Extreme SLX-OS
Software Licensing Guide, 20.7.3

Supporting ExtremeRouting and ExtremeSwitching
SLX 9740, SLX 9640, SLX 9540, SLX 9250, SLX 9150,
Extreme 8820, Extreme 8720, and Extreme 8520

9039536-00 Rev AA
December 2025



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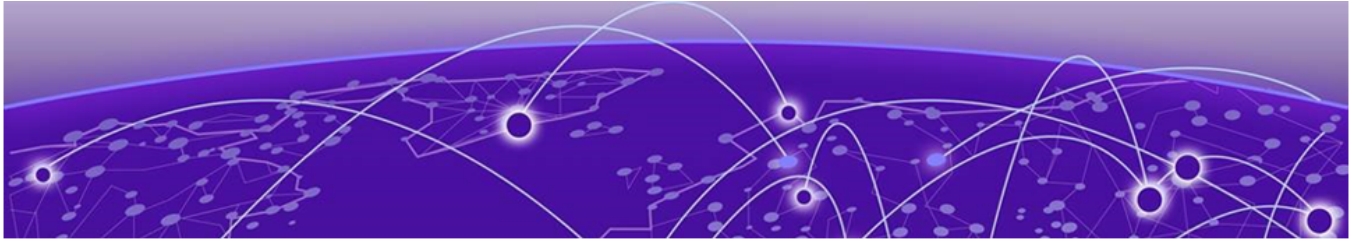


Table of Contents

Preface **4**
- Text Conventions 4
- Documentation and Training 5
  - Open Source Declarations 6
  - Training 6
- Help and Support 6
  - Subscribe to Product Announcements 7
- Send Feedback 7

About This Document **8**
- What's New in This Document 8
- Supported Hardware 8

Software Licensing Overview **10**
- Software-based licensing overview 10
  - How software-based licensing works 10
  - License types 10
- Software license terminology 11
  - Licensing rules 12
  - Licensing considerations 16
  - Software licensing configuration tasks 17

Software Licensing Tasks **25**
- Installing a license 25
- Displaying a license 26
- Adding or removing a SAU license 27
- Displaying the device license ID 28
- Removing licenses 29
- Troubleshooting licensing issues 31
- License is not properly installed 31

Dynamic Ports on Demand Licensing **33**
- Capacity on Demand and Dynamic Ports on Demand overview 33
- Managing automatic POD port assignments 34
- Mapping port assignments to a POD port set 34
- Activating the Dynamic POD feature 35
- Displaying the Dynamic POD assignments 35
- Overriding Dynamic POD assignments 36
- Reserving a port assignment 36
- Releasing a port from a POD set 37

SLX-OS Licensed Features and Part Numbers **39**
- SLX-OS Licensed Features and Part Numbers 39

Preface

Read the following topics to learn about:

- The meanings of text formats used in this document.
- Where you can find additional information and help.
- How to reach us with questions and comments.

Text Conventions

Unless otherwise noted, information in this document applies to all supported environments for the products in question. Exceptions, like command keywords associated with a specific software version, are identified in the text.

When a feature, function, or operation pertains to a specific hardware product, the product name is used. When features, functions, and operations are the same across an entire product family, such as Extreme Networks switches, the product is referred to as *the switch*.

Table 1: Notes and warnings

Icon	Notice type	Alerts you to...
	Tip	Helpful tips and notices for using the product
	Note	Useful information or instructions
	Important	Important features or instructions
	Caution	Risk of personal injury, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2: Text

Convention	Description
`screen displays`	This typeface indicates command syntax, or represents information as it is displayed on the screen.
The words *enter* and *type*	When you see the word *enter* in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says *type*.
Key names	Key names are written in boldface, for example **Ctrl** or **Esc**. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press **Ctrl**+**Alt**+**Del**
Words in italicized type	Italics emphasize a point or denote new terms at the place where they are defined in the text. Italics are also used when referring to publication titles.
NEW!	New information. In a PDF, this is searchable text.

