX Series, EX Series, NFX, vBNG, vMX, vSRX, and ACX. For other Juniper products (SPACE, JSA, SBR Carrier, Screen OS and so on) access the License Management System (LMS).

    The Manage Product Licenses page appears.

    To access the licensing site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website
    https://www.juniper.net/registration/Register.jsp .

2. On the Generate Licenses tab, select **QFX Series Product** from the drop-down list, and click **Go**.
    The Generate Licenses - QFX Series Product page appears.

3. Select the **QFX Series Product Fabric** option button, and then click **Continue**.
    The Generate Licenses - QFX Series Product Fabrics page appears.

4. In the **Software Serial No** field, enter the software serial number for the QFabric system.

5. In the **QFabric System ID** field, enter the QFabric system ID for the QFabric system.

6. In the **Authorization Code** field, enter the authorization code in the e-mail you received from Juniper Networks when you purchased the license.

7. (Optional) If you want to enter another authorization code for the same device, click **Enter More Authorization Codes** to display a new authorization code field. Enter the authorization code in this field.

8. Click **Confirm**.

    The Confirm License Information page appears, displaying a summary of the information you submitted to the license portal.

9. Review the information to ensure everything is correct and then click **Generate License**.

   The Generate Licenses - QFX Series Product Fabrics page appears, displaying a summary of your license keys, including a link that displays the details of your new license keys.

10. Select the file format in which you want to obtain your new license keys.

11. Select the delivery method you want to use to obtain your new license keys.

    To download the license keys:

    1. Select the **Download to this computer** option button, and click **OK**.

    To e-mail the license keys:

    1. Select the **Send e-mail to** *e-mail ID* option button, and click **OK**.

Understanding Junos Fusion Licenses

New deployments for Multichassis link aggregation groups (MC-LAG) or Ethernet VPN (EVPN) based Junos Fusion Data Center are not recommended.

Starting with Junos OS Release 17.2R1, you need to install a Junos Fusion license in addition to any other feature licenses that you install to track and activate certain QFX5100-48SH and QFX5100-48TH models that are shipped with satellite software. These models can only be used as satellite devices. For these models, you need to install a Junos Fusion license in addition to any other feature licenses that you install. See Table 107 for a list of satellite devices that require Junos Fusion licenses.

You do not need Junos Fusion licenses for satellite device models that were purchased as Junos OS-based top-of-rack switches.

Install the Junos Fusion licenses on the aggregation device because the aggregation device is the single point of management in a Junos Fusion. If your Junos Fusion is operating in a topology with multiple aggregation devices, you only need to install the licenses on one aggregation device because the license keys are synchronized between the two aggregation devices.

You can install a single-pack license to activate one satellite device, or you can install multi-pack licenses, which can activate up to 128 satellite devices. If the number of satellite devices in a Junos Fusion exceeds the number of Junos Fusion licenses you have installed, the satellite devices are provisioned, but the system will issue a warning saying that there is a license limit violation. If the satellite device does not have a corresponding Junos Fusion license installed, the satellite device is provisioned, but the system will issue a warning.

Table 107 lists the supported aggregation and satellite devices as well as the model numbers of the Junos Fusion license packs.

For information about how to purchase a software license, contact your Juniper Networks sales representative. For information on standard Junos OS feature licenses, see *Software Features That Require Licenses on the QFX Series*.

Table 107 Junos Fusion License Model Numbers for Satellite Devices

Aggregation Devices Supported	Satellite Devices Requiring Licenses	Model Numbers of License Packs
QFX10002, QFX10008 and QFX10016 switches	1. QFX5100-48SH-AFO 2. QFX5100-48SH-AFI 3. QFX5100-48TH-AFO 4. QFX5100-48TH-AFI	QFX10K-C1-JFS-1 QFX10K-C1-JFS-4 QFX10K-C1-JFS-8 QFX10K-C1-JFS-16 QFX10K-C1-JFS-32 QFX10K-C1-JFS-64

Legacy Licenses for QFX5200-32C Switch

Disaggregated Software Features That Require Licenses on the QFX Series
Disaggregated Software Feature Licenses on QFX5200 Switches

The disaggregated software feature licenses are only applicable for QFX5200-32C devices. For QFX5200-48Y devices, the base software features are included with the device. Additional licenses are required only for premium and advanced features.

The Junos OS software is disaggregated from the hardware. With disaggregated Junos OS, you can purchase the following feature licenses, which are available on a perpetual basis:

1. Junos Base Software (JBS) license:

   Includes basic layer 2 switching, basic layer 3 routing, multicast, automation, programmability, Zero Touch Provisioning (ZTP) and basic monitoring.

   You must purchase the JBS license to use basic functions, but you do not need to install the license key in Junos OS Release 15.1X53-D30. JBS basic functions work with this release without installing the license key. However, you will need to install the license key in a future release of Junos OS to be determined, so make sure to retain the authorization code you received from the license portal to generate a license key for the JBS license. If the license is not installed, system triggers the log messages.

   The products supported by the Juniper Agile Licensing (JAL) portal includes: QFX series, SRX Series, EX Series, NFX, vBNG, vMX, vSRX, and ACX. For other Juniper products (SPACE, JSA, SBR Carrier, Screen OS and so on) access the License Management System (LMS).

2. Junos Advanced Software (JAS) license:

   Includes features supported in JBS license and Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), and Virtual Extensible Local Area Network (VXLAN). You need to install the license key to use these features.

3. Junos Premium Software (JPS) license:

   Includes features supported in JAS license and Multi-protocol Label Switching (MPLS) feature set. You need to install the license key to use these features.

For information about how to purchase a software feature license, contact your Juniper Networks sales representative.

Table 108 Disaggregated Junos OS Feature Licenses and Associated SKU's

Licence SKU	Description	Number of Licenses Required	QFX Devices Supported
QFX5000-35-JBS	Junos base software (JBS) license	One per switch	QFX5200-32C

Software Features That Require Licenses on the QFX5200-32C Switch

The standard Junos OS software shipped on the hardware platform for QFX5200-32C switch does not includes a perpetual base license.

You must purchase the perpetual base license on the disaggregated Junos OS feature licenses on the QFX5200-32C. This license is valid for the life of the hardware platform.

For information about how to purchase any software license, contact your Juniper Networks sales representative, or an approved Juniper Partner.

Table 109 lists the Junos OS features which require licenses on QFX5200-32C switch.

Table 109 Software Features which Require Licenses on QFX5200-32C switch.

Junos base software (JBS) license	Junos advanced software (JAS) license	Junos premium software (JPS) license
Basic IPv6	BGP	MPLS
BFD	Ethernet VPN	MPLS-based CCC
CFM (IEEE 802.1ag)	IPv6 for BGP/MBGP	RSVP-based LSP
Class of service (COS)/Policing/Shaping/Marking	IS-IS	Segment Routing
Filtering	IS-IS for IPv6	
IGMPv1/v2/v3 (includes IGMP Snooping)	MBGP	
Junos Telemetry Interface	OVSDB	
MC-LAG	VRF(BGP)	
MLDv1/v2	VXLAN	
OSPFv2		
OSPFv3		
PIM-DM/SM/SSM		

Junos base software (JBS) license	Junos advanced software (JAS) license	Junos premium software (JPS) license
PIMv6		
Q-in-Q tunneling (IEEE 802.1ad)		
RIPng		
RPM		
PTP – Boundary Clock		
PTP – Transparent Clock		
Unicast reverse-path forwarding(RPF)		
Virtual Chassis (VC)		
Virtual Router		
VRRP		
VRRPv6		
Zero Touch Provisioning (ZTP)		

If you try to configure a feature that is not licensed, you will receive syslog messages saying that you are using a feature that is licensable and that you do not possess a license for the feature. If you try to commit configuration changes for a feature that is not licensed, you will receive a commit warning saying that you have exceeded the allowed license limit for the feature. The feature will commit and be usable but this action violates EULA agreement.

Premium Feature Licenses (PFL) include the Base License Features. Advanced Feature Licenses (AFL) include the Base and Premium License Features.

Table 110 describes SKUs for QFX5200-32C switch.

Table 110 QFX5200-32C switch SKUs

Licensed Software Features	SKU's
Junos base software (JBS) license	QFX5000-35-JBS

Licenses for Security Devices

Licenses for Juniper Secure Connect

Juniper Secure Connect is Juniper's client-based SSL-VPN solution. It provides secure connectivity to your protected resources and protects the client from security threats in the network. For more information on how to install and configure, see Juniper Secure Connect Administrator Guide.

You can avail 1 year, 3 year, or 5 year subscription licenses for Juniper Secure Connect. SRX Series devices and vSRX include two built-in concurrent user/devices licenses.

You need new license keys to activate additional concurrent user/devices than the two built-in concurrent user licenses on SRX Series devices and vSRX. Contact your Juniper Account Team or Juniper Partner for purchasing additional license.

Table 111 shows definition of Juniper Secure Connect remote access VPN license SKUs.

Table 111 Juniper Secure Connect Remote Access VPN License SKUs Definition

License SKU	SKU Character Description
S-RA3-SRX3*XX*-S-*1/3/5*	S—Subscription RA3—Juniper Secure Connect SRX3*XX*—SRX300 line of devices (only supported on SRX300 line of devices) S—Standard software subscription *1/3/5*—Subscription term 1 or 3 or 5 years
S-RA3-*X*CCU-S-*1/3/5*	S—Subscription RA3—Juniper Secure Connect *X*CCU—*X* is the number of total connected concurrent users (supported on SRX Series devices and vSRX) S—Standard software subscription *1/3/5*—Subscription term 1 or 3 or s years

Table 112 describes remote access VPN license SKUs for Juniper Secure Connect on SRX Series devices and vSRX.

Table 112 Remote Access VPN License SKUs for Juniper Secure Connect

Supported Devices	License SKUs	Description
SRX300	S-RA3-SRX300-S-1 S-RA3-SRX300-S-3 S-RA3-SRX300-S-5	25 Concurrent users with software support
SRX320	S-RA3-SRX320-S-1 S-RA3-SRX320-S-3 S-RA3-SRX320-S-5	50 Concurrent users with software support
SRX340	S-RA3-SRX340-S-1 S-RA3-SRX340-S-3 S-RA3-SRX340-S-5	150 Concurrent users with software support
SRX345	S-RA3-SRX345-S-1 S-RA3-SRX345-S-3 S-RA3-SRX345-S-5	250 Concurrent users with software support
SRX380	S-RA3-SRX380-S-1 S-RA3-SRX380-S-3 S-RA3-SRX380-S-5	500 Concurrent users with software support
SRX300, SRX320, SRX340, SRX345, SRX380, SRX550HM, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, SRX5800, and vSRX	S-RA3-5CCU-S-1 S-RA3-5CCU-S-3 S-RA3-5CCU-S-5	5 Concurrent users with software support
SRX300, SRX320, SRX340, SRX345, SRX380, SRX550HM, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, SRX5800, and vSRX	S-RA3-25CCU-S-1 S-RA3-25CCU-S-3 S-RA3-25CCU-S-5	25 Concurrent users with software support
SRX320, SRX340, SRX345, SRX380, SRX550HM, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, SRX5800, and vSRX	S-RA3-50CCU-S-1 S-RA3-50CCU-S-3 S-RA3-50CCU-S-5	50 Concurrent users with software support
SRX340, SRX345, SRX380, SRX550HM, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, SRX5800, and vSRX	S-RA3-100CCU-S-1 S-RA3-100CCU-S-3 S-RA3-100CCU-S-5	100 Concurrent users with software support

Supported Devices	License SKUs	Description
SRX345, SRX380, SRX550HM, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, SRX5800, and vSRX	S-RA3-250CCU-S-1 S-RA3-250CCU-S-3 S-RA3-250CCU-S-5	250 Concurrent users with software support
SRX380, SRX550HM, SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, SRX5800, and vSRX	S-RA3-500CCU-S-1 S-RA3-500CCU-S-3 S-RA3-500CCU-S-5	500 Concurrent users with software support
SRX1500, SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, and SRX5800	S-RA3-1KCCU-S-1 S-RA3-1KCCU-S-3 S-RA3-1KCCU-S-5	1000 Concurrent users with software support
SRX4100, SRX4200, SRX4600, SRX5400, SRX5600, and SRX5800	S-RA3-5KCCU-S-1 S-RA3-5KCCU-S-3 S-RA3-5KCCU-S-5	5000 Concurrent users with software support

Licenses for SRX Series

Software Feature Licenses for SRX Series Devices

Each feature license is tied to exactly one software feature, and the license is valid for one device. You can use the license to activate the specified advanced software features on a single device. Platform support depends on the Junos OS release in your installation.

We have simplified the ordering and application of SRX Series software feature licenses in flex license model. You can purchase many of the individual features as a bundle based on use case. For more information, see Flex Software License for SRX Series Devices.

> **Note**: To understand more about Junos OS Software Licensing, see the Juniper Licensing Guide. Please refer to the product Data Sheets accessible from Products & Services for details, or contact your Juniper Account Team or Juniper Partner.
>
> ATP Cloud, SecIntel, and Enhanced Web Filtering individual license are available. This is not a complete list of licenses. For the most up-to-date license models available, contact your Juniper Networks representative for license information.

Features Requiring a License on SRX300 Devices

Table 113 lists the licenses you can purchase for each SRX Series software feature.

Table 113 SRX300 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX300
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX300

Features Requiring a License on SRX320 Devices

Table 114 lists the licenses you can purchase for each SRX Series software feature.

Table 114 SRX320 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX320
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX320

Features Requiring a License on SRX340 Devices

Table 115 lists the licenses you can purchase for each SRX Series software feature.

Table 115 SRX340 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX340
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX340
Sky Advanced Threat Prevention (1 year, 3 years and 5 years subscription)	SRX340
SecIntel	SRX340

Features Requiring a License on SRX345 Devices

Table 116 lists the licenses you can purchase for each SRX Series software feature.

Table 116 SRX345 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX345
Intrusion Prevention Signature (1 year, 3 years and 5 years subscription)	SRX345
Sky Advanced Threat Prevention (1 year, 3 years and 5 years subscription)	SRX345
SecIntel	SRX345

Features Requiring a License on SRX1500 Devices

Table 117 lists the licenses you can purchase for each SRX Series software feature.

Table 117 SRX1500 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX1500
Intrusion Prevention Signature (1 year, 3 years and 5 years subscription)	SRX1500
Logical System License (1, 5, and 25 Incremental)	SRX1500
Remote Access (5 Concurrent users, NCP)	SRX1500
Remote Access (10 Concurrent users, NCP)	SRX1500
Remote Access (25 Concurrent users, NCP)	SRX1500
Remote Access (50 Concurrent users, NCP)	SRX1500

Licensed Software Feature	Supported Devices
Remote Access (100 Concurrent users, NCP)	SRX1500
Remote Access (150 Concurrent users, NCP)	SRX1500
Remote Access (250 Concurrent users, NCP)	SRX1500
Remote Access (500 Concurrent users, NCP)	SRX1500
Remote Access (1000 Concurrent users, NCP)	SRX1500
Remote Access (2000 Concurrent users, NCP)	SRX1500
SecIntel	SRX1500
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX1500

Features Requiring a License on SRX4100 Devices

Table 118 lists the licenses you can purchase for each SRX Series software feature.

Table 118 SRX4100 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced performance (upgrade to firewall IMIX performance up to 20G IMIX to the base 20G IMIX firewall throughput supported and application security)	SRX4100
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX4100
Intrusion Prevention Signature (1 year, 3 years and 5 years subscription)	SRX4100
Logical System License (1, 5, and 25 Incremental)	SRX4100
Remote Access (5 Concurrent users, NCP)	SRX4100
Remote Access (10 Concurrent users, NCP)	SRX4100
Remote Access (25 Concurrent users, NCP)	SRX4100
Remote Access (50 Concurrent users, NCP)	SRX4100
Remote Access (100 Concurrent users, NCP)	SRX4100
Remote Access (150 Concurrent users, NCP)	SRX4100

Licensed Software Feature	Supported Devices
Remote Access (250 Concurrent users, NCP)	SRX4100
Remote Access (500 Concurrent users, NCP)	SRX4100
Remote Access (1000 Concurrent users, NCP)	SRX4100
Remote Access (2000 Concurrent users, NCP)	SRX4100
Remote Access (5000 Concurrent users, NCP)	SRX4100
SecIntel	SRX4100
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX4100

Features Requiring a License on SRX4200 Devices

Table 119 lists the licenses you can purchase for each SRX Series software feature.