Table 3: Command syntax

Convention	Description
bold text	Bold text indicates command names, keywords, and command options.
italic text	Italic text indicates variable content.
`[ ]`	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
`{ x | y | z }`	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
`x | y`	A vertical bar separates mutually exclusive elements.
`< >`	Nonprinting characters, such as passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*`[`*member*`...]`.
\	In command examples, the backslash indicates a “soft” line break. When a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Documentation and Training

Find Extreme Networks product information at the following locations:

Current Product Documentation
Release Notes
Hardware and Software Compatibility for Extreme Networks products
Extreme Optics Compatibility
Other Resources such as articles, white papers, and case studies

Open Source Declarations

Some software files have been licensed under certain open source licenses. Information is available on the Open Source Declaration page.

Training

Extreme Networks offers product training courses, both online and in person, as well as specialized certifications. For details, visit the Extreme Networks Training page.

Help and Support

If you require assistance, contact Extreme Networks using one of the following methods:

Extreme Portal

Search the GTAC (Global Technical Assistance Center) knowledge base; manage support cases and service contracts; download software; and obtain product licensing, training, and certifications.

The Hub

A forum for Extreme Networks customers to connect with one another, answer questions, and share ideas and feedback. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.

Call GTAC

For immediate support: (800) 998 2408 (toll-free in U.S. and Canada) or 1 (408) 579 2800. For the support phone number in your country, visit www.extremenetworks.com/support/contact.

Before contacting Extreme Networks for technical support, have the following information ready:

- Your Extreme Networks service contract number, or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any actions already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

Subscribe to Product Announcements

You can subscribe to email notifications for product and software release announcements, Field Notices, and Vulnerability Notices.

1. Go to The Hub.
2. In the list of categories, expand the **Product Announcements** list.
3. Select a product for which you would like to receive notifications.
4. Select **Subscribe**.
5. To select additional products, return to the **Product Announcements** list and repeat steps 3 and 4.

You can modify your product selections or unsubscribe at any time.

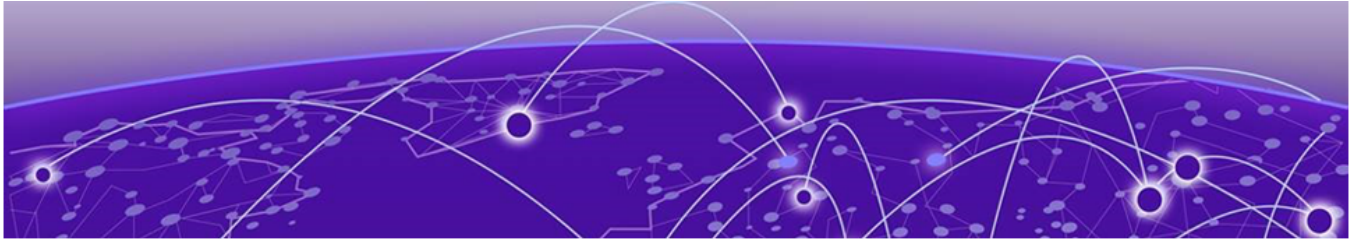
Send Feedback

The User Enablement team at Extreme Networks has made every effort to ensure that this document is accurate, complete, and easy to use. We strive to improve our documentation to help you in your work, so we want to hear from you. We welcome all feedback, but we especially want to know about:

- Content errors, or confusing or conflicting information.
- Improvements that would help you find relevant information.
- Broken links or usability issues.

To send feedback, email us at Product-Documentation@extremenetworks.com.

Provide as much detail as possible including the publication title, topic heading, and page number (if applicable), along with your comments and suggestions for improvement.



About This Document

What's New in This Document on page 8
Supported Hardware on page 8

What's New in This Document

This document is released with the SLX-OS 20.7.3 software release. No changes were made to this document for this version.

For additional information, refer to the *Extreme SLX-OS Release Notes* for this version.

Supported Hardware

SLX-OS 20.7.3 supports the following hardware platforms.

- Extreme 8820
- Extreme 8720
- Extreme 8520
- ExtremeSwitching SLX 9540
- ExtremeSwitching SLX 9250
- ExtremeSwitching SLX 9150
- ExtremeRouting SLX 9740
- ExtremeRouting SLX 9640

Note

All configurations and software features that are applicable to SLX 9150 and SLX 9250 devices are also applicable for the Extreme 8520 and Extreme 8720 devices respectively.