Table 119 SRX4200 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX4200
Intrusion Prevention Signature (1 year, 3 years and 5 years subscription)	SRX4200
Logical System License (1, 5, and 25 Incremental)	SRX4200
Remote Access (5 Concurrent users, NCP)	SRX4200
Remote Access (10 Concurrent users, NCP)	SRX4200
Remote Access (25 Concurrent users, NCP)	SRX4200
Remote Access (50 Concurrent users, NCP)	SRX4200
Remote Access (100 Concurrent users, NCP)	SRX4200
Remote Access (150 Concurrent users, NCP)	SRX4200
Remote Access (250 Concurrent users, NCP)	SRX4200
Remote Access (500 Concurrent users, NCP)	SRX4200

Licensed Software Feature	Supported Devices
Remote Access (1000 Concurrent users, NCP)	SRX4200
Remote Access (2000 Concurrent users, NCP)	SRX4200
Remote Access (5000 Concurrent users, NCP)	SRX4200
SecIntel	SRX4200
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX4200

Features Requiring a License on SRX4600 Devices

Table 120 lists the licenses you can purchase for each SRX Series software feature.

Table 120 SRX4600 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX4600
Intrusion Prevention Signature (1 year, 3 years and 5 years subscription)	SRX4600
Logical System License (1, 5, and 25 Incremental)	SRX4600
Remote Access (5 Concurrent users, NCP)	SRX4600
Remote Access (10 Concurrent users, NCP)	SRX4600
Remote Access (25 Concurrent users, NCP)	SRX4600
Remote Access (50 Concurrent users, NCP)	SRX4600
Remote Access (100 Concurrent users, NCP)	SRX4600
Remote Access (150 Concurrent users, NCP)	SRX4600
Remote Access (250 Concurrent users, NCP)	SRX4600
Remote Access (500 Concurrent users, NCP)	SRX4600
Remote Access (1000 Concurrent users, NCP)	SRX4600
Remote Access (2000 Concurrent users, NCP)	SRX4600
Remote Access (5000 Concurrent users, NCP)	SRX4600

Licensed Software Feature	Supported Devices
SecIntel	SRX4600
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX4600

Features Requiring a License on SRX5400 Devices

Table 121 lists the licenses you can purchase for each SRX Series software feature.

Table 121 SRX5400 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX5400
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX5400
Logical System License (1, 5, and 25 Incremental)	SRX5400
Remote Access (5 Concurrent users, NCP)	SRX5400
Remote Access (10 Concurrent users, NCP)	SRX5400
Remote Access (25 Concurrent users, NCP)	SRX5400
Remote Access (50 Concurrent users, NCP)	SRX5400
Remote Access (100 Concurrent users, NCP)	SRX5400
Remote Access (150 Concurrent users, NCP)	SRX5400
Remote Access (250 Concurrent users, NCP)	SRX5400
Remote Access (500 Concurrent users, NCP)	SRX5400
Remote Access (1000 Concurrent users, NCP)	SRX5400
Remote Access (2000 Concurrent users, NCP)	SRX5400
Remote Access (5000 Concurrent users, NCP)	SRX5400
Remote Access (10K Concurrent users, NCP)	SRX5400
SecIntel	SRX5400
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX5400

Features Requiring a License on SRX5600 Devices

Table 122 lists the licenses you can purchase for each SRX Series software feature.

Table 122 SRX5600 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX5600
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX5600
Logical System License (1, 5, and 25 Incremental)	SRX5600
Remote Access (5 Concurrent users, NCP)	SRX5600
Remote Access (10 Concurrent users, NCP)	SRX5600
Remote Access (25 Concurrent users, NCP)	SRX5600
Remote Access (50 Concurrent users, NCP)	SRX5600
Remote Access (100 Concurrent users, NCP)	SRX5600
Remote Access (150 Concurrent users, NCP)	SRX5600
Remote Access (250 Concurrent users, NCP)	SRX5600
Remote Access (500 Concurrent users, NCP)	SRX5600
Remote Access (1000 Concurrent users, NCP)	SRX5600
Remote Access (2000 Concurrent users, NCP)	SRX5600
Remote Access (5000 Concurrent users, NCP)	SRX5600
Remote Access (10K Concurrent users, NCP)	SRX5600
SecIntel	SRX5600
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX5600

Features Requiring a License on SRX5800 Devices

Table 123 lists the licenses you can purchase for each SRX Series software feature.

Table 123 SRX5800 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX5800
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX5800
Logical System License (1, 5, and 25 Incremental)	SRX5800
Remote Access (5 Concurrent users, NCP)	SRX5800
Remote Access (10 Concurrent users, NCP)	SRX5800
Remote Access (25 Concurrent users, NCP)	SRX5800
Remote Access (50 Concurrent users, NCP)	SRX5800
Remote Access (100 Concurrent users, NCP)	SRX5800
Remote Access (150 Concurrent users, NCP)	SRX5800
Remote Access (250 Concurrent users, NCP)	SRX5800
Remote Access (500 Concurrent users, NCP)	SRX5800
Remote Access (1000 Concurrent users, NCP)	SRX5800
Remote Access (2000 Concurrent users, NCP)	SRX5800
Remote Access (5000 Concurrent users, NCP)	SRX5800
Remote Access (10K Concurrent users, NCP)	SRX5800
SecIntel	SRX5800
ATP Cloud (1 year, 3 years and 5 years subscription)	SRX5800

Features Requiring a License on SRX100 and SRX110 Devices

Table 124 lists the licenses you can purchase for each SRX Series software feature.

Table 124 SRX100 and SRX110 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Application Security and Intrusion Prevention Signatures (1 year and 3 years subscription)	SRX100 SRX110
Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX100 SRX110
Kaspersky antivirus (1 year and 3 years subscription)	SRX100 SRX110
Kaspersky antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX100 SRX110
Sophos antispam (1 year and 3 years subscription)	SRX100 SRX110
Sophos antivirus (1 year and 3 years subscription)	SRX100 SRX110
Sophos antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX100 SRX110
Websense Enhanced Web Filtering (1 year and 3 years subscription)	SRX100 SRX110

Features Requiring a License on SRX210 Devices

Table 125 lists the licenses you can purchase for each SRX Series software feature.

Table 125 SRX210 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Application Security and Intrusion Prevention Signatures (1 year and 3 years subscription)	SRX210
Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX210

Licensed Software Feature	Supported Devices
Kaspersky antivirus (1 year and 3 years subscription)	SRX210
Kaspersky antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX210
Sophos antispam (1 year and 3 years subscription)	SRX210
Sophos antivirus (1 year and 3 years subscription)	SRX210
Sophos antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX210
Websense Enhanced Web Filtering (1 year and 3 years subscription)	SRX210

Features Requiring a License on SRX220 Devices

Table 126 lists the licenses you can purchase for each SRX Series software feature.

Table 126 SRX220 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Application Security and Intrusion Prevention Signatures (1 year and 3 years subscription)	SRX220
Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX220
Kaspersky antivirus (1 year and 3 years subscription)	SRX220
Kaspersky antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX220
Sophos antispam (1 year and 3 years subscription)	SRX220
Sophos antivirus (1 year and 3 years subscription)	SRX220
Sophos antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX220
Websense Enhanced Web Filtering (1 year and 3 years subscription)	SRX220

Features Requiring a License on SRX240 Devices

Table 127 lists the licenses you can purchase for each SRX Series software feature.

Table 127 SRX240 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Application Security and Intrusion Prevention Signatures (1 year and 3 years subscription)	SRX240
Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX240
Kaspersky antivirus (1 year and 3 years subscription)	SRX240
Kaspersky antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX240
Sophos antispam (1 year and 3 years subscription)	SRX240

Licensed Software Feature	Supported Devices
Sophos antivirus (1 year and 3 years subscription)	SRX240
Sophos antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX240
Websense Enhanced Web Filtering (1 year and 3 years subscription)	SRX240

Features Requiring a License on SRX550 Devices

Table 128 lists the licenses you can purchase for each SRX Series software feature.

Table 128 SRX550 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX550
Kaspersky antivirus (1 year, 3 years and 5 years subscription)	SRX550
Kaspersky antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX550
Remote Access (5 Concurrent users, NCP)	SRX550
Remote Access (10 Concurrent users, NCP)	SRX550
Remote Access (25 Concurrent users, NCP)	SRX550
Remote Access (50 Concurrent users, NCP)	SRX550
Remote Access (100 Concurrent users, NCP)	SRX550
Remote Access (150 Concurrent users, NCP)	SRX550
Remote Access (250 Concurrent users, NCP)	SRX550
Remote Access (500 Concurrent users, NCP)	SRX550
Remote Access (1000 Concurrent users, NCP)	SRX550
SecIntel	SRX550

Licensed Software Feature	Supported Devices
Sky Advanced Threat Prevention (1 year, 3 years and 5 years subscription)	SRX550
Sophos antispam (1 year, 3 years and 5 years subscription)	SRX550
Sophos antivirus (1 year and 3 years subscription)	SRX550
Sophos antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year, 3 years and 5 years subscription)	SRX550

Features Requiring a License on SRX650 Devices

Table 129 lists the licenses you can purchase for each SRX Series software feature.

Table 129 SRX650 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Application Security and Intrusion Prevention Signature (1 year and 3 years subscription)	SRX650
Enhanced Web Filtering (1 year, 3 years and 5 years subscription)	SRX650
Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX650
Kaspersky antivirus (1 year and 3 years subscription)	SRX650
Kaspersky antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX650
Sophos antispam (1 year and 3 years subscription)	SRX650
Sophos antivirus (1 year and 3 years subscription)	SRX650
Sophos antivirus, Enhanced Web Filtering, Sophos antispam, Application Security and Intrusion Detection and Prevention (1 year and 3 years subscription)	SRX650

Features Requiring a License on SRX3400 Devices

Table 130 lists the licenses you can purchase for each SRX Series software feature.

Table 130 SRX3400 Junos OS Feature License Model Number

Licensed Software Feature	Supported Devices
Application Security, Intrusion Detection and Prevention, Enhanced Web Filtering, Antivirus and Sky Advanced Threat Prevention (1 year and 3 year subscription)	SRX3400

Understanding Chassis Cluster Licensing Requirements

There is no separate license required for chassis cluster. However, some Junos OS software features require a license to activate the feature. To configure and use the licensed feature in a chassis cluster setup, you must purchase one license per feature per device and the license needs to be installed on both nodes of the chassis cluster. Both devices (which are going to form a chassis cluster) must have the valid, identical features licenses installed on them. If both devices do not have an identical set of licenses, then after a failover, a particular feature (that is, a feature that is not licensed on both devices) might not work or the configuration might not synchronize in chassis cluster formation. Licensing is usually ordered when the device is purchased, and this information is bound to the chassis serial number. For example, Intrusion Detection and Prevention (IDP) is a licensed feature and the license for this specific feature is tied to the serial number of the device.

For information about how to purchase software licenses, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

Understanding Licenses for Logical Systems and Tenant Systems on SRX Series Devices

This topic provides licensing information for SRX Series devices running logical systems and tenant systems.

Starting in Junos OS Release 18.3R1, an SRX Series device running logical systems or tenant systems includes three licenses by default. Starting in Junos OS Releases 20.3R3, 20.4R2, 21.1R2, and 21.2R1, you can use the features for logical systems and tenant systems without a license. One license for a primary logical system and the other two licenses for user-defined logical system or tenant system. The system does not allow you to configure additional logical systems or tenant systems if the number of logical systems and tenant systems exceeds the number of available licenses. In the earlier releases, the system allowed you to configure an additional logical system even if the number of logical systems exceeds the number of available licenses, but with a warning message of non-licensed logical-systems do not pass traffic. You can purchase licenses for additional logical systems and tenant systems that you intend to create. If you intend to configure an interconnect logical system or interconnect tenant system to use as a switch, it also requires separate licenses.

We enforce that you do not configure more logical systems or tenant systems than the number of licenses you have purchased. If the number of logical systems or tenant systems that you attempt to configure exceeds the number of licenses that you have purchased, then the system displays an error message similar to the following:

```
user@host# commit
error: 2 more multitenancy license(s) are needed!
error: configuration check-out failed
```

You can use the **show system license status all-logical-systems-tenants** or **show system license usage** commands to view the active logical systems and tenant systems on the device.

```
user@host> show system license status all-logical-systems-tenants
logical system name  license status
root-logical-system  enabled
LSYS2                enabled
LSYS0                enabled
LSYS11               enabled
LSYS12               enabled
LSYS23               enabled
TSYS1                enabled
TSYS2                enabled
TSYS3                enabled


user@host> show system license usage
                 Licenses  Licenses   Licenses   Expiry
   Feature name   used      installed   needed
   logical-system   9          11         0        2019-05-18
                                                   08:00:00 CST
```

When you use SRX Series devices running logical systems or tenant systems in a *chassis cluster*, you must purchase and install the same number of licenses for each node in the chassis cluster. Logical systems or tenant systems licenses pertain to a single chassis, or node, within a chassis cluster and not to the cluster collectively.

Understanding Content Security Licensing

The majority of Content Security features function as a subscription service requiring a license. You can redeem this license once you have purchased your subscription license SKUs. You redeem your license by entering your authorization code and chassis serial number into the Customer Service license portal interface. Once your entitlement is generated, you can use the CLI from your device to send a license update request to the license portal. The license portal then sends your subscription license directly to the device.

> **Note**: The products supported by the Juniper Agile Licensing (JAL) portal includes: QFX series, SRX Series, EX Series, NFX, vBNG, vMX, vSRX, and ACX. For other Juniper products (SPACE, JSA, SBR Carrier, Screen OS and so on) access the License Management System (LMS).

> **Note**: Content Security requires 1 GB of memory.

Table 131 Content Security Feature Subscription Service License Requirements

Content Security Feature	Require License
Antispam	Yes
Antivirus: sophos	Yes
Content Filtering	No
Web Filtering: integrated	Yes
Web Filtering: redirect	No
Web Filtering: local	No
Web Filtering: enhanced	Yes

Note: License enforcement is supported on all SRX Series devices. Licensed features including anti-virus or Enhanced Web Filtering will not function until a license has been installed. The license must be installed after installing or upgrading to a new Junos OS Release version. Unlicensed features such as Content Security blocklists and allowlists will continue to function without a license.

Installing and Verifying Licenses for an Application Signature Package

The Junos OS application signature package update is a separately licensed subscription service. You must install the application signature package update license key on your device to download and install the signature database updates provided by Juniper Networks. If your license key expires, you can continue to use the locally stored application signature package content.

Licensing is usually ordered when the device is purchased, and this information is bound to the chassis serial number. These instructions assume that you already have the license. If you did not order the license during the purchase of the device, contact your account team or Juniper customer care for assistance. For more information, refer to the Knowledge Base article KB9731 at https://kb.juniper.net/InfoCenter/index?page=home.

Starting from Junos OS 15.1X49-D30 and Junos OS Release 17.3R1, on SRX1500 devices, AppSecure is part of Junos Software Enhanced (JSE) software license package. There is no separate license key for AppSecure is available. You must use JSE software license on your device to download and install the

AppID signature database updates, or to use other AppSecure features such as AppFW, AppQoS, and AppTrack.

Starting from Junos OS 15.1X49-D30 and Junos OS Release 17.3R1, on SRX300, SRX320, SRX340, and SRX345 devices, AppSecure is part of Junos Software Enhanced (JSE) software license package. There is no separate license key for AppSecure is available. You must use JSE software license on your device to download and install the AppID signature database updates, or to use other AppSecure features such as AppFW, AppQoS, and AppTrack.

Starting from 15.1X49-D65 and Junos OS Release 17.3R1, on SRX4100, and SRX4200 devices, AppSecure is part of Junos Software Enhanced (JSE) license package. There is no separate license key for AppSecure is available. You must use JSE software license on your device to download and install the AppID signature database updates, or to use other AppSecure features such as AppFW, AppQoS, and AppTrack.

Junos Software Base (JSB) package does not include application signatures. Please refer to the product Data Sheets at SRX Series Services Gateways for details, or contact your Juniper Account Team or Juniper Partner.

You can install the license on the SRX Series device using either the automatic method or manual method as follows:

1. Install your license automatically on the device.

   To install or update your license automatically, your device must be connected to the Internet .

   ```
   user@host> request system license update
   ```

   ```
   Trying to update license keys from https://ae1.juniper.net, use 'show system license' to check
   status.
   ```

2. Install the licenses manually on the device.

   ```
   user@host> request system license add terminal
   ```

   ```
   [Type ^D at a new line to end input,
    enter blank line between each license key]
   ```

   Paste the license key and press Enter to continue.