All configurations and software features that are applicable to SLX 9740 devices are also applicable for the Extreme 8820 devices.

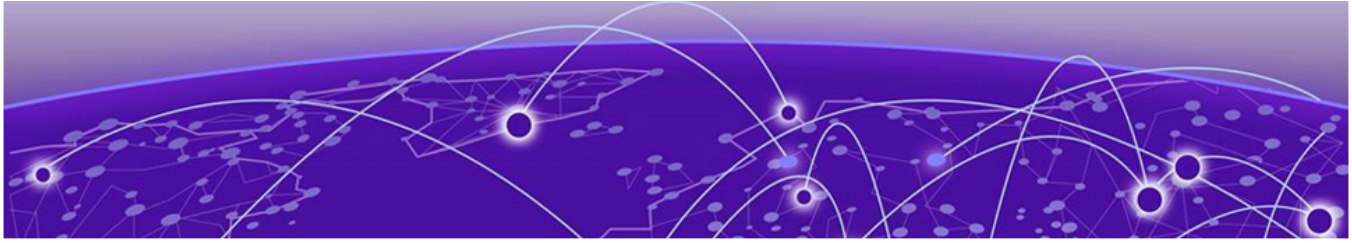
The "Measured Boot with Remote Attestation" feature is only applicable to the Extreme 8520, Extreme 8720, and Extreme 8820 devices. It is not supported on the SLX 9150 and SLX 9250 devices.



Note

Although many software and hardware configurations are tested and supported for this release, documenting all possible configurations and scenarios is beyond this document's scope.

For information about other releases, see the documentation for those releases.



Software Licensing Overview

Software-based licensing overview on page 10
Software license terminology on page 11

Software-based licensing overview

You can purchase Extreme Networks licenses per product or per feature. Each switch must have its own licenses. You can purchase licenses separately from your switch vendor.

How software-based licensing works

A permanent license (for select features on specific units) can be ordered pre-installed in a Extreme Networks device when first shipped from the factory, or later ordered and installed by the customer. In either case, additional licenses can be ordered as needed.

When a license is ordered separately (not pre-installed), a fulfillment email message, along with a *Voucher ID (VID)*, is issued to you by Extreme Networks as proof of purchase. The *VID* and license ID (*LID)* of the Extreme Networks device are used to generate a license key from the Extreme Portal. The license key is contained within a *license file* , which can be uploaded to the switch. You can add the license key to a switch using the **`license add`** command, or the **`license add FTP-URL`** *`ftpPath`* | **`SCP-URL`** *`scpPath`*] command. Once a license is installed on the SLX-OS switch, you may be prompted to disable and reenable the specific ports to activate the license. The license key is stored in the flash file system on all SLX switch devices.

License types

The following license types are supported in SLX-OS:

- Permanent licenses - A permanent license has no expiration date and is locked to a single switch or interface module identified by the switch or interface module license ID.
- Self Authenticated Upgrade (SAU) licenses - This license enables the advanced licensed feature set prior to purchasing a license. The SAU license does not require an activation process. You do not need to install a physical license on the SLX-OS platform to use the licensed feature set. You must accept the End-User License Agreement (EULA) through the CLI commands before the system can support the licensed capabilities. Once you accept the EULA, you can configure and begin using the feature on the device. The EULA requires a license to be purchased within 30

days of accepting the license EULA statement through the CLI. The fulfillment e-mail is issued through Extreme Networks once you have paid for the SAU license. The CoE document certifies that you have paid for the license to use the feature on for a specific platform.

Software license terminology

The following terms are used in this document

- License file - The file produced by the Extreme Portal when the license is generated. The file is uploaded to the device and controls access to a *licensed feature* or feature set.
- License ID (LID) - The identification number that uniquely identifies the device. The LID is used in conjunction with the VID to generate and download a software license from the Extreme Portal. The software license is tied to the LID of the device for which the license was ordered and generated.
- Licensed feature - Any hardware or software feature or set of features that require a valid software license in order to operate on the device.
- Voucher ID (VID) - This unique key, along with the *LID*, is used to generate a software license from the Extreme Portal. The Voucher ID is issued by Extreme Networks when a license is purchased. The Voucher ID is delivered through e-mail which is sent to the customer shortly after the order has completed.

Licensing rules

The following table lists the license requirements by platform, and the number of ports available through licensing.

Table 4: License requirements by platform

Platform/LC	100 GbE/40 GbE ports	100 GbE ports	10 GbE/1 GbE ports	10 GbE/100 GbE ports	License type	POD sets and sizes
Extreme 8820-40C	N/A	40 100G ports	N/A	N/A	Advanced Feature SAU License	Advanced features license can be added to the Extreme 8820-40C devices. By default, the base features and port bandwidth are available on this platform.
Extreme 8820-80C	N/A	80 100G ports	N/A	N/A	Advanced Feature SAU License	Advanced features license can be added to the Extreme 8820-80C devices. By default, the base features and port bandwidth are available on this platform.
SLX 9740-40C	N/A	40 100G ports	N/A	N/A	Advanced Feature SAU License	Advanced features license can be added to the SLX 9740-40C devices. By default, the base features and port bandwidth are available on this platform.
SLX 9740-80C	N/A	80 100G ports	N/A	N/A	Advanced Feature SAU License	Advanced features license can be added to the SLX 9740-80C devices. By default, the base features and port bandwidth are available on this platform.

Table 4: License requirements by platform (continued)

Platform/LC	100 GbE/40 GbE ports	100 GbE ports	10 GbE/1 GbE ports	10 GbE/100 GbE ports	License type	POD sets and sizes
SLX 9640-24S and SLX 9640-24S-AC-F	N/A	12 100G ports	N/A	24 10G ports	100 GbE Port Upgrade	By default, the first 4 100 GbE ports are base ports that are enabled by the OS. There is no pre-installation required for the base ports. The 100 GbE Port Upgrade license enables additional ports in increments of 4 ports.
						Two 100 GbE Port Upgrade licenses (4 ports each) add 8 ports to the SLX 9640-24S and SLX 9640-24S-AC-F switches to bring the total number of 100 GbE ports to 12.
SLX 9640-24S-12C	N/A	12 100G ports	N/A	24 10G ports	100 GbE Port Upgrade	By default, the first 4 100 GbE ports are base ports that are enabled by the OS. One 100 GbE Port Upgrade pre-installed license adds 8 100 GbE ports to the SLX 9640-24-12C and SLX 9640-24S-AC-F switches to bring the total number of 100 GbE ports to 12.
SLX 9640-24S and SLX 9640-24S-12C	N/A	N/A	N/A	N/A	Advanced Feature SAU License	Advanced features license can be added to the SLX 9640 switches.
SLX 9150-48Y (fiber)	N/A	8 100G ports	N/A	48 10G ports	Advanced Feature SAU License	Advanced features license can be added to the SLX 9150-48Y switches. By default, the base features and port bandwidth are available on this platform.

Table 4: License requirements by platform (continued)

Platform/LC	100 GbE/40 GbE ports	100 GbE ports	10 GbE/1 GbE ports	10 GbE/100 GbE ports	License type	POD sets and sizes
SLX 9150-48XT 10BASE-T (copper)	N/A	6 100G ports	48 10G ports	N/A	Advanced Feature SAU License	Advanced Feature SAU License can be added to the SLX 9150-48XT 10BASE-T switches. By default, the base features and port bandwidth are available on this platform.
SLX 9540	N/A	6	24		100 GbE Port Upgrade	Three 100 GbE POD licenses (2 ports each) add 6 ports to the SLX-9540-24S switches to bring the total number of ports to 6.
						100 GbE POD licenses (6 ports) are already pre-installed in the SLX-9540-48S switches.
					Capacity on Demand (COD) for 10GbE ports	One COD license (24 ports) brings 24 1GbE ports to 10GbE on the SLX-9540-24S switches, to bring the total number of 10GbE ports to 48.
						COD license (24 ports) is already pre-installed in the SLX-9540-48S switches.
					Advanced feature SAU License	Advanced features license can be added to the SLX-9540-24S and SLX-9540-48S switches.