1. Verify the license is installed on your device.

Use the **show system license** `command` command to view license usage, as shown in the following example:

```
  License usage:
                                Licenses   Licenses   Licenses   Expiry
    Feature name                    used   installed   needed
    logical-system                     4          1         3   permanent


   License identifier: JUNOSXXXXXX
   License version: 2
   Valid for device: AA4XXXX005
   Features:
     appid-sig        - APPID Signature
        date-based, 2014-02-17 08:00:00 GMT-8 - 2015-02-11 08:00:00 GMT-8
```

The output sample is truncated to display only license usage details.

Release History Table

Release	Description
20.3R3	Starting in Junos OS Releases 20.3R3, 20.4R2, 21.1R2, and 21.2R1, you can use the features for logical systems and tenant systems without a license.
18.3R1	Starting in Junos OS Release 18.3R1, an SRX Series device running logical systems or tenant systems includes three licenses by default.
15.1X49-D65	Starting from 15.1X49-D65 and Junos OS Release 17.3R1, on SRX4100, and SRX4200 devices, AppSecure is part of Junos Software Enhanced (JSE) license package.
15.1X49-D40	Starting from Junos OS 15.1X49-D30 and Junos OS Release 17.3R1, on SRX300, SRX320, SRX340, and SRX345 devices, AppSecure is part of Junos Software Enhanced (JSE) software license package.
15.1X49-D30	Starting from Junos OS 15.1X49-D30 and Junos OS Release 17.3R1, on SRX1500 devices, AppSecure is part of Junos Software Enhanced (JSE) software license package.

Licenses for vSRX

vSRX Feature Licenses Overview

Starting January 2020, Juniper Networks is transitioning to the Flex Software Subscription Licensing Model for vSRX. If you are not currently using the legacy licenses model, refer the vSRX Flex Software Subscription Licensing Model.

If you have any questions, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/ and they will assist you in choosing the best licensing model for your application.

Some Junos OS software features require a *license* to activate the feature.

To enable a licensed feature, you need to purchase, install, manage, and verify a license key that corresponds to each licensed feature. To conform to software feature licensing requirements, you must purchase one license per feature per instance. The presence of the appropriate software unlocking key on your virtual instance allows you to configure and use the licensed feature.

If applicable for your vSRX deployment, vSRX pay-as-you-go images do not require any separate licenses.

vSRX License Procurement and Renewal

Licenses are usually ordered when the software application is purchased, and this information is bound to a customer ID. If you did not order the licenses when you purchased your software application, contact your account team or Juniper Networks Customer Care for assistance.

Licenses can be procured from the Juniper Networks License Management System (LMS).

For license renewal, use the `show system license` command to find the Juniper vSRX software serial number that you use to renew a license.

```
vsrx> show system license
License usage:
                                 Licenses     Licenses    Licenses     Expiry
   Feature name                      used    installed      needed
   Virtual Appliance                    1            1           0     58 days

Licenses installed:
   License identifier: E420588955
   License version: 4
```

```
Software Serial Number: 20150625
Customer ID: vSRX-JuniperEval
Features:
  Virtual Appliance - Virtual Appliance
    count-down, Original validity: 60 days


License identifier: JUNOS657051
License version: 4
Software Serial Number: 9XXXXAXXXXXXX9
Customer ID: MyCompany
Features:
  Virtual Appliance - Virtual Appliance
    permanent
```

Do not use the `show chassis hardware` command to get the serial number on vSRX, because that command is only appropriate for the physical SRX Series devices. Also, the license for advanced security features available on the physical SRX Series devices cannot be used with vSRX deployments.

If you are performing a software downgrade with licenses installed, you will see an error message in the CLI when you try to configure the licensed features or run the `show system license status` command.

We recommend deleting existing licenses before performing a software downgrade.

vSRX Evaluation License

To speed deployment of licensed features, the vSRX software image provides you with a 60-day product evaluation license and a 30-day advanced security features license, both of which allow you to use vSRX and licensed features for a specified period without having to install a license key.

Table 132 lists vSRX evaluation license types.

Table 132 vSRX Evaluation License Type

License Package	Type	Period	License Model Number
Trial license (temporary for evaluation only)	Product evaluation–Basic	60 days	-
	Product evaluation–Advanced features	30 days	-

Product Evaluation License

The vSRX software image includes a 60-day trial license. When you download and install the vSRX image, you are entitled to use this trial license for 60 days. It is intended as an evaluation license for using vSRX. This product-unlocking license is required to use the basic functions of the vSRX, such as networking, routing, and basic security features (such as stateful firewall).

The use of the 60-day trial license does not include vSRX support unless you already have a pre-existing vSRX support contract. If you require support during this 60-day evaluation period, please work with your Juniper Account team or go to the J-Net Community forum (https://forums.juniper.net/) and view the Support topics under the vSRX category.

Within 30 days of the license expiration date, a license expiration warning appears each time you log in to the vSRX instance. After the product evaluation license expires, you will not be able to use the vSRX; it will be disabled and flow configuration options will not work (the vSRX will stop forwarding traffic). At this point, only management interfaces and CLI configurations are preserved.

Advanced Security Features Evaluation License

The advanced security features license is a 30-day trial license for vSRX that is required for advanced security features such as UTM, IDP, and AppSecure. You can download the trial license for advanced security features from the vSRX Free Trial License Page.

The 30-day trial license period begins on the day you enable the enhanced security features after you install the 60-day product evaluation license for vSRX. To continue using vSRX features after the 30-day license period expires, you must purchase and install the license; otherwise, the features are disabled. If the license for advanced security features expires while the evaluation license (product unlocking license) is still valid, only the advanced security features that require a license are disabled.

The UTM advanced features have a slightly different trial license strategy. UTM does not requires 30-day trial license but only a 30-day grace period. Once the 30-day advanced security features trial license expires, Juniper Networks supports a 30-day grace period for you to continue using UTM features. The 30-day grace period goes into effect after the 30-trial license expires.

There is also a 30-day trial license available for Juniper Sky Advanced Threat Prevention (ATP). This is a second license that you can apply for a 30-day period in addition to the advanced security features license for vSRX to enable the Juniper Sky ATP features. You can download the Juniper Sky ATP trial license from the vSRX Free Trial License Page.

License Types

Juniper Networks provides a variety of licenses for both basic firewall features and advanced security features for different throughputs and durations.

If you want to use vSRX to provide basic firewall features, you can use standard (basic) licenses. However, to use some of the more advanced security features, such as AppSecure, IDP, and UTM, you might need to purchase advanced features licenses.

The high-level categories for licenses are:

1. **Throughput**—All licenses have an associated throughput. Throughput rates include 1 Gbps, 2 Gbps, and 4 Gbps on most platforms.

2. **Features**—Licenses are available for different combinations of feature sets, from standard (STD) through Content Security Bundled (CSB).

3. **Individual or bundled**—Licenses can be individual (á la carte) licenses for a set of features, or can be bundled together to provide a broad range of features in one easy license to maintain.

   Individual licenses are not supported.

4. **Duration**—All licenses have an associated time duration. You can purchase basic licenses as perpetual (never expire) or subscription based (1-year or 3-year duration). All vSRX licenses are subscription based.

5. **New or renewal**—All subscription licenses are either new (first-time purchase) or renewals (extending the license duration when the initial new subscription license is about to expire).

Figure 2 shows a sample license SKU and identifies how each field maps to these categories.

Figure 2 Sample vSRX License SKU

These categories of licenses can also be combined, or stacked, to provide more flexibility for your vSRX use cases.

Throughput

Bandwidth or throughput license types allow you to use a single instance of the software for up to the maximum throughput specified in the license entitlement. Throughput can be combined on a single instance of the software so that the maximum throughput for that instance is the aggregate of all the throughput licenses assigned to that instance. A throughput license cannot be split across multiple instances. Throughput is identified in the license entitlement in megabits per second (Mbps), or gigabits per second (Gbps).

For example, if you want 3 Gbps of throughput for a vSRX instance using the STD features, you would purchase a 1G STD license and a 2G STD license and install both on the vSRX. If you wanted 2 Gbps of throughput on two vSRX instances acting as a chassis cluster, you could not use the same 2 Gbps license on both vSRX instances. You would need to purchase one set of licenses for each vSRX instance in the cluster.

License Duration

All licenses can be perpetual or subscription based.

1. Perpetual license–A perpetual license allows you to use the licensed software indefinitely. Perpetual licenses do not require renewals. Perpetual licenses do not include maintenance and upgrade support. You must purchase that separately, vSRX software releases such as vSRX for Nutanix do not support perpetual licenses.

2. Subscription license–A subscription license is an annual license that allows you to use the licensed software feature for the matching duration. Subscriptions might involve periodic downloads of content (such as for IDP threat signature files). Subscription licenses start when you retrieve the license key or 30 days after purchase if you have not retrieved the license key. At the end of the license period, you need to renew the license to continue using it.

   All subscription licenses are renewable. To renew a subscription license, purchase a new subscription of the same license. For more information, see Subscription - Register and Install.

Individual (á la carte) Feature Licenses

Every vSRX instance requires at least one standard license to support the desired throughput rate. Beyond that, you can select from a range of individual feature licenses that provide additional security feature sets. The feature license must match the standard license rate.

Individual licenses are not supported.

For example, if you need AppSecure and Sophos antivirus features at 1 Gbps of throughput for a year, you could purchase the following individual licenses:

1. VSRX-STD-1G-1—Provides the standard feature set and 1 Gbps of throughput.

2. VSRX-CS-1G-1—Provides the advanced features.

Bundled Licenses

Bundled licenses simplify the license management by combining one or more individual licenses into a single bundled license. Instead of installing and managing a standard throughput license and one or more individual advanced feature licenses, you can purchase one of the bundle license options and manage one license instead.

For example, if you need AppSecure and Sophos antivirus features at 1 Gbps of throughput for a year, you could purchase the single bundled VSRX-CS-B-1G-1 license, which includes the STD throughput license. This means you only need to manage one license instead of two individual licenses.

Stacking Licenses

You can combine individual or bundled licenses to combine features or build up the overall supplied throughput for the vSRX instance.

For example, you can combine a 1-Gbps license and a 2-Gbps license to have 3 Gbps of throughput for the vSRX instance. You can also combine individual licenses, such as Sophos antivirus (SAV) and Websense Enhanced Web Filtering (EWF) to get both sets of security features.

Individual licenses require an STD license with the same throughput rate.

vSRX License Keys Components

A license key consists of two parts:

1. License ID—Alphanumeric string that uniquely identifies the license key. When a license is generated, it is given a license ID.

2. License data—Block of binary data that defines and stores all license key objects.

For example, in the following typical license key, the string E413XXXX57 is the license ID, and the trailing block of data is the license data:

```
E413XXXX57 aaaaaa bbbbbb cccccc dddddd eeeeee ffffff
       cccccc bbbbbb dddddd aaaaaa ffffff aaaaaa
       aaaaaa bbbbbb cccccc dddddd eeeeee ffffff
       cccccc bbbbbb dddddd aaaaaa ffffff
```

The license data conveys the customer ID and the software serial number (Juniper Networks support reference number) to the vSRX instance.

License Management Fields Summary

The Licenses window displays a summary of licensed features that are configured on the vSRX instance and a list of licenses that are installed on the vSRX instance.

To view the license details, select **Maintain>Licenses** in the J-Web user interface. The Licenses window appears as shown in the Figure 3.

Figure 3 J-Web Licenses Window Showing Installed Licenses

You can also view the details of a license in the CLI using the `show system license` command. The following sample shows details of an evaluation license in the CLI:

```
License usage:

                           Licenses     Licenses     Licenses    Expiry
   Feature name                used    installed      needed
   anti_spam_key_sbl              0            1           0     2016-04-15 08:00:00 CST
   idp-sig                        0            1           0     2016-04-15 08:00:00 CST
   appid-sig                      0            1           0     2016-04-15 08:00:00 CST
   av_key_sophos_engine           0            3           0     2016-07-29 08:00:00 CST
   wf_key_websense_ewf            0            1           0     2016-04-15 08:00:00 CST
   Virtual Appliance              1            1           0     2016-04-25 08:00:00 CST

Licenses installed:
  License identifier: E420588955
  License version: 4
  Software Serial Number: 20150625
  Customer ID: vSRX-JuniperEval
  Features:
    Virtual Appliance - Virtual Appliance
      count-down, Original validity: 60 days
```

The information on the license management page is summarized in the Table 133.

Table 133 Summary of License Management Fields

Field Name	Definition
Feature Summary	
Feature	Name of the licensed feature: 1. `Features`—Software feature licenses. 2. `All features`—All-inclusive licenses.
Licenses Used	Number of licenses currently being used on the vSRX instance. Usage is determined by the configuration. If a feature license exists and that feature is configured, the license is considered used.
Licenses Installed	Number of licenses installed on the vSRX instance for the particular feature.
Licenses Needed	Number of licenses required for legal use of the feature. Usage is determined by the configuration on the vSRX instance: If a feature is configured and the license for that feature is not installed, a license is needed.
Licenses expires on	Date the license expires.
Installed Licenses	
ID	Unique alphanumeric ID of the license.
State	`Valid`—The installed license key is valid. `Invalid`—The installed license key is not valid.
Version	Numeric version number of the license key.
Group	If the license defines a group license, this field displays the group definition. Because group licenses are currently unsupported, this field is always blank.
Enabled Features	Name of the feature that is enabled with the particular license.
Expiration	Date the license expires.

Field Name	Definition
Software serial number	The serial number is a unique 14-digit number that Juniper Networks uses to identify your particular software installation. You can find the software serial number in the Software Serial Number Certificate attached to the e-mail that was sent when you ordered your Juniper Networks software or license. You can also use the `show system license` command to find the software serial number.
Customer ID	ID that identifies the registered user.

Managing Licenses for vSRX

Before you begin, ensure that you have retrieved the license key from the Juniper Agile Licensing (JAL) Portal.

For more information on Juniper Agile Licensing (JAL) Portal, see Juniper Agile Licensing (JAL) Portal - Frequently Asked Questions

This section includes the following topics:

vSRX Evaluation License Installation Process

Juniper Networks provides a 60-day evaluation license for vSRX standard features. When you download and install the vSRX image, you are entitled to use this evaluation license for 60 days as a trial. In addition to the 60-day vSRX evaluation license, there is a 30-day advanced security features trial license for vSRX that is required for advanced security features such as UTM, IDP, and AppSecure.

You can download the 30-day advanced security feature trial license from the vSRX Free Trial License Page.

There is also a 30-day trial license available for Juniper Sky Advanced Threat Prevention (ATP). This is a second license that you can apply for a 30-day period in addition to the advanced security features license for vSRX to enable the Sky ATP features. You can download the Sky ATP trial license from the vSRX Free Trial License Page

Installation of the advanced security feature trial license is similar to the regular license installation performed from the CLI (see "Adding a New License Key from the CLI" on page 201).

Within 30 days of the license expiration date, a license expiration warning appears each time you log in to the vSRX instance. After the product evaluation license expires, you will not be able to use the vSRX; it will be disabled and flow configuration options will not work (the vSRX will stop forwarding traffic). At this point, only management interfaces and CLI configurations are preserved.

The 30-day evaluation license period begins on the day you enable enhanced security features after installing evaluation licenses.

To continue using vSRX features after an optional 30-day evaluation period, you must purchase and install the license. Otherwise, the features are disabled.

For details about the 60- and 30-day license evaluation periods for the vSRX see *vSRX Feature Licenses Overview* .

Adding a New License Key with J-Web

To install a license using the *J-Web* interface:

1. Select **Maintain>Licenses** on the J-Web user interface. The Licenses window is displayed as shown in Figure 4.

Figure 4 J-Web Licenses Window
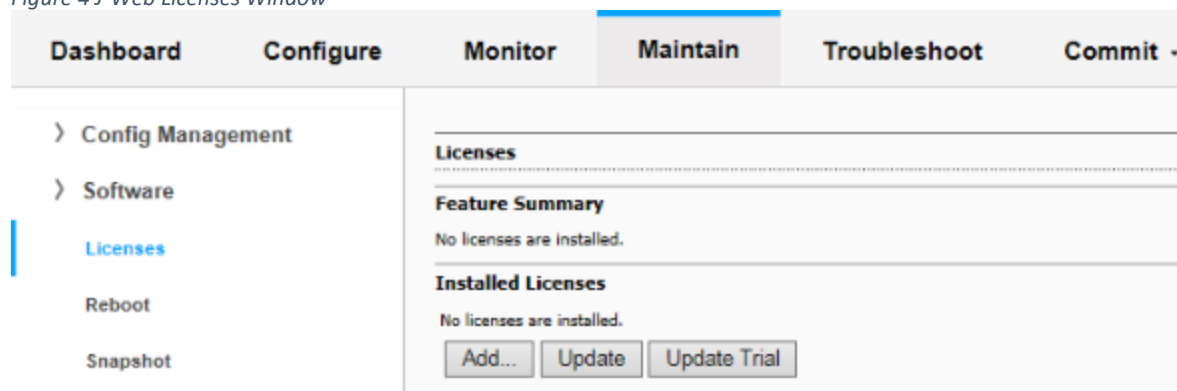
2. Under Installed Licenses, click **Add**. The Add License window is displayed as shown in Figure 5.