The following table provides descriptive details for the license type.

Table 5: Extreme Networks licenses for SLX-OS

License	Description	Notes
100 GbE Port Upgrade (SLX 9640-24S and SLX 9640-24S-AC-F)	For the SLX 9640, this license adds 4 100 GbE ports when additional licenses are purchased in increments of 4 ports each. The base port size is 4 100 GbE ports. You can purchase up to 2 licenses (4 ports each) for a total 12 100 GbE licensed ports. The first license enables ports 29 - 32. The second license enables ports 33 - 36. All 24 10 GbE are base ports. You do not need a license to enable the 10 GbE ports.	When the 100 GbE Port Upgrade license is added, ports that are disabled or shutdown can be re-enabled using the **`no shutdown`** command. Ports must be set to the shutdown state using the **`shutdown`** command prior to removing a license(s). A trial license is not supported. Dynamic Ports on Demand (DPOD) licensing and the Capacity on Demand (COD) license are not supported on the SLX 9640 platform. The SKU is EN-SLX-9640-4C-POD-P (Feature 100G Port Upgrade).
Pre-installed 100 GbE Port Upgrade (SLX 9640-24S-12C	For the SLX 9640, the license is pre-installed and enables 8 100 ports. The pre-installed license enables ports 29 - 36. The base port size is 4 100 GbE ports. By default, ports 1 -28 are enabled by the OS. The total number of 100 GbE ports is 12.	A trial license is not supported. Dynamic Ports on Demand (DPOD) licensing and the Capacity on Demand (COD) license are not supported on the SLX 9640 platform.
Advanced License (SLX 9740)	The Advanced Feature SAU license enables the advanced licensed features prior to purchasing a license. On the SLX 9740 platform, the Advanced Feature license set supports functionality for MPLS, BGP-EVPN and Integrated Application Hosting.	The SKU is: SLX9740-ADV-LIC-P. (Features: Advanced Features)
Advanced License (SLX 9640)	The Advanced feature SAU license enables the advanced licensed features prior to purchasing a license. On the SLX 9640 platform, the Advanced Feature license set includes the following features: BGP EPVN, 3rd Party VM, MPLS.	The SKU is: EN-SLX-9640-ADV-LIC-P (Features: Advanced Features).
100 GbE Port Upgrade (SLX 9540)	For the SLX 9540, this license adds 6 GbE ports for a total of 6 100 GbE licensed ports. The base port size is 0 ports.	
Capacity on Demand (COD) (SLX 9540)	The COD license adds 24 10 GbE ports for a total of 48 10 GbE licensed ports. The base port capacity includes 24 10 GbE ports without an additional license. All of the 48 1 GbE/10 GbE ports can be used at 1 GbE speed without a license.	

Table 5: Extreme Networks licenses for SLX-OS (continued)

License	Description	Notes
Advanced License (SLX 9540)	The Advanced Feature SAU license enables the advanced licensed features prior to purchasing a license. On the SLX 9540 platform, the Advanced Feature license set includes BGP EPVN, 3rd Party VM, MPLS, and OptiScale for Internet Routing. The Base Features set includes L2 Protocols including L2 MCT, L3 Protocols (Static + Dynamic), Standard interfaces SNMP, Netconf, REST, and Python scripting.	To enable MPLS features on the SLX 9540 the Advanced feature SAU license is required.
Advanced License (SLX 9150)	The Advanced Feature SAU license enables the advanced licensed features prior to purchasing a license. On the SLX 9150 platform, the Advanced Feature license set supports functionality for BGP EVPN and TPVM (3rd Party VM).	
Advanced License (SLX 9250)	The Advanced Feature SAU license enables the advanced licensed features prior to purchasing a license. On the SLX 9250 platform, the Advanced Feature license set supports functionality for BGP EVPN and TPVM (3rd Party VM).	
Advanced License (Extreme 8820)	The Advanced Feature SAU license enables the advanced licensed features prior to purchasing a license. On the Extreme 8820 platform, the Advanced Feature license set supports functionality for MPLS, BGP-EVPN and Integrated Application Hosting.	The SKU is: 8000-PRMR-LIC-P. (Features: Advanced Features)