Figure 5 Add License Window
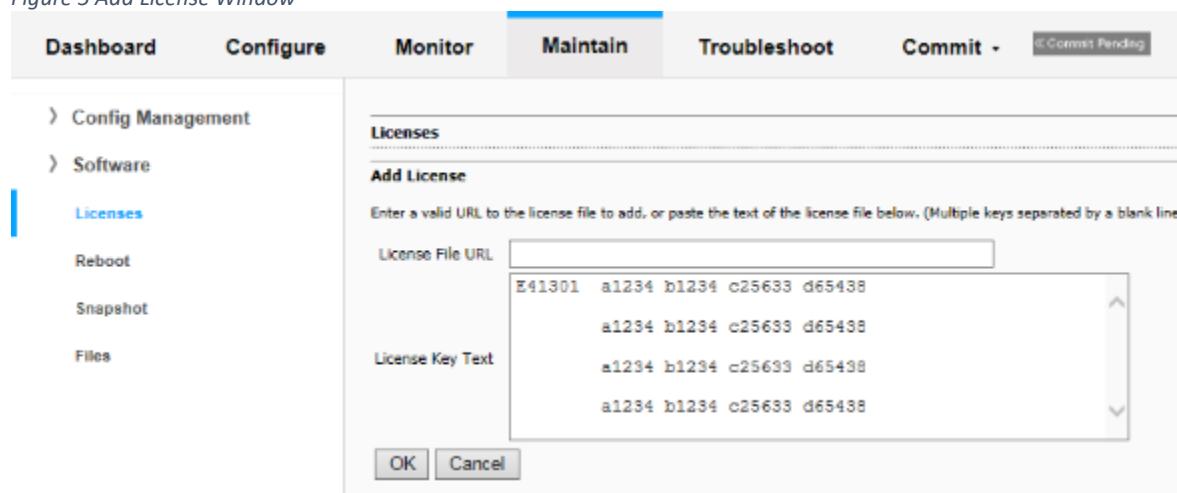
3. Do one of the following, using a blank line to separate multiple license keys:

    1. Enter the full URL to the destination file containing the license key in the License File URL box.

    2. Paste the license key text, in plaintext format, in the License Key Text box.

3. Click **OK** to add the license key. The License Details window is displayed as shown in Figure 6.

Figure 6 License Details Window

The license key is installed and activated on the vSRX instance.

Adding a New License Key from the CLI

You can add a license key from a local file, from a remote URL, or from the terminal.

To install a license from the CLI:

1. Use the `request system license add` operational mode command to either add the license from a local file or remote URL that contains the license key, or to manually paste the license key in the terminal.

```
user@vsrx> request system license add terminal

[Type ^D at a new line to end input,
 enter blank line between each license key]

E413XXXX57  aaaaaa bbbbbb cccccc dddddd eeeeee ffffff
      cccccc bbbbbb dddddd aaaaaa ffffff aaaaaa
      aaaaaa bbbbbb cccccc dddddd eeeeee ffffff
      cccccc bbbbbb dddddd aaaaaa ffffff

E413XXXX57: successfully added
add license complete (no errors)
```

You can save the license key to a file and upload the file to the vSRX file system through FTP or Secure Copy (SCP), and then use the `request system license add` *file-name* command to install the license.

2. Optionally, use the `show system license` command to view details of the licenses.

```
root@host> show system license

License usage:      Licenses   Licenses   Licenses    Expiry
Feature name           used    installed    needed
```

```
wf key websense ewf        1        0        1     invalid


Licenses installed: none
```

The license key is installed and activated on the vSRX instance.

View vSRX License Information

You can view the vSRX license information using either of the following two methods:

1. Serial Number Entitlement

2. Juniper Agile Licensing Portal

To view the vSRX licenses information using Serial Number Entitlement:

1. Navigate to the Serial Number Entitlement.
2. Enter the *Serial Number* or *Software Support Reference Number* or *Contract ID* in the data input field.
3. Click **View Entitlement Information** to see the vSRX license information for the given *Serial Number* or *Software Support Reference Number* or *Contract ID*.

To view the vSRX licenses information using Juniper Agile Licensing Portal

1. Log in to the Juniper Agile Licensing Portal.

2. Navigate to **My Entitlements** section to see the vSRX license information.

Updating vSRX Licenses

You can update the vSRX licenses using either of the following two methods:

1. Automatic license update using the CLI

2. Manual license update using the CLI

As a prerequisite, you must install at least one valid license key on your vSRX instance for required features. Automatic license updates as well as manual license updates are performed based on a valid software serial number and customer ID embedded in the license key.

To enable automatic license updates from the CLI:

1. Contact your account team or Juniper Networks Customer Care to extend the validity period of existing license keys and obtain the URL for a valid update server.
2. Once you have successfully extended your license key and received the update server URL, configure the auto-update parameter:

```
user@host# set system license autoupdate url https://ae1.juniper.net/junos/key_retrieval
```

3. Configure renew options (if required). The following sample allows vSRX to contact the license server 30 days before the current license expires and sends an automatic update request every 6 hours.

```
user@host> set system license renew before-expiration 30
user@host> set system license renew interval 6
```

To manually update the licenses from the CLI:

1. Use the following command to update the license keys manually:

```
user@host> request system license update <url.of.license.server>
```

This command sends a license update request to the license server immediately.

The `request system license update` command will always use the default Juniper license server: https://ae1.juniper.net

2. Check the status of the license by entering the `show system license` command.

Deleting a License with J-Web

To delete a license using the J-Web interface:

1. Select **Maintain>Licenses**.
2. Select the check box of the license or licenses you want to delete as shown in .Figure 7.

Figure 7 Deleting a License

3. Click **Delete**.

4. Click **OK** to confirm your deletion as shown in Figure 8.

Figure 8 Delete Licenses Window

The license you deleted is removed.

Deleting a License with the CLI

To delete a license using the CLI:

1. From operational mode, for each license, enter the following command and specify the license ID. You can delete only one license at a time.

```
user@host> request system license delete <license-key-identifier>
```

Or you can use the following command to delete all installed licenses.

```
user@host> request system license delete all
```

2. Type yes when you are prompted to confirm the deletion.

```
Delete license JUNOS606279 ? [yes,no] (no)
```

The license you deleted is removed.

License Warning Messages

You must purchase a new license or renew your existing subscription-based license to have a seamless transition from the old license to the new one.

The following conditions occur when a license expires on vSRX:

1. Evaluation license for the core expires—Packet forwarding on vSRX is disabled. However, you can manage vSRX through the fxp0 management interface, and the CLI configuration is preserved.

2. Subscription-based licenses for advanced security features expire but subscription-based licenses for core services are active—A 30-day grace period begins, allowing the user to continue using advanced security features. After the grace period, advanced security features are disabled. Basic features are always available in the vSRX. After subscription-based licenses for core services expire, a warning message is displayed to notify the user, but basic features will remain preserved for the user.

3. Subscription-based license for core features expires but subscription-based license for advanced security features is active—A warning message is displayed to notify the user. However, you can continue to use the basic features on the vSRX. Advanced security features are disabled when the subscription-based license for advanced security features expires, but basic features will remain preserved for the user.

All advanced and premium licenses are offered as subscriptions. Subscription licenses are available in 1 year, 3 years, or 5 years terms. After the order fulfilment, the subscription period begins after the completion of 30 days grace period.

Table 134 describes the subscription terms for purchase and number of months to use the license.

Table 134 Subscription Terms Details

Subscription Terms	Number of Months for the License
1 year	13 months
3 years	37 months
5 years	61 months

All subscription licenses are renewable. To renew a subscription license, purchase a new subscription of the same license. For more information, see Subscription - Register and Install .

To use features that require a license, you must install and configure a license. After the license expires, warning messages are displayed in the system log and on the J-Web dashboard.

When a license expires, the System Alarms section of the J-Web dashboard displays a message stating that the license has expired as shown in Figure 9.

Figure 9 J-Web Dashboard for License Expiry Warning

When a license expires, the following message appears when you log in:

```
Virtual Appliance License is invalid
```

vSRX License Model Numbers

The licenses used by all Juniper Networks instances are based on SKUs, which represent lists of features. Each license includes a list of features that the license enables along with information about those features.

For information about purchasing software licenses, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

vSRX licenses are based on application packages and processing capacity.

vSRX provides bandwidth in the following capacities (throughput per instance): 1 Gbps, 2 Gbps, and 4 Gbps. Each of these bandwidth tiers is offered with three different packages.

Table 135 describes the features available with the various license packages.

Table 135 vSRX Licensing Package Types

License Type	Description	License Model Number
STD	Includes the following features: 1. Core security—firewall, ALG, screens, user firewall 2. IPsec VPN (site-to-site VPN) 3. NAT 4. CoS 5. Routing services—BGP, OSPF, DHCP, J-Flow, IPv4 6. Foundation—Static routing, management (J-Web, CLI, and NETCONF), on-box logging, diagnostics	These Standard (STD) bandwidth SKUs are available for vSRX: 1. VSRX-1G-STD-CLD-1: 1-Gbps throughput (1-year subscription) 2. VSRX-1G-STD-CLD-3: 1-Gbps throughput (3-year subscription) 3. VSRX-2G-STD-CLD-1: 2-Gbps throughput (1-year subscription) 4. VSRX-2G-STD-CLD-3: 2-Gbps throughput (3-year subscription) 5. VSRX-4G-STD-CLD-1: 4-Gbps throughput (1-year subscription) 6. VSRX-4G-STD-CLD-3: 4-Gbps throughput (3-year subscription)
ASCB	Includes all STD features bundled with IPS and Appsecure signatures, along with the following features: 1. AppID 2. AppFW 3. AppQoS 4. AppTrack	These AppSecurity Bundled (ASB) bandwidth SKUs are available for vSRX: 1. VSRX-1G-ASB-CLD-1: 1-Gbps throughput (1-year subscription) 2. VSRX-1G-ASB-CLD-3: 1-Gbps throughput (3-year subscription) 3. VSRX-2G-ASB-CLD-1: 2-Gbps throughput (1-year subscription) 4. VSRX-2G-ASB-CLD-3: 2-Gbps throughput (3-year subscription) 5. VSRX-4G-ASB-CLD-1: 4-Gbps throughput (1-year subscription) 6. VSRX-4G-ASB-CLD-3: 4-Gbps throughput (3-year subscription)

License Type	Description	License Model Number
CSB	Includes all STD features, along with the features bundled with ASCB, including the addition of the following UTM features: 1. Antivirus 2. Content filtering 3. Web filtering	These Content Security Bundled (CSB) bandwidth SKUs are available for vSRX: 1. VSRX-1G-CSB-CLD-1: 1-Gbps throughput (1-year subscription) 2. VSRX-1G-CSB-CLD-3: 1-Gbps throughput (3-year subscription) 3. VSRX-2G-CSB-CLD-1: 2-Gbps throughput (1-year subscription) 4. VSRX-2G-CSB-CLD-3: 2-Gbps throughput (3-year subscription) 5. VSRX-4G-CSB-CLD-1: 4-Gbps throughput (1-year subscription) 6. VSRX-4G-CSB-CLD-3: 4-Gbps throughput (3-year subscription)
ATP-B	vSRX-1G-ATP-B bundle includes: 1. Juniper Sky ATP + 2. Content Security + 3. ASEC (IDP + AppFW) + 4. STD	A vSRX-1G-ATP-B-1 bundle includes: 1G Throughput, 1 year Subscription License for vSRX ATP package, including features in Content Security (CS) package, and Juniper SkyATP.

License stacking is allowed. So, for example, to license 3 Gbps of throughput for the standard (STD) feature set for 1 year, use a VSRX-1G-STD-CLD-1 license and a VSRX-2G-STD-CLD-1.

vSRX License Model Numbers for Contrail, KVM, Microsoft Hyper-V, and VMware

The licenses used by all Juniper Networks instances are based on SKUs, which represent lists of features. Each license includes a list of features that the license enables along with information about those features.

For information about purchasing software licenses, contact your Juniper Networks sales representative at https://www.juniper.net/in/en/contact-us/.

vSRX licenses are based on application packages and processing capacity.

Bandwidth (throughput) licenses allow you to use a single instance of the software for up to the maximum throughput specified in the license entitlement. Throughput licenses can be combined on a

single instance of the software so that the maximum throughput for that instance is the aggregate of all the throughput licenses assigned to that instance. A throughput license cannot be split across multiple instances. Throughput licenses are identified in the license entitlement in megabits per second (Mbps), or gigabits per second (Gbps).

vSRX provides bandwidth in the following capacities (throughput per instance): 100 Mbps, 1 Gbps, 2 Gbps, 4 Gbps, 10 Gbps, and 20 Gbps. Each of these bandwidth tiers is offered with four different packages along with bandwidth based, a la carte, advanced Layer 7 security services SKUs.

Table 136 describes the features available with the various license packages.

Table 136 vSRX Licensing Package Types

License Type	Description	Duration
STD	Includes the following features: 1. Core security – firewall, ALG, screens, user firewall 2. IPsec VPN (site-to-site VPN) 3. NAT 4. CoS 5. Multicast services – IP Multicast (PIM, IGMP) 6. Routing services – BGP, OSPF, DHCP, J-Flow, IPv4, and IPv6 7. High availability 8. Foundation – Static routing, management (J-Web, CLI, and NETCONF), on-box logging, diagnostics 9. Software platform – KVM, Openstack, ESXi 6.0, Contrail	Both perpetual and subscription license options are available.

License Type	Description	Duration
ASCB and ASECB	Includes all STD features bundled with the following additional AppSecure features: 1. AppID 2. AppFW 3. AppQoS 4. AppTrack	Subscription licenses only.
CS-B	Includes all STD features bundled with ASEC features and the addition of UTM capabilities: 1. Antispam 2. Antivirus 3. Content filtering 4. Web filtering	Subscription licenses only.
ATP-B	vSRX-1G-ATP-B bundle includes: 1. Sky ATP + 2. Content Security + 3. ASEC (IDP + AppFW) + 4. STD	A vSRX-1G-ATP-B-1 bundle includes: 1G Throughput, 1 year Subscription License for vSRX ATP package, including features in Content Security (CS) package, and SkyATP. This license is not supported for Contrail deployments.
Individual (a la carte) Advanced Security Services (ASEC, S-AV, W-EWF, CS)	Individual (a la carte) Layer 7 security services licenses including: 1. Sophos antivirus 2. Websense enhanced Web filtering 3. AppSecure and IPS 4. Content Security (CS)	Subscription licenses only.

License stacking is allowed. For example, to license 3 Gbps of throughput for the standard (STD) feature set for 1 year, use a VSRX-1G-STD-1 license and a VSRX-2G-STD-1.

Table 137 lists the standard bandwidth licenses available for vSRX.

Table 137 Standard (STD) vSRX Bandwidth Licenses

STD Licenses	Model Number
	VSRX-100M-STD
	VSRX-100M-STD-1
	VSRX-100M-STD-3
	VSRX-1G-STD
	VSRX-1G-STD-1
	VSRX-1G-STD-3
	VSRX-2G-STD
	VSRX-2G-STD-1
	VSRX-2G-STD-3
	VSRX-4G-STD
	VSRX-4G-STD-1
	VSRX-4G-STD-3
	VSRX-10G-STD
	VSRX-10G-STD-1
	VSRX-10G-STD-3
	VSRX-20G-STD
100M/1G/2G/4G/10G/20G throughput—vSRX standard package (1 year, 3 years, and perpetual)	VSRX-20G-STD-1
	VSRX-20G-STD-3

Table 138 lists the bandwidth licenses available for vSRX bundled with AppSecure and IPS features.

Table 138 vSRX AppSecure and IPS Bundled (ASCB and ASECB) Bandwidth Licenses

ASCB / ASECB Licenses	Model Number
	VSRX-100M-ASCB-1
	VSRX-100M-ASCB-3
	VSRX-1G-ASECB-1
	VSRX-1G-ASECB-3
	VSRX-2G-ASECB-1
	VSRX-2G-ASECB-3
	VSRX-4G-ASECB-1
	VSRX-4G-ASECB-3
	VSRX-10G-ASECB-1
100M/1G/2G/4G/10G/20G throughput—vSRX AppSecure package includes all features in the STD package with IPS and AppSecure (1-year or 3-year subscription)	VSRX-10G-ASECB-3
	VSRX-20G-ASECB-1
	VSRX-20G-ASECB-3

Table 139 lists the individual (a la cart) subscription licenses available for vSRX with AppSecure and IPS features.