Licensing considerations

This section lists the generic rules, restrictions, and considerations related to the software licensing:

- A license is tied to the unique LID of the blade or the switch for which the license was generated. Therefore, a license can be used on one switch only. It cannot be used on any other switch or blade.
- More than one license for multiple features can be installed per switch or blade.
- Only one permanent license at a time can be in effect for a licensed feature.
- Licenses are not interchangeable between units.
- Licenses are independent of configuration files and are therefore not affected when you make changes to a configuration file or restore the default configuration, or if the running configuration is overwritten with the default configuration.

Software licensing configuration tasks

This section describes the configuration tasks for generating and obtaining a software license, and then installing it on the device. Perform the tasks in the order as given in the following list.

Following are the configuration tasks for software licensing:

1. Order the desired license.
2. After ordering the license, you will receive a fulfillment email containing the Voucher ID.
3. Retrieve the LID of the device by entering the **show license id** command on the device. You must use the Line Card LID to obtain licenses for the Line Cards.
4. Log in to the Extreme Portal located here: https://extremeportal.force.com/ExtrLicenseLanding. If you do not have an account yet, log in to https://secure.extremenetworks.com.
5. Upload the license file to the device.
6. Verify that the license is installed.

Note
Do not discard the fulfillment email with the VID in case it is needed for technical support or product replacement (RMAs).

Generating a license

The following procedure demonstrates how to generate and obtain a software license.

1. Log in to the Extreme Networks Portal at https://extremeportal.force.com/ExtrLicenseLanding.

2. If you do not have an Extreme portal account, select **Create a new Extreme Portal account.**

   The following figure shows the Extreme Portal login window.