Table 139 Individual vSRX AppSecure and IPS Subscription Licenses

ASEC Licenses	Model Number
	VSRX-100M-ASEC-1
	VSRX-100M-ASEC-3
	VSRX-1G-ASEC-1
	VSRX-1G-ASEC-3
	VSRX-2G-ASEC-1
	VSRX-2G-ASEC-3
	VSRX-4G-ASEC-1
	VSRX-4G-ASEC-3
	VSRX-10G-ASEC-1
	VSRX-10G-ASEC-3
100M/1G/2G/4G/10G/20G subscription—vSRX AppSecure package includes IPS and AppSecure (1-year or 3-year subscription)	VSRX-20G-ASEC-1
	VSRX-20G-ASEC-3

Table 140 lists the Content Security Bundled (CSB) bandwidth licenses available for vSRX.

Table 140 vSRX Content Security Bundled (CSB) Bandwidth Licenses

CS Licenses	Model Number
	VSRX-100M-CS-B-1
	VSRX-100M-CS-B-3
	VSRX-1G-CS-B-1
	VSRX-1G-CS-B-3
	VSRX-2G-CS-B-1
	VSRX-2G-CS-B-3
	VSRX-4G-CS-B-1
	VSRX-4G-CS-B-3
100M/1G/2G/4G/10G/20G throughput—vSRX CS package includes all features in STD, IPS, and AppSecure, enhanced Web filtering, Sophos antivirus, antispam, content filtering, (1-year or 3-year subscription).	VSRX-10G-CS-B-1
	VSRX-10G-CS-B-3
	VSRX-20G-CS-B-1
	VSRX-20G-CS-B-3

Table 141 lists the individual (a la carte) CS subscription licenses available for vSRX.

Table 141 vSRX Individual Content Security (CS) Subscription Licenses

CS Licenses	Model Number
	VSRX-100M-CS-1
	VSRX-100M-CS-3
	VSRX-1G-CS-1
	VSRX-1G-CS-3
	VSRX-2G-CS-1
	VSRX-2G-CS-3
	VSRX-4G-CS-1
	VSRX-4G-CS-3
	VSRX-10G-CS-1
100M/1G/2G/4G/10G/20G throughput—vSRX CS package includes enhanced Web filtering, Sophos antivirus, antispam, AppSecure and IPS (1-year or 3-year subscription).	VSRX-10G-CS-3
	VSRX-20G-CS-1
	VSRX-20G-CS-3

Table 142 lists the individual (a la carte) Sophos antivirus (S-AV) bandwidth licenses available for vSRX.

Table 142 vSRX Individual Sophos Antivirus (S-AV) Bandwidth Licenses

S-AV Licenses	Model Number
	VSRX-100M-S-AV-1
	VSRX-100M-S-AV-3
	VSRX-1G-S-AV-1
	VSRX-1G-S-AV-3
	VSRX-2G-S-AV-1
	VSRX-2G-S-AV-3
	VSRX-4G-S-AV-1
	VSRX-4G-S-AV-3
	VSRX-10G-S-AV-1
	VSRX-10G-S-AV-3
100M/1G/2G/4G/10G/20G throughput—vSRX S-AV license (1-year or 3-year subscription).	VSRX-20G-S-AV-1
	VSRX-20G-S-AV-3

Table 143 lists the individual (a la carte) enhanced Web filtering (W-EWF) subscription licenses available for vSRX.

Table 143 vSRX Individual Enhanced Web Filtering (W-EWF) Bandwidth Licenses

W-EWF Licenses	Model Number
	VSRX-100M-WEWF-1
	VSRX-100M-WEWF-3
	VSRX-1G-W-EWF-1
	VSRX-1G-W-EWF-3
	VSRX-2G-W-EWF-1
	VSRX-2G-W-EWF-3
	VSRX-4G-W-EWF-1
	VSRX-4G-W-EWF-3
	VSRX-10G-W-EWF-1
	VSRX-10G-W-EWF-3
100M/1G/2G/4G/10G/20G throughput—vSRX W-EWF license (1-year or 3 year subscription).	VSRX-20G-W-EWF-1
	VSRX-20G-W-EWF-3

Table 144 lists the remote access licenses you can purchase for vSRX.

Table 144 vSRX Remote Access Licenses

Remote Access Licenses	Model Number
Remote Access (5 Concurrent users, NCP)	vSRX-RA1-5
Remote Access (10 Concurrent users, NCP)	vSRX-RA1-10
Remote Access (25 Concurrent users, NCP)	vSRX-RA1-25
Remote Access (50 Concurrent users, NCP)	vSRX-RA1-50
Remote Access (100 Concurrent users, NCP)	vSRX-RA1-100
Remote Access (150 Concurrent users, NCP)	vSRX-RA1-150
Remote Access (250 Concurrent users, NCP)	vSRX-RA1-250
Remote Access (500 Concurrent users, NCP)	vSRX-RA1-500

Licenses for Advanced Threat Prevention

Licenses for JATP Advanced Threat Prevention Appliance

Licensing and Platform Support information

The following sections provide information on licensing requirements and SRX Series device platform support.

JATP and SRX Series Integration Licensing

Unlike other Layer 7 features, there is no separate license required on the SRX Series device for integration with JATP. In this deployment, the JATP Core is the licensed component. If the Core has a valid license, then the SRX Series device can connect to the Core and enroll successfully. If not, the enrollment will fail.

For JATP license upload instructions, see Setting the Juniper ATP Appliance License Key.

> **Note**: AppSecure functionality on the SRX Series device is a pre-requisite for integrating with JATP. Depending on the SRX Series platform, a separate license may be required to enable AppSecure. Please consult the SRX Series platform data sheet for the most accurate information.

Supported SRX Series Devices

This section describes the hardware and software components that are compatible with JATP.

Table 145 Supported SRX Series Devices

Platform	Hardware Requirements	Software Versions
vSRX Series		Junos 18.2R1 and above
SRX Series	SRX320, SRX300	Junos 18.3R1 and above
SRX Series	SRX4100, SRX4200, SRX4600	Junos 15.1X49-D65 and above for SRX4100 and SRX4200 Junos 17.4R1-S1 and above for SRX4600
SRX Series	SRX340, SRX345, SRX550m	Junos 15.1X49-D60 and above
SRX Series	SRX5800, SRX5600, SRX5400	Junos 15.1X49-D50 and above
SRX Series	SRX1500	Junos 15.1X49-D33 and above

The following devices support scanning SMTP e-mail attachments:

1. SRX300 Series device

2. SRX320 Series device

3. SRX340 Series device

4. SRX345 Series device

5. SRX1500 Series device

6. SRX4100 Series device

7. SRX4200 Series device

8. SRX4600 Series device

9. SRX5400 Series device

10. SRX5600 Series device

11. SRX5800 Series device

12. vSRX Series

The following devices support scanning IMAP e-mail attachments:

1. SRX300 Series device

2. SRX320 Series device

3. SRX340 Series device

4. SRX345 Series device

5. SRX1500 Series device

6. SRX4100 Series device

7. SRX4200 Series device

8. SRX4600 Series device

9. SRX5400 Series device

10. SRX5600 Series device

11. SRX5800 Series device

12. vSRX Series

Setting the Juniper ATP Appliance License Key

Without a valid product license key, the Juniper ATP Appliance system will not work. Likewise, an expired product key, or an expired support or content license, prevents full operations and disables content or software updates.

Use the Config>System Profiles>Licensing configuration window to upload a License key to the Juniper ATP Appliance or software service. To license your system, you will need to upload the license using this configuration window and also use the CLI to get the system UUID.

Note: License Keys are obtained from Juniper Customer Support.

Figure 10 Juniper ATP Appliance License Key
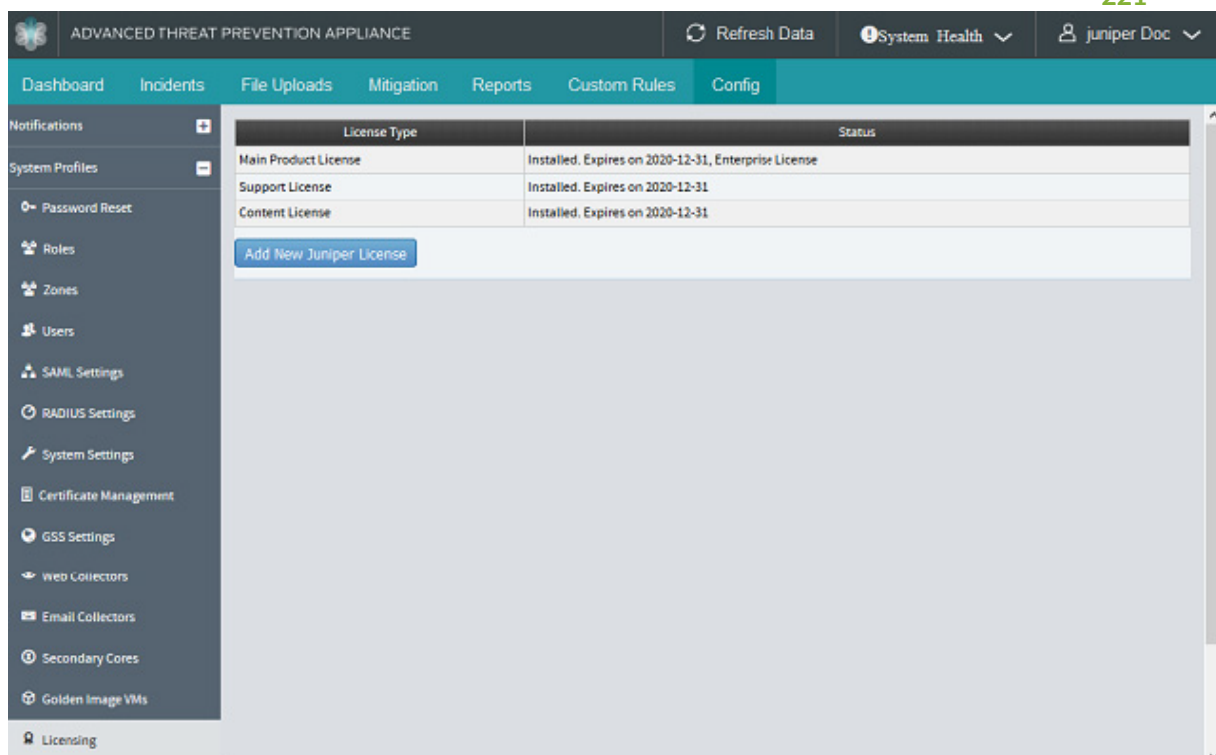
To upload a product license key:

1. Navigate to the Config>System Profiles>Licensing page.

2. Click Add New Juniper ATP Appliance License button to upload a new license key file.

3. Click the Choose File button to select the license key for upload, then click Submit to apply the configuration.

    Note: A GSS connection is required in order for Juniper ATP Appliance to run regular licensing checks. Adding a license manually does not enable JATPsupport.

Licenses for Juniper Advanced Threat Prevention Cloud (ATP Cloud)

Juniper Advanced Threat Prevention Cloud License Types

Juniper ATP Cloud has three service levels:

1. Free—The free model solution is available on all supported SRX Series devices (see the Supported Platforms Guide) and for customers that have a valid support contract, but only scans executable file types (see Juniper Advanced Threat Prevention Cloud Profile Overview). Based on this result, the SRX Series device can allow the traffic or perform inline blocking.

2. Basic (feed only)—Includes executable file scanning and adds filtering using the following threat feed types: Command and Control, GeoIP, Custom Filtering, and Threat Intel feeds. Threat Intel feeds use APIs that allow you to injects feeds into Juniper ATP Cloud.

3. Premium—Includes all features provided in the Free and Basic licenses, but provides deeper analysis. All supported file types are scanned and examined using several analysis techniques to give better coverage. Full reporting provides details about the threats found on your network.

Note: On the Enrolled Devices page in the Juniper ATP Cloud Web UI, the License Expiration column contains the status of your current license, including expiration information. There is a 60 day grace period after the license expires before the SRX Series device is disenrolled from Juniper ATP Cloud. On the SRX Series device, you can run the > `show system license` command to view license details.

Note: You do not need to download any additional software to run Juniper ATP Cloud.

Table 146 shows a comparison between the free model and the premium model.

Table 146 Comparing the Juniper ATP Cloud Free Model, Basic-Threat Feed, and Premium Model

Free Model	Basic-Threat Feeds Model	Premium Model
Management through cloud interface. Zero on-premise footprint beyond the SRX Series device. Also includes Encrypted Traffic Insight (ETI) and DNS security for: DGA and DNS tunnels.	Management through cloud interface. Zero on-premise footprint beyond the SRX Series device. Also includes Encrypted Traffic Insight (ETI) and DNS security for: DGA and DNS tunnels.	Management through cloud interface. Zero on-premise footprint beyond the SRX Series device. Also includes Encrypted Traffic Insight (ETI) and DNS security for: DGA and DNS tunnels.
Inbound protection.	Inbound protection.	Inbound protection.
Outbound protection.	Outbound protection.	Outbound protection.
—	C&C feeds.	C&C feeds.
—	GeoIP filtering.	GeoIP filtering.
	Custom feeds	Custom feeds
		Infected host feed/endpoint quarantine
	Threat Intelligence APIs only	All APIs including File/Hash
—	—	C&C protection with event data returned to the Juniper ATP Cloud.
—	—	Compromised endpoint dashboard.
—	—	DNS security

Free Model	Basic-Threat Feeds Model	Premium Model
—	—	Encrypted Traffic Insight (ETI)
Inspects only executable file types. Executables go through the entire pipeline (cache, antivirus, static and dynamic).	Inspects only executable file types. Executables go through the entire pipeline (cache, antivirus, static and dynamic).	No restrictions on object file types inspected beyond those imposed by the Juniper ATP Cloud service. You can specify which file types are sent to service for inspection.
Reporting with rich detail on malware behaviors.	Reporting with rich detail on malware behaviors.	Reporting with rich detail on malware behaviors.

For more information on analysis techniques, see How is Malware Analyzed and Detected?. For additional information on product options, see the Juniper ATP datasheet.

For more information on this and premium license SKUs, contact your local sales representative.
Additional License Requirements

AppSecure functionality on the SRX Series device is a pre-requisite for the Juniper Advanced Threat Prevention Cloud feature. Depending on the SRX Series platform, a separate license may be required to enable AppSecure. Please consult the SRX Series platform datasheet for the most accurate information.
Managing the Juniper Advanced Threat Prevention Cloud License

This topic describes how to install the Juniper ATP Cloud premium license onto your SRX Series devices and vSRX deployments. You do not need to install the Juniper ATP Cloud free license as these are included your base software. Note that the free license has a limited feature set (see Juniper Advanced Threat Prevention Cloud License Types and File Scanning Limits).

When installing the license key, you must use the license that is specific your device type. For example, the Juniper ATP Cloud premium license available for the SRX Series device cannot be used on vSRX deployments.
Obtaining the Premium License Key

The Juniper ATP Cloud premium license can be found on the Juniper Networks product price list. The procedure for obtaining the premium license entitlement is the same as for all other Juniper Network products. The following steps provide an overview.

1. Contact your local sales office or Juniper Networks partner to place an order for the Juniper ATP Cloud premium license.

   After your order is complete, an authorization code is e-mailed to you. An authorization code is a unique 16-digit alphanumeric used in conjunction with your device serial number to generate a premium license entitlement.

2. (SRX Series devices only) Use the `show chassis hardware` CLI command to find the serial number of the SRX Series devices that are to be tied to the Juniper ATP Cloud premium license.

```
[edit]
 root@SRX# run show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 CM1915AK0326      SRX1500
Midplane          REV 09   750-058562   ACMH1590          SRX1500
Pseudo CB 0
Routing Engine 0           BUILTIN      BUILTIN           SRX Routing Engine
FPC 0             REV 08   711-053832   ACMG3280          FEB
  PIC 0                    BUILTIN      BUILTIN           12x1G-T-4x1G-SFP-4x10G
```

Look for the serial number associated with the chassis item. In the above example, the serial number is `CM1915AK0326`.

3. Open a browser window and go to https://license.juniper.net.

4. Click **Login to Generate License Keys** and follow the instructions.

> **Note**: You must have a valid Juniper Networks Customer Support Center (CSC) account to log in.

License Management and SRX Series Devices

Unlike other Juniper Networks products, Juniper ATP Cloud does not require you to install a license key onto your SRX Series device. Instead, your entitlement for a specific serial number is automatically transferred to the cloud server when you generate your license key. It may take up to 24 hours for your activation to be updated in the Juniper ATP Cloud cloud server.

Juniper ATP Cloud Premium Evaluation License for vSRX

The 30-day Juniper ATP Cloud countdown premium evaluation license allows you to protect your network from advanced threats with Juniper ATP Cloud. The license allows you to use Juniper ATP Cloud premium features for 30-days without having to install a license key. After the trial license expires, the connection to the Juniper ATP Cloud cloud is broken and you will no longer be able to use any Juniper ATP Cloud features.

Instructions for downloading the trial license are here: https://www.juniper.net/us/en/dm/free-vsrx-trial/.

> **Note**: The 30-day trial license period begins on the day you install the evaluation license.
> To continue using Juniper ATP Cloud features after the optional 30-day period, you must purchase and install the date-based license; otherwise, the features are disabled.

After installing your trial license, set up your realm and contact information before using Juniper ATP Cloud. For more information, see Registering a Juniper Advanced Threat Prevention Cloud Account.

High Availability

Before enrolling your devices with the Juniper ATP Cloud cloud, set up your HA cluster as described in your product documentation. For vSRX deployments, make sure the same license key is used on both cluster nodes. When enrolling your devices, you only need to enroll one node. The Juniper ATP Cloud cloud will recognize this is an HA cluster and will automatically enroll the other node.

Troubleshooting Juniper Advanced Threat Prevention Cloud: Checking the application-identification License

If you are using an SRX1500 Series device, you must have a have a valid `application-identification` license installed. Use the `show services application-identification version` CLI command to verify the applications packages have been installed. You must have version 2540 or later installed. For example:

```
user@host> show services application-identification version
Application package version: 2540
```

If you do not see the package or the package version is incorrect, use the `request services application-identification download` CLI command to download the latest application package for Junos OS application identification. For example:

```
user@host> request services application-identification download
Please use command "request services application-identification download status"  to check status
```

Then use the `request services application-identification install` CLI command to install the downloaded application signature package.

```
user@host> request services application-identification install
Please use command "request services application-identification install status"  to check status
```

Use the `show services application-identification application version` CLI command again to verify the applications packages is installed.

Licenses for Network Management

Licenses for Junos Space

Viewing Licenses With Edge Services Director

Juniper Networks devices require a license to operate some features. You can view the licenses for devices connected to Edge Services Director.

To view the license for a Juniper Networks device on your network:

1. Select the **Build** icon in the Edge Services Director banner.
2. In the View pane, select a wireless or wired device.
3. In the Tasks pane, select **View License Information**.

   The Licenses page for that object is displayed with the fields listed in the Table 147.

Table 147 Viewing Licenses with Edge Services Director

Field	Description
Feature Name	Name of the licensed SKU or feature. It can be used to look up the license with Juniper Networks. Not all devices support this.
License Count	Number of times an item has been licensed. This value can have contributions from more than one licensed SKU or feature. Alternatively, it can be 1, no matter how many times it has been licensed.
Used Count	Number of times the feature is used. For some types of licenses, the license count will be 1, no matter how many times it is used. For capacity-based licensable items, if infringement is supported, the license count can exceed the given count, which has a corresponding effect on the need count.
Need Count	Number of times the feature is used without a license. Not all devices can provide this information.
Given Count	Number of instances of the feature that are provided by default.

If a device does not have a license, a blank page is displayed with the message, `No license is installed on this device.` If you are sure the device has a license, try resynchronizing the device before displaying the license again.

Optionally, expand the license information by feature name to view the feature SKU information. Table 148 describes the additional fields that are displayed.

Table 148 Additional Licensing Information

Field	Description
Validity Type	Validity type can be Databased (license expires on end date), Permanent, Countdown (license expires when time remaining is zero), or Trial. If the validity type is either Databased or Countdown, more information is displayed—License Name, License Version, License State, and Time Remaining. Additional information can be added in the details grid based on the SKU type (SKU or Feature)—Start Date, End Date, or Original Time Allowed.
License Name	If the validity type is either Databased or Countdown, the identifier associated with a license key is displayed.
License Version	If the validity type is either Databased or Countdown, the version of a license is displayed. The version indicates how the license is validated, the type of signature, and the signer of the license key.
License State	If the validity type is either Databased or Countdown, the state of the license is displayed—Valid, Invalid, or Expired.
Time Remaining	If the validity type is either Databased or Countdown, the remaining time left on the license is displayed. For a trial license, the number of days remaining after you installed the device is displayed. For a commercial license, the time remaining is unlimited.
Start Date	Based on the SKU type, the start date of the license can be displayed in the details grid.
End Date	Based on the SKU type, the end date of the license can be displayed in the details grid.
Original Time Allowed	Based on the SKU type, the original license timeframe can be displayed here.

If you apply a new license to an existing device, you must resynchronize the device before the new license is seen in Edge Services Director. For directions, see Resynchronizing Device Configuration.

Viewing Licenses With Connectivity Services Director

Juniper Networks devices require a license to operate some features. You can view the licenses for devices connected to Connectivity Services Director.

To view the license for a Juniper Networks device on your network:

1. Select the **Build** icon in the Connectivity Services Director banner.

2. In the View pane, select a device.

3. In the Tasks pane, select **View License Information**.

The Licenses page for that object is displayed with the fields listed in the Table 149.

Table 149 Viewing Licenses with Connectivity Services Director

Field	Description
Feature Name	Name of the licensed SKU or feature. It can be used to look up the license with Juniper Networks. Not all devices support this.
License Count	Number of times an item has been licensed. This value can have contributions from more than one licensed SKU or feature. Alternatively, it can be 1, no matter how many times it has been licensed.
Used Count	Number of times the feature is used. For some types of licenses, the license count will be 1, no matter how many times it is used. For capacity-based licensable items, if infringement is supported, the license count can exceed the given count, which has a corresponding effect on the need count.
Need Count	Number of times the feature is used without a license. Not all devices can provide this information.
Given Count	Number of instances of the feature that are provided by default.

If a device does not have a license, a blank page is displayed with the message, `No license is installed on this device.` If you are sure the device has a license, try resynchronizing the device before displaying the license again.

If you apply a new license to an existing device, you must resynchronize the device before the new license is seen in Connectivity Services Director. For directions, see Resynchronizing Device Configuration.

Viewing Licenses With Network Director

Juniper Networks devices require a license to operate some features. You can view the licenses for devices connected to Network Director.

To view the license for a Juniper Networks device on your network:

1. Select the **Build** icon in the Network Director banner.

2. In the View pane, select wired device.

3. In the Tasks pane, select **View License Information**.

The Licenses page for that object is displayed with the fields listed in the Table 150.

Table 150 Viewing Licenses with Network Director

Field	Description
Feature Name	Name of the licensed SKU or feature. It can be used to look up the license with Juniper Networks. Not all devices support this.
License Count	Number of times an item has been licensed. This value can have contributions from more than one licensed SKU or feature. Alternatively, it can be 1, no matter how many times it has been licensed.
Used Count	Number of times the feature is used. For some types of licenses, the license count will be 1, no matter how many times it is used. For capacity-based licensable items, if infringement is supported, the license count can exceed the given count, which has a corresponding effect on the need count.
Need Count	Number of times the feature is used without a license. Not all devices can provide this information.
Given Count	Number of instances of the feature that are provided by default.

If a device does not have a license, a blank page is displayed with the message, `No license is installed on this device`. If you are sure the device has a license, try resynchronizing the device before displaying the license again.

Optionally, expand the license information by feature name to view the feature SKU information. Table 151 describes the additional fields that are displayed.

Table 151 Additional Licensing Information

Field	Description
Validity Type	Validity type can be Databased (license expires on end date), Permanent, Countdown (license expires when time remaining is zero), or Trial. If the validity type is either Databased or Countdown, more information is displayed—License Name, License Version, License State, and Time Remaining. Additional information can be added in the details grid based on the SKU type (SKU or Feature)—Start Date, End Date, or Original Time Allowed.
License Name	If the validity type is either Databased or Countdown, the identifier associated with a license key is displayed.
License Version	If the validity type is either Databased or Countdown, the version of a license is displayed. The version indicates how the license is validated, the type of signature, and the signer of the license key.

Field	Description
License State	If the validity type is either Databased or Countdown, the state of the license is displayed—Valid, Invalid, or Expired.
Time Remaining	If the validity type is either Databased or Countdown, the remaining time left on the license is displayed. For a trial license, the number of days remaining after you installed the device is displayed. For a commercial license, the time remaining is unlimited.
Start Date	Based on the SKU type, the start date of the license can be displayed in the details grid.
End Date	Based on the SKU type, the end date of the license can be displayed in the details grid.
Original Time Allowed	Based on the SKU type, the original license timeframe can be displayed here.

Installing VCF Software Licenses

To install a VCF software license:

1. Purchase two VCF software license keys (QFX-VCF-LIC) from your Juniper Networks sales representative.

   The sales representative will provide you with the feature license files and license keys. You will be asked to supply the chassis serial number of your switch; you can obtain the serial number by issuing the `show virtual-chassis` command.

2. Install the first software license on one device in the VCF (for example, the device acting in the primary role):

   ```
   user@device> request system license add (filename | url)
   ```

3. Install the second software license on a second device in the VCF (for example, the device acting in the backup role):

   ```
   user@device> request system license add (filename | url)
   ```

Junos Space License Installation Overview

Junos Space Network Management Platform comes with a 60-day full-featured trial license. You must procure and install a valid license during this period to ensure continued operation beyond the trial period.

If you fail to upload a valid license during the 60-day trial period, the Junos Space user interface displays an error message when you log in indicating that the license has expired. Your access is limited to the

Licenses page (**Administration > Licenses**) from where you can execute the **Import License** task to enter a valid license.

For Junos Space Platform licensing details, see Generating and Uploading the Junos Space License Key File and Viewing Junos Space Licenses.

You can use either of the following options to install a valid license for Junos Space Platform:

1. If you plan to use the Junos Space Platform with only the Support Automation applications (Service Now and Service Insight), you can navigate to the **Add Organization** page (**Service Now > Administration > Organizations > Add Organization**) in the Service Now user interface to activate these applications. However, to activate these applications, you must have a valid support contract for your Juniper Networks devices and valid credentials to access the Juniper Support System (JSS) back end.

   If you choose this option and if you want to use other Junos Space applications beyond the trial period, you must purchase a license for Junos Space Platform (as explained in the bulleted item that follows).

2. If you want to use Junos Space applications other than Service Now and Service Insight, or if you do not have a valid support contract for your Juniper Networks devices, you must purchase a license for Junos Space Platform. After you obtain the license file, you can install the license from the **Import License** page (**Administration > Licenses > Import License**). For more information about installing a valid license for Junos Space Platform, see the Generating and Uploading the Junos Space License Key File topic (in the *Junos Space Network Management Platform* Workspaces Feature Guide).

Exporting the License Inventory

The Device Licence Inventory feature enables you to display the currently installed license inventory information for all DMI schema-based devices under Junos Space Network Management Platform management.

The license inventory is generated when the device is first discovered and synchronized in Junos Space Network Management Platform.

The licenses used by all Juniper Networks devices are based on SKUs, which represent lists of features. Each license includes a list of features that the license enables and information about those features. Sometimes the license information also includes the inventory keys of hardware or software elements upon which the license can be installed.

To view the license(s) for Junos Space Network Management Platform itself, see Viewing Junos Space Licenses.

This topic also covers:

1. Absence of license

2. Trial information

3. Count-down information

4. Date-based information

DMI enables each device family to maintain its own license catalog in the DMI Update Repository. The license catalog is a flat list of all the licenses used by a device family. The key for a license element is its SKU name. Each license element in the catalog includes a list of features that the license enables and information about each feature (that is, its name and value). Optionally, the license element can also list the inventory keys of hardware or software elements and where it can be installed.

If the license inventory on the device is changed, the result depends on whether the network is the system of record or Junos Space Network Management Platform is the system of record. See Systems of Record in Junos Space Overview.

If the network is the system of record, Junos Space Network Management Platform automatically synchronizes with the managed device. You can also manually resynchronize the Junos Space Network Management Platform license database with the device by using the Resynchronize with Network action. See Resynchronizing Managed Devices with the Network.

If Junos Space Network Management Platform is the system of record, neither automatic nor manual resynchronization is available.

Viewing device license inventory does not include pushing license keys to devices. You can, however, push licenses with the Configuration Editor to any device that has license keys in its configuration. You can export device license inventory information to a CSV file for use in other applications.

License inventory information shows individually installed licenses as well as a license usage summary, with statistics for various features.

To export the license inventory for a device:

1. On the Network Management Platform user interface, select **Devices > Device Management**.

   The Device Management page displays the devices managed in Junos Space Network Management Platform.

2. Select **Device Inventory > View License Inventory** from the Actions menu.

   The License Inventory page displays the license information listed.

   Need Counts in red indicate violations. In other words, entries in red indicate that you are using features that you are not licensed to use. You may also encounter the message that you have no licenses installed.

3. (Optional) View the list of licensed features for the selected license by double-clicking a license usage summary or clicking on the forward action icon to the left of a license usage summary.

4. (Optional) Click **Return to Inventory View** at the top of the inventory page.

5. (Optional) Click **Export** at the top of the inventory page, to export the license inventory information.

The Export Device License Information dialog box appears, displaying a link: Download license file for selected device (CSV format).

6. (Optional) Click the download link.

The Opening Device License-*xxxxxx*CSV dialog box appears, where *xxxxxx* represents a number.

7. Open the file with an application of your choice, or download the file by clicking **Save**.

The CSV file contains the fields described in the Table 152. These fields are not populated if the information is not available for the selected license.

Exporting device license information generates an audit log entry.

Table 152 License Usage Summary Fields

Field	Description
Feature name	Name of the licensed SKU or feature. It can be used to look up the license with Juniper Networks. Not all devices support this.
License count	Number of times an item has been licensed. This value may have contributions from more than one licensed SKU or feature. Alternatively, it may be 1, no matter how many times it has been licensed.
Used count	Number of times the feature is used. For some types of licenses, the license count will be 1, no matter how many times it is used. For capacity-based licensable items, if infringement is supported, the license count may exceed the given count, which has a corresponding effect on the need count.
Need count	Number of times the feature is used without a license. Not all devices can provide this information.
Given count	Number of instances of the feature that are provided by default.

Table 153 License Feature or SKU Fields

Field	Description
Feature Name	Name of the licensed SKU or feature. It can be used to look up the license with Juniper Networks. Not all devices support this.
Validity Type	The SKU or feature is considered permanent if it is not trial, count-down, or data-based.

Table 154 Additional Fields in CSV Files

Field	Description
State	Status of the license: valid, invalid, or expired. Only licenses marked as valid are considered when calculating the license count.
Version	Version of the license.
Type	Permanent, trial, and so on.
Start Date	Licensed feature starting date.
End Date	Licensed feature ending date.
Time Remaining	Licensed feature time remaining.

Juniper Connected Security for VMware NSX Licensing

VMware NSX is VMware's network virtualization platform for the Software Defined Data Center (SDDC). You can add the vSRX Virtual Services Gateway as a partner security service in the VMware NSX environment. The vSRX security service is managed by the Junos Space Security Director and VMware NSX Manager to deliver a complete and integrated virtual security solution for your SDDC environment. The vSRX provides advanced security services (Layer 7 services), including intrusion detection and prevention (IDP), and application control and visibility services through AppSecure.

The Juniper Connected Security for VMware NSX licensing includes support for Juniper's virtual firewall (vSRX), Network Security services (AppSecure, IDP) and the Juniper Connected Security and Security Management solutions (Policy Enforcer and Security Director) for VMware NSX-based private cloud advanced security.

Juniper Connected Security for VMware NSX Advanced Security Licenses

The Juniper Connected Security for NSX Advanced Security (ADS) licenses that are available from Juniper Networks provide entitlement for protection of one physical CPU socket, with one vSRX instance key provided for each license. Typically, a VMware ESXi server has multiple CPU sockets, and each CPU socket has multiple cores.

All Juniper Connected Security for NSX ADS licenses have an associated time duration; you purchase licenses as subscription based for a 1-year, 3-year, or 5-year duration.

A Juniper Connected Security for NSX ADS license cannot be purchased as a perpetual (never expire) license. Each license is only available on a subscription basis.