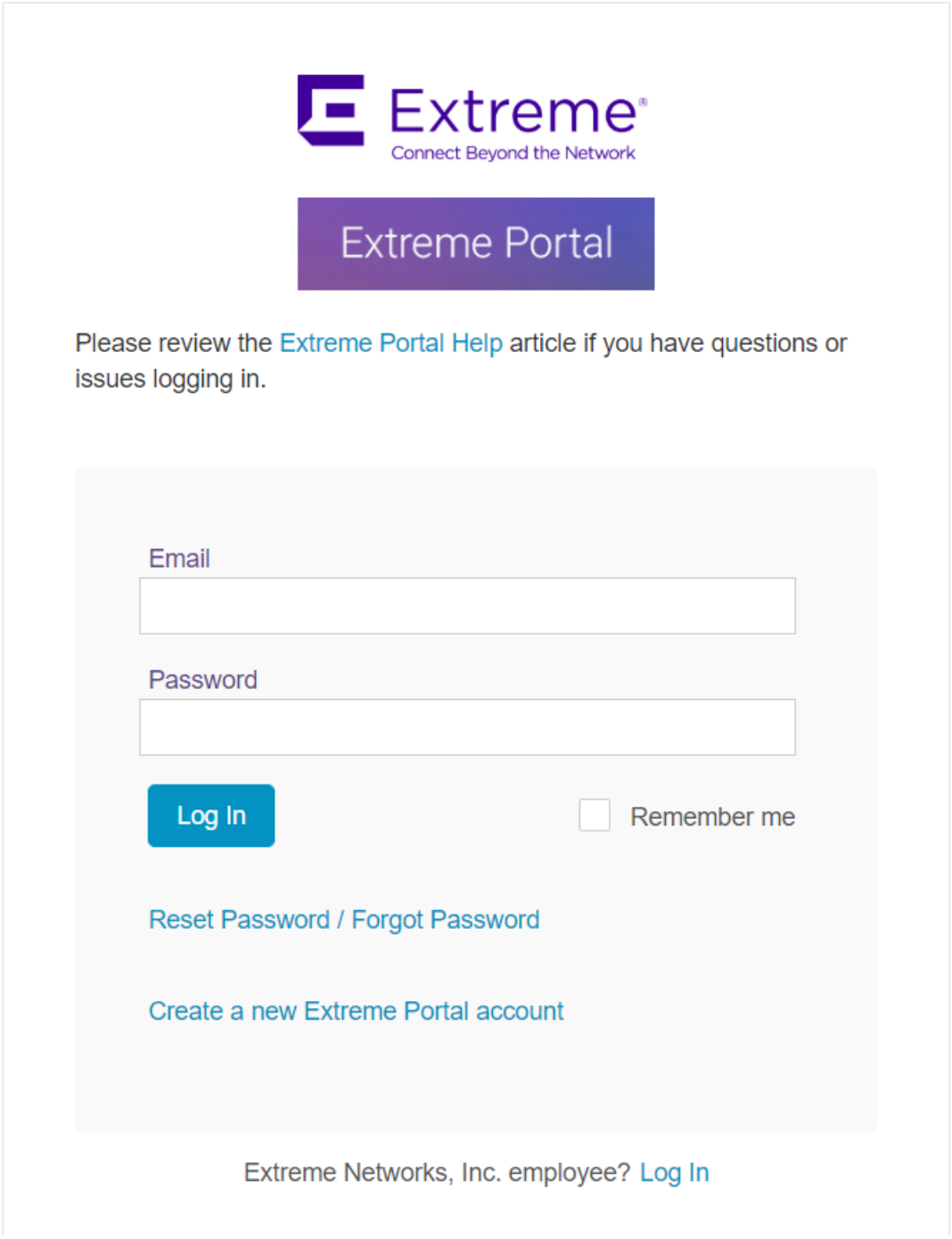


Figure 1: Extreme portal login window

3. Enter your email and password. Click **Log In**.
   The **Licenses Home** window appears.

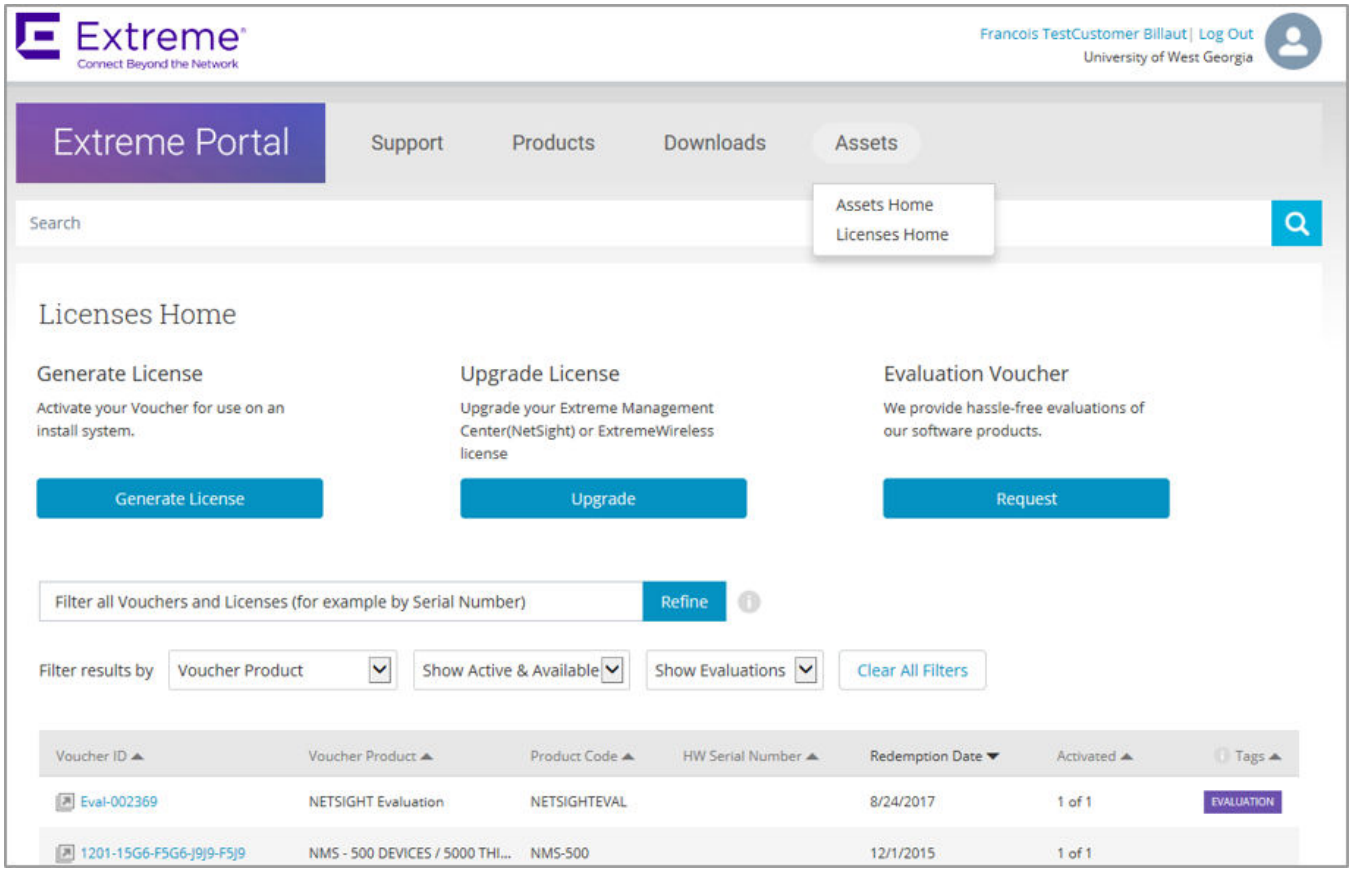


Figure 2: Licenses Home window

4. Select **Assets** > **Licenses Home** option. Click **Generate License**.
   The **Generate License** window is displayed.