Each license includes support for the following:

1. Juniper vSRX Series Virtual Services Gateway, including:

    1. Stateful L3-L4 firewall

    2. Advanced Application Security (ASEC) features (such as AppID, AppFW, AppQoS, and AppTrack)

    3. Intrusion Detection and Prevention (IDP)

4. Juniper Security Management solutions, including:

    1. Junos Space Security Director

    2. Juniper Connected Security Policy Enforcer

The licenses available in the Juniper Connected Security for VMware NSX ADS licensing model are based on SKUs which represent the terms of subscription and the supported features.

Table 155 describes the various license packages.

Table 155 Juniper Connected Security for VMware NSX ADS Licensing Packages

License Model Number	Description
JNSX-ADS-1-1Y	Juniper Connected Security for NSX Advanced Security with vSRX for 1 physical CPU socket - 1 Year Subscription The 1 year subscription license includes support for Security Director, Policy Enforcer, 1 vSRX entitlement for 1 physical CPU socket protection with AppSecure and IDP feature support
JNSX-ADS-1-3Y	Juniper Connected Security for NSX Advanced Security with vSRX for 1 physical CPU socket - 3 Year Subscription The 3 year subscription license includes support for Security Director, Policy Enforcer, 1 vSRX entitlement for 1 physical CPU socket protection with AppSecure and IDP feature support
JNSX-ADS-1-5Y	Juniper Connected Security for NSX Advanced Security with vSRX for 1 physical CPU socket - 5 Year Subscription The 5 year subscription license includes support for Security Director, Policy Enforcer, 1 vSRX entitlement for 1 physical CPU socket protection with AppSecure and IDP feature support

License Duration

The Juniper Connected Security for NSX ADS license model is subscription based. A subscription license is an annual license that allows you to use the licensed software for the matching duration.

Subscriptions might involve periodic downloads of content (such as for IDP threat signature files). At the end of the license period, you need to renew the license to continue using it.

Subscription licenses start when you retrieve the license key or 30 days after purchase if you have not retrieved the license key. All subscription licenses are renewable.

License Procurement and Installation

To enable a Juniper Connected Security for NSX ADS license, you must purchase, install, and manage the license key that corresponds to the specific terms of each license. The presence of the appropriate software unlocking key on your virtual instance allows you to configure and use that license.

Licenses are usually ordered when the software application is purchased, and this information is bound to a customer ID. If you did not order the licenses when you purchased your software application, contact your account team or Juniper Networks Customer Care for assistance. Licenses can be procured from the Juniper Networks License Management System (LMS).

From the Junos Space Security Director you discover the NSX Manager and perform service registration of the vSRX VM with the NSX Manager. The NSX Manager is added as a device in Security Director and its inventory is synchronized with Security Director. Discovering the NSX Manager and registering vSRX as a security service in Security Director are described in detail in Deploying the vSRX as an Advanced Security Service in a VMware NSX Environment.

As part of the service registration procedure, in the Service Manager Registration section of the Add NSX Manager page, you enter the license key (see Figure 11).

Figure 11 Service Manager Registration: Entering the License Key

Licenses for Network and Security Manager (NSM)

Installing Advanced License Keys

To access the IDP functionality on a security module, you must install both an Advanced license key and an IDP license key on the security device. For details on obtaining and installing a license key.

Installing the IDP license key disables the Deep Inspection (DI) feature.

Managing License Keys (ScreenOS Only)

Some security devices support the activation of optional features or the increased capacity of existing features through the installation of license keys. You must first obtain a license key from your value-added reseller (VAR) or from Juniper Networks. Then you can use the NSM UI to install the license key on the managed device.

After you have installed the license key on the device, the device can begin to use the new feature immediately. However, because the information in the license key is decoded only after it has been installed on the device, you must import the license key information from the device into the NSM system before the new feature appears in the UI. Importing license keys from the device can also resolve any license key mismatches between NSM and the managed device.

Installing License Keys on a Device

To obtain a license key:

1. Contact the value-added reseller (VAR) who sold you the security device, or contact Juniper Networks directly.

2. Provide the serial number of your device and state the feature option you want. The license key is generated and then sent to you in an e-mail message.

To install the license key on a device using the NSM UI:

1. In the main navigation tree, right-click the device on which you want to install the license key and select **Admin** > **Install License Key**. The Install License Key dialog box appears.

2. Either copy and paste the license key into the dialog box, or click the **Browse** button to locate the license key file on your computer.

3. Click **OK**.

Importing License Key Information into NSM

After you install a new license key on a device, either through the NSM UI or locally (through the Web UI or CLI) you must import that license key information into the NSM system.

Importing license key information from a device also enables you to quickly view all license keys installed on a device, and the features and capacities available on the device.

To import or view license key information:

1. In the main navigation tree, right-click the device on which you want to install the licence key and select **Admin** > **Import License Key Info**.

2. Click **Yes** at the confirmation dialog box. The Job Information window displays the license key information.

Installing Trial License Keys

A trial license key allows you to view and evaluate NSM before purchasing the subscription. You can install a trial license on NSM which allows you to add up to 6025 devices on a software installation and 525 devices on an appliance setup. You can choose trial periods of 30, 60 and 90 days.

The **Expires in (Days)** field in the **NSM License Information** window shows the status of your license. When you install a trial license, NSM displays a warning that your license expires in **X** number of days. When your license expires, NSM notifies you that your trial period is over and prompts you to install a new license. You can proceed with the NSM GUI log in only after the installation of a valid permanent license.

Generating the NSM License Key File

In Release 2007.3 and later releases, the NSM product line uses a licensing mechanism to prevent access to an unlicensed copy of NSM and to enforce a limit on the maximum number of devices that can be managed by NSM. New installations and installations upgrading from a release prior to 2007.3 must obtain a license to use NSM.

The base license supports 25 devices with high availability (HA), including devices running ScreenOS, IDP, or Junos OS with Enhanced Services; EX Series, Secure Access, or Infranet Controller devices; and including any modeled or vsys devices. For details on these devices, see the *Network and Security Manager Administration Guide.*

To manage more than 25 devices, a license key must be purchased separately, retrieved from the Juniper License Management Server (LMS), and then installed onto the NSM Server or NSM appliance.

LMS provides an interface to generate licenses based upon serial number, authorization code and installation ID.

Procedures provided in the following sections use the NSM installer to generate the installation ID. Alternatively, you can download a utility from the Juniper Networks Software Download site for generating the installation ID.

Installing NSM for the First Time

The first time you install NSM 2007.3 or later release software only, you need to generate a license key file that requires an installation ID.

NSM Trial Licenses

You can generate a trial license for NSM for periods of 30, 60 or 90 days. The **NSM License Information** dialog box displays the validity period in the **Expires in (Days)** field. Licenses can only be installed or updated from the NSM GUI. When the trial period is over, NSM notifies you and prompts you to install a new license. If you install the new license, you can proceed to log in to NSM. If not, you must exit from the GUI.

Generating the License Key for an NSM Software-Only Installation

To generate the license key file for an NSM 2007.3 or later software-only installation:

1. Run the NSM installer image on the server designated for NSM. The NSM Server generates an installation ID.

2. Log in to the LMS system and select **License key generation** for NSM.

3. Enter the serial number and authorization code.

   Your serial number is printed on the paper license certificate given to you when you purchased NSM.

   Depending on the package you purchased, Juniper Networks provides an authorization code by e-mail. If you received a paper license certificate, and are managing more than 25 devices, call Juniper Networks Customer Service. The Customer Service will validate your purchase and generate a license key file.

4. Enter the installation ID that was generated by the NSM Server.

   The LMS system generates a license key file for the SKU recorded. You can choose to download the license key file, or to receive it by e-mail.

5. Save the license key file to your local drive for use during installation.

Generating the License Key for an NSM Appliance Installation

To generate the license key file for an NSM appliance installation:

1. Log in to the LMS system and select **License key generation** for NSM.

2. Enter the serial number and authorization code.

   The serial number is on the back of the NSM appliance chassis.

   Depending on the package you purchased, Juniper Networks provides an authorization code via e-mail. If you received a paper license certificate, and are managing more than 25 devices, call Juniper Networks Customer Service. Customer Service will validate your purchase and generate a license key.

The LMS system generates a license key file for the SKU recorded. You can choose to download the license key file, or to receive it by e-mail.

3. Save the license key file to your local drive for use during installation.

Generating the License Key for a High Availability NSM Installation

To generate the license key file for an NSM 2007.3 or later HA installation:

1. Run the NSM installer image on the server designated as your primary NSM (or primary GUI server). The NSM Server generates an installation ID.

2. Run the NSM 2007.3 or later installer image on the server designated as your secondary NSM (or secondary GUI server). The NSM Server generates an installation ID.

3. Log in to the LMS system and select **License key generation** for NSM.

4. Enter the serial number and authorization code of your primary NSM.

   For an NSM appliance installation, enter the serial number of the primary server. The hardware serial number is located on the back of the NSM appliance chassis.

   For a software-only installation:

   1. Enter the serial number.

      The serial number of your software is printed on the paper license certificate given to you when you purchased NSM. If you do not have the software serial number or the LMS System fails to recognize the serial number, call Juniper Networks Customer Service.

   2. Enter the installation ID of the primary NSM.

   Depending on the package you purchased, Juniper Networks provides an authorization code via e-mail. If you received a paper license certificate, and are managing more than 25 devices, call Juniper Networks Customer Service. Customer Service will validate your purchase and generate a license key.

3. Select the **Need High Availability Key** check box. The LMS systems prompts you to provide the NSM Secondary serial number and Secondary Installation ID.

   The LMS system generates a license key file for the SKU recorded. You can choose to download the file, or to receive it by e-mail.

4. Save the license key file to your local drive for use during installation.

Upgrading to an NSM Release that Requires a License

When you upgrade to an NSM 2007.3 or later release from a version that is older than 2007.3, you need to generate a license key file that requires an installation ID.

Generating the License Key for an NSM Software-Only Upgrade

To generate the license key file to upgrade to NSM 2007.3 or later release:

1. Run the NSM installer image on the server designated for NSM. The NSM Server generates an installation ID.

2. Log in to the LMS system and select **License key generation** for NSM.

3. Enter the serial number and authorization code.

   Your serial number is printed on the paper license certificate given to you when you purchased NSM. If you do not have the serial number or the LMS System fails to recognize the serial number, call Juniper Networks Customer Service.

   Depending on the package you purchased, Juniper Networks provides an authorization code via e-mail. If you received a paper license certificate, and are managing more than 25 devices, call Juniper Networks Customer Service. The Customer Service will validate your purchase and generate a license key.

4. Enter the installation ID that was generated by the NSM Server.

   The LMS system generates a license key file for the SKU recorded. You can choose to download the file or to receive it by e-mail.

5. Save the license key file to your local drive for use during installation.

The NSM upgrade to 2007.3 or later release will not proceed without the license key file if NSM manages more than 25 devices.

Generating the License Key for an NSM Appliance Upgrade Installation

To generate the license key file to upgrade an NSM appliance:

1. Log in to the LMS system and select **License key generation** for NSM.

2. Enter the hardware serial number and authorization code.

   The hardware serial number is located on the back of the NSM appliance chassis.

   Depending on the package you purchased, Juniper Networks provides an authorization code via e-mail. If you received a paper license certificate, and are managing more than 25 devices, call Juniper Networks Customer Service. Customer Service will validate your purchase and generate a license key.

   The LMS system generates a license key file for the SKU recorded. You can choose to download the file or to receive it by e-mail.

3. Save the license key file to your local drive for use during installation.

The NSMXpress upgrade to 2007.3 or later release will not proceed without the license key file if NSM manages more than 25 devices.

Generating the License Key File for an NSM 2007.3 or Later High Availability Upgrade Installation

To generate the license key file to upgrade to NSM 2007.3 or later release with high availability:

1. Run the NSM installer image on the server designated as your primary NSM (or primary GUI server). The NSM Server generates an installation ID.

2. Run the NSM 2007.3 or later installer image on the server designated as your secondary NSM (or secondary GUI server). The NSM Server generates an installation ID.

3. Log in to the LMS system and select **License key generation** for NSM.

4. Enter the serial number and authorization code of your primary NSM.

   For an NSM appliance installation, enter the serial number of the primary server. The hardware serial number is located on the back of the NSM appliance chassis.

   For a software-only installation:

   1. Enter the serial number.

      The serial number of your software is printed on the paper license certificate given to you when you purchased NSM. If you do not have the software serial number or the LMS System fails to recognize the serial number, call Juniper Networks Customer Service.

   2. Enter the installation ID of the primary NSM.

   Depending on the package you purchased, Juniper Networks provides an authorization code via e-mail. If you received a paper license certificate, and are managing more than 25 devices, call Juniper Networks Customer Service. Customer Service will validate your purchase and generate a license key.

3. Select the **Need High Availability Key** check box. The LMS systems prompts you to provide the NSM Secondary serial number and Secondary Installation ID.

   The LMS system generates a license key file for the SKU recorded. You can choose to download the file, or to receive it by e-mail.

4. Save the license key file to your local drive for use during installation.

The NSM upgrade to 2007.3 or later release will not proceed without the license key file if NSM manages more than 25 devices.

Example of an NSM License File

```
-----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA1

NSM License File (v1)
Generated on Thu Sep 20 19:11:08 IST 2007

This license file is for:
 Serial Number: 0000000 Installation ID: 200003AC65C52
 Serial Number: 00000 Installation ID: ID-2

This license file enables the following features:
 High-Availability: Enabled
 Max-Device: 100
 Evaluation-Mode: P30D

This license file reflects the following SKUs:
                             NS-SM-ADD-50
                     NS-SM-ADD-50

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.2.6 (GNU/Linux)

iQCVAwUBRvJ4dCNvzN729P/TAQI+rgQAoG7fGLDh9vCFxbjeMrCGp+zd1AZ0KUxp
7xOrhIZnuT9urbumyQq9ySO3ovFjXzTJbiIbncmj6IUh4bkfKpu9H4WIu5qrsBvK
iRHzGJFMBcSCCleqV0TTBZVF82wblwy+RjWLhW71EHKtU46mVPSYQvy9vZKu/AZf
TwQ3So2hRqg=
=DTk4
-----END PGP SIGNATURE-----
```

If your downloaded license key file has any extra lines before "-----BEGIN PGP SIGNED MESSAGE-----"
or after "-----END PGP SIGNATURE-----", delete those lines before installing the license key file.
Installing the License Key File in Various Configurations

Instructions for installing the license key are included in the various installation chapters.
Upgrading the License Key

License upgrades can be purchased at any time for any supported product. After purchasing a license
upgrade, you receive a Right to Use (RTU) certificate containing an authorization code that allows you
to log in to the LMS system and generate a permanent license key that can be applied to the NSM
product.

Viewing License Key Information

You can view key information about licenses, in the **NSM License Information** window. From the menu bar, select**Tools** > **NSM License Information** to view this information

Enforcing Licenses

The maximum number of devices allowed for NSMXpress appliance installations is 525. The maximum number of devices allowed for NSM software-only installations is 6025. These numbers include all modeled devices, vsys devices, and cluster devices.

Each cluster member of a cluster device counts as one device.

Even though the SKU installation is cumulative, NSM restricts the maximum number of manageable devices. NSM rejects the application for a license when the maximum device supported limit is reached for both appliance and software installations.

If you add a device after the number of devices added reaches 90 percent of the license limit, a warning message appears. If you try to add an extra device after the maximum limit is reached, a dialog box appears with the message "Maximum number of supported devices is reached." You are not allowed to add devices after reaching the license limit. you must purchase an upgrade before adding more devices.

Licensing FAQ

Table 156 answers frequently asked questions about NSM licensing.

Table 156 Licensing FAQ

Question	Answer
Which device types does NSM count towards the total device count?	NSM counts each single addition of a firewall, IDP, router, switch, Secure Access, or Infranet Controller device as one device. Each cluster member counts as one device. Each vsys device added to a firewall root device counts as one device.
Does NSM Central Manager (NS-SM-A-CM) require a license key file?	The NSM Central Manager does not require a license key file for installation. Enforcement is built into the product.
Are there any differences in licenses for an NSM appliance and software-only installations?	No. Both follow the same licensing scheme, but their installation methods are different. NSM software version uses the NSM Installer to install the new license. An NSM appliance uses the Web UI to install the license. A license can also be installed via the NSM UI after the base installation is completed.

Question	Answer
What is the procedure to add a new license after the device count limit is reached?	License upgrades can be purchased at any time for any supported product. After purchasing a license upgrade, you receive a Right to Use (RTU) certificate containing an authorization code that allows you to log in to the LMS system and generate a permanent license key that can be applied to the NSM product. License key updates can then be applied from NSM GUI from **Tools > NSM License Information**.
I already have NSM installed in my network. I have more than 25 devices installed on NSM. Do I need a license key file to upgrade to 2007.3 or later release?	Yes, if you are upgrading from a release that is older than 2007.3.
What is the procedure to obtain the license key file?	For new installations, see "Installing NSM for the First Time" on page 239. For upgrades, see "Upgrading to an NSM Release that Requires a License" on page 241.
I don't have an NSM Serial number available. What do I do?	Call Juniper Networks Customer Service.

Licenses for J-Web Device Manager

Managing Licenses for the EX Series Switch (J-Web Procedure)

This topic applies only to the J-Web Application package.

To enable and use some Junos OS features on an EX Series switch, you must purchase, install, and manage separate software licenses. Each switch requires one license. For a Virtual Chassis deployment, two licenses are recommended for redundancy. After you have configured the features, you see a warning message if the switch does not have a license for the feature.

Before you begin managing licenses, be sure that you have:

1. Obtained the needed licenses. For information about how to purchase software licenses, contact your Juniper Networks sales representative.

2. Understand what makes up a license key. For more information, see *License Key Components for the EX Series Switch*.

This topic includes the following tasks:
Adding New Licenses

To add one or more new license keys on the switch, with the J-Web license manager:

1. In the J-Web interface, select **Maintain** > **Licenses**.
2. Under Installed Licenses, click **Add** to add a new license key or keys.
3. Do *one* of the following, using a blank line to separate multiple license keys:

   1. In the License File URL box, type the full URL to the destination file containing the license key or keys to be added.

   2. In the License Key Text box, paste the license key text, in plain-text format, for the license to be added.

3. Click **OK** to add the license key or keys.

A list of features that use the license key is displayed. The table also lists the ID, state, and version of the license key.
Deleting Licenses

To delete one or more license keys from a switch with the J-Web license manager:

1. In the J-Web interface, select **Maintain** > **Licenses**.
2. Select the check box of the license or licenses you want to delete.
3. Click **Delete**.
Displaying License Keys

To display the license keys installed on a switch with the J-Web license manager:

1. In the J-Web interface, select **Maintain** > **Licenses**.
2. Under Installed Licenses, click **Display Keys** to display all the license keys installed on the switch.

A screen displaying the license keys in text format appears. Multiple licenses are separated by a blank line.
Downloading Licenses

To download the license keys installed on the switch with the J-Web license manager:

1. In the J-Web interface, select **Maintain** > **Licenses**.
2. Under Installed Licenses, click **Download Keys** to download all the license keys installed on the switch to a single file.
3. Select **Save it to disk** and specify the file to which the license keys are to be written. You can also download the license file to your system.

Licenses for Contrail Service Orchestration

Licenses for Contrail Service Orchestration

About the Device License Files Page

To access this page, click **Administration > Licenses> Device Licenses**.

You can use the Device License Files page to upload licenses for devices and virtual network services from your local file system. Each device license file should contain only one license key. A license key is required to enable various features including virtual network services such as application-based routing, application monitoring, and vSRX security features.

Tasks You Can Perform

You can perform the following tasks from this page:

1. Add device license files. See Uploading a License File.

2. Edit and delete device license entries. See "Editing and Deleting Device Licenses" on page 249.

3. Push licenses to devices. See "Pushing a License to Devices" on page 250.

4. View details of a device license. Click the details icon that appears when you mouse over the row for each license file or click **More > Details**. See Viewing Object Details.

5. Show or hide columns about the device license files.

6. Sort the device license files. See Sorting Objects.

7. Search an object about the device license files. See Searching for Text in an Object Data Table.

Field Descriptions

Table 157 describes the fields on the License Files page.

Table 157 Fields on the License Files Page

Field	Description
File Name	Displays the filename of the license. Example: license_Image_v1.txt
Description	Displays the description of the license. Example: License file for application routing.

Field	Description
Tenant	Displays the name of the tenant if the license is associated with a tenant. Example: Tenant 1
Uploaded By	Displays the administrator who uploaded the license. Example: test_admin
Uploaded	Displays the date and time when the license was uploaded. Example: Jun 5, 2018, 12:41:08 PM
Devices	Displays the number of devices to which the license is pushed. Click the number to view the devices to which the license is pushed.

Uploading a Device License File

To upload a device license file:

1. Click **Administration > Licenses > Device Licenses**.

   The Device License Files page appears.

2. Click the plus icon (+).

   The Add Device Licenses page appears.

3. In the Device License File field, specify the location of the license file that you want to upload. Alternatively, you can click Browse to navigate to the file location and select the file.

   Note: Each license file should contain only one license key.

4. (Optional) From the Tenants list, select the tenant to which you want to associate the license file.

   If you associate a license with a tenant, you can apply that license only to devices that belong to that tenant. If a tenant has licenses associated with the tenant, when a device is activated during ZTP, a matching license from the licenses associated with the tenant is downloaded to the device.

   You can apply a license that is not associated with a tenant to any device of any of the tenants. During ZTP, when a device is activated for a tenant that does not have any license associated with it, a matching license from the licenses that are not associated with any tenant is downloaded to the device.

5. In the Description field, enter a description for the license that you want to upload.

6. Click **OK** to upload the license.

   You are returned to the Device License Files page.

Editing and Deleting Device Licenses

The following sections describe the procedure for editing and deleting uploaded device licenses:

Editing a Device License Entry

You can edit a device license entry to modify the description for the license file.

1. Click **Administration > Licenses > Device Licenses**.

   The Device License Files page appears.

2. Select the device license for which you want to modify the description and click the Edit icon.

   The Update Device License page appears.

3. Update the description.

4. Click **OK** to save the changes. To discard the changes, click **Cancel**.

   If you click **Cancel**, a confirmation message appears. Click **Yes** to confirm that you want to cancel the update.

Deleting a Device License

To delete a device license:

1. Click **Administration > Licenses > Device Licenses**.

   The Device License Files page appears.

2. Select the device license that you want to delete and click the delete icon.

3. In the confirmation message, click **Yes** to delete the device license.

   To cancel the delete operation, click **No**.

Pushing a License to Devices

You can push licenses on to devices from the Licenses page of the Administration portal. If a license is associated with a tenant, you can push that license only to devices associated with that tenant. However, if no tenant is associated with a license, you can apply the license to any device that belongs to any tenant.

When a license is applied to a device, the license information is added to the device object. When the same license is pushed to the device again, a device-level error message is created. Similarly, if a pushed license does not match a device, the device generates an error message.

To push a license to a device:

1. Click **Administration > Licenses > Device Licenses**.

   The License Files page appears.

2. Select the license that you want to push to a device.

   The **Push License** button is enabled.

3. Click the **Push License** button.

The Push License page appears.

4. From the Tenants list, select the tenant associated with the site and devices to which you want to apply the license.

> **Note**: If the license has already been associated with a tenant, you cannot select a different tenant. You can apply the license only to the sites and devices associated with the tenant.

Sites and devices associated with the selected tenant appear.

5. Select the sites and devices to which you want to apply the license and click **Push Licenses**.

CSO applies the license to the selected devices.

About the CSO Licenses Page

To access this page, click **Administration > Licenses > CSO Licenses**.

Users with the OpCo Administrator role can use the CSO Licenses page to view information about the CSO licenses issued by the SP administrator, assign the licenses to one or more tenants, and update or unassign license assignments.

Tasks You Can Perform

You can perform the following tasks from this page:

1. Assign CSO licenses to one or more tenants—See "Assign CSO Licenses, and Update or Unassign CSO License Assignments" on page 253.

2. View the tenants previously assigned to a CSO license—Click *assigned-number* corresponding to a license. The View Assigned page appears displaying the tenants and quantity assigned to each tenant.

3. Update or unassign CSO license assignments—See "Assign CSO Licenses, and Update or Unassign CSO License Assignments" on page 253.

4. Search for CSO licenses by using keywords—Click the search icon and enter the search term in the text box and press Enter. The search results are displayed on the same page.

You can search using license SKU, sales order, type, tier, or device class.

5. Sort CSO licenses—Click a column name to sort based on the column name.

> **Note**: Sorting is applicable only to some fields.

6. Show or hide columns—Click the **Show Hide Columns** icon at the top right corner of the page and select the columns that you want displayed on the CSO Licenses page.

Field Descriptions

Table 158 describes the fields on the CSO Licenses page.

Table 158 Fields on the CSO Licenses page

Field	Description
License SKU	Displays the license SKU name; for example, S-CSO-C-S1-A-3.
Sales Order	Sales order number; for example, 15563238.
Type	Type of site—on-premise or cloud.
Tier	Support tier associated with the license; for example, Standard.
Device Class	Class of the Juniper device associated with the license; for example, B-class.
SSRN	Software support reference number, which is necessary to identify your purchase order when you contact Juniper Networks for support
Start Date	Date (in MMM DD , YYYY format) from which the license is valid; for example, Aug 29, 2019.
End Date	Date (in MMM DD , YYYY format) up to which the license is valid. CSO calculates the end date based on the validity of the license SKU.
Device Quantity	Total number of devices (that the tenant can add) that you can assign for a license.
Available	Available number of devices (that the tenant can add) that you can assign to tenants.
Assigned	Number of devices (that the tenant can add) that are already assigned to one or more tenants: 1. Click *assigned-number* to view the tenants and quantity assigned for each tenant. The View Assigned page appears displaying the tenants and quantity assigned to each tenant. 2. If the CSO license is not assigned to any tenants, click **Assign** to assign the license to one or more tenants. See "Assign CSO Licenses, and Update or Unassign CSO License Assignments" on page 253.

Assign CSO Licenses, and Update or Unassign CSO License Assignments

Users with the Operating Company (OpCo) Administrator role can:

1. Assign a CSO license to one or more tenants.

2. Update the assignment of a CSO license that was previously assigned to one or more tenants.

3. Unassign a CSO license that was previously assigned to a tenant.

Assign CSO Licenses to Tenants

To assign a CSO license that is not yet assigned to a tenant:

1. Select **Administration** > **Licenses** > **CSO Licenses**.

   The CSO Licenses page appears.

2. Click the **Assign** link corresponding to the license that you want to assign (in the Assigned column).

   The Assign CSO License page appears.

3. Configure the fields according to the guidelines provided in Table 159.

4. Click **Assign**.

   CSO validates the quantities that you assigned against the total quantity for the license:

   1. If the sum of assigned quantities is greater than the total quantity, an error message is displayed. You must then modify the assigned quantities to proceed.

   2. If the sum of assigned quantities is less than or equal to the total quantity, a job is triggered. You are returned to the CSO Licenses page and a confirmation message is displayed on the top of the page. After the job completes successfully, the CSO Licenses page displays the updated information in the Available and Assigned columns.

Table 159 Fields on the Assign CSO License page

Field	Description
License Information	Displays the following information for the license: 1. Sales Order 2. License SKU 3. Start Date
License Assignment	
Device Quantity	Displays the total quantity that can be assigned to tenants.

Field	Description
Available	Displays the available quantity that can be allocated to tenants.
Tenants List	To assign the license to one or more tenants: 1. Click the **+** icon. A row is added in the grid and selected. 2. In the **Tenant** column, select the tenant to which you want to assign the license. 3. In the **Device Quantity** column, enter the quantity that you want to assign to the tenant. 4. Click √ (check mark) to save your changes. 5. (Optional) Click the pencil icon to modify the tenant name or the quantity and click √ (check mark) to save your changes. 6. (Optional) Repeat the steps if you want to assign the license to additional tenants.

Update or Unassign CSO License Assignments

For a CSO license that is already assigned to one or more tenants, to update or unassign the license assignment:

1. Select **Administration** > **Licenses** > **CSO Licenses**.
   The CSO Licenses page appears.

2. Select the license for which you want to update or unassign the license assignment and click the **Update Assignment** button.
   The Assign CSO License page appears.

3. From the list of tenants displayed in the grid, select the tenant (row) and do one of the following:

   1. To update the license assignment:

      1. Click the edit (pencil) icon.

      2. In the **Device Quantity** column, modify the device quantity.

      3. Click √ (check mark) to save your changes.

         The modification that you made is displayed in the grid.

   4. To unassign the license assignment:

      1. Click the delete (trash can) icon.

         A popup appears asking you to confirm the unassign operation.

2. Click **Yes**.

   The license is unassigned from the tenant that you selected and the tenant is removed from the grid.

3. (Optional) If the available quantity is non-zero, you can assign the license to additional tenants.

4. Click **Assign**.

   CSO validates the modifications against the total device quantity for the license:

   1. If the sum of assigned quantities is greater than the total quantity, an error message is displayed. You must then modify the assigned quantities to proceed.

   2. If the sum of assigned quantities is less than or equal to the total quantity, a job is triggered and you are returned to the CSO Licenses page. A confirmation message is displayed on the top of the page.

      After the job completes successfully, the CSO Licenses page displays the updated information in the Available and Assigned columns.

# Licenses for Steel-Belted Radius Carrier

Obtaining License Keys

You must have a unique single-seat software license key for each server installation and for each optional module that you want to activate.

If you are installing Session State Register, you need a license for each SBR Carrier server, each optional module, and a Starter Kit license—a single number that is used on all four servers in the Starter Kit cluster. If you are installing more nodes than in the Starter Kit, each additional SBR Carrier server, Expansion Kit, and Management Node kit require unique licenses.

When a license for the base product or an optional module is purchased, a certificate containing an authorization code is issued. Use the authorization code to generate a license key on the Juniper Networks support server.

1. Go to https://www.juniper.net/lcrs/license.do. You may be prompted to log in.

2. On the Manage Product Licenses screen, select SBR Carrier from the drop-down list and click **Go**.
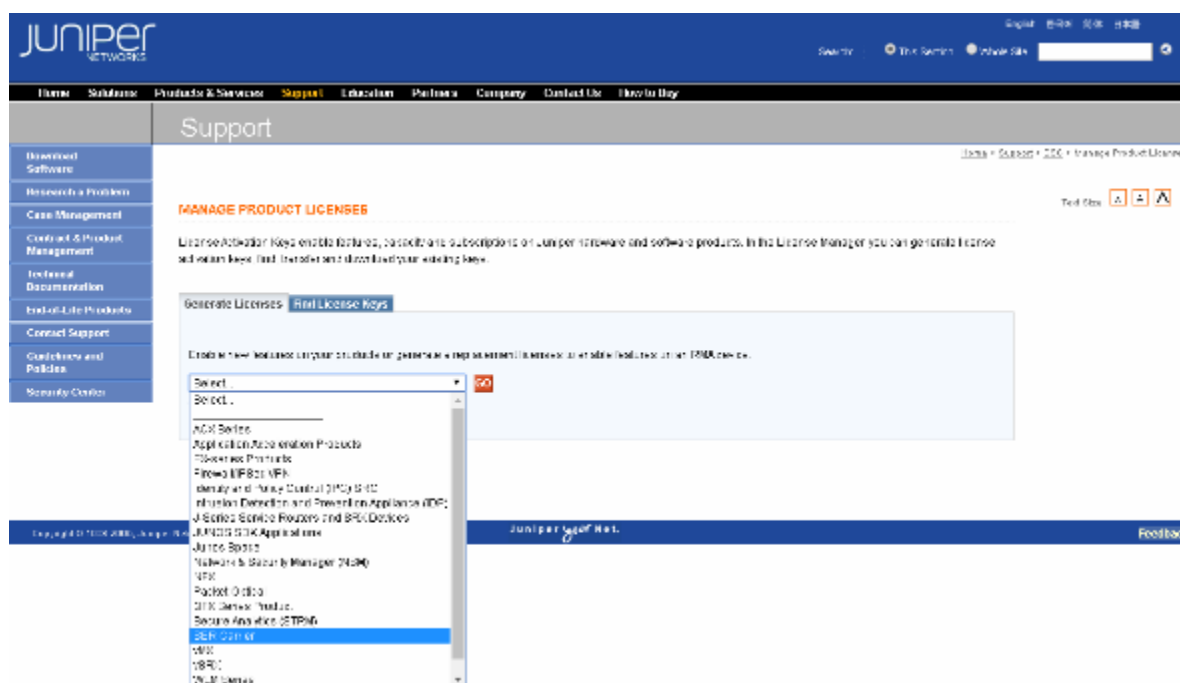
3. Enter the authorization code from your certificate and the registered E-mail address. (The E-mail address is used only for account verification at this point; you can elect not to receive the license through E-mail in the next step.)

4. When the key is generated, a success screen is displayed. You can view the license online and record the key number, download it, or have it sent to the E-mail address you entered.