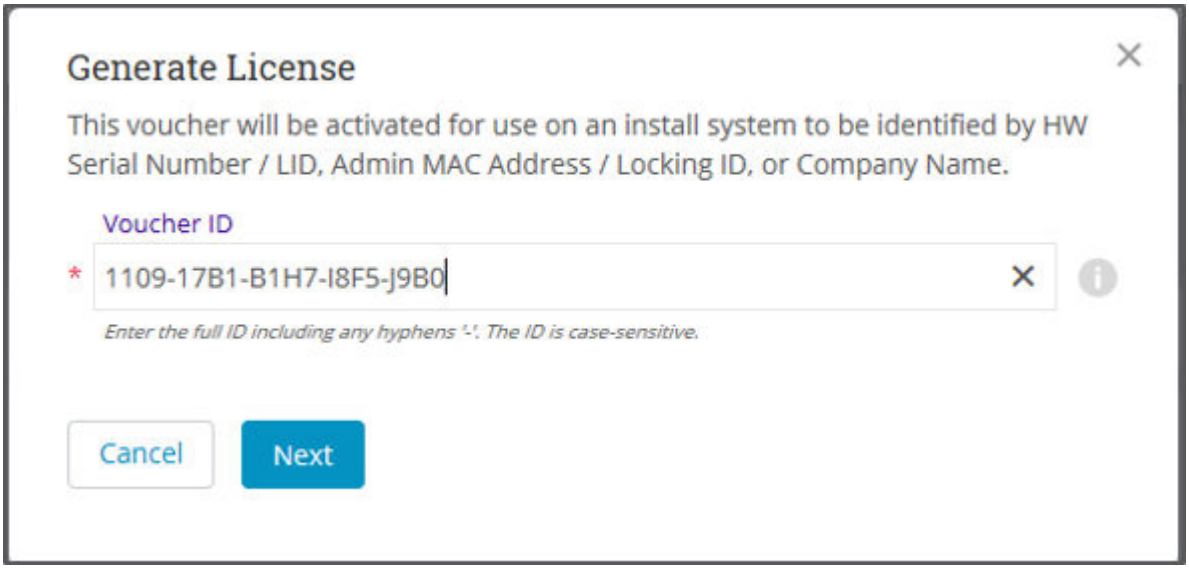


Figure 3: Generate License window

5. Enter the VID. Click **Next.**
   The VID has 20 alphanumeric characters with hyphens.

6. Enter the unique identifier of the HW (or the serial number of the LID). Click **Submit**.

Note
You must check the box to agree to the Terms and Conditions.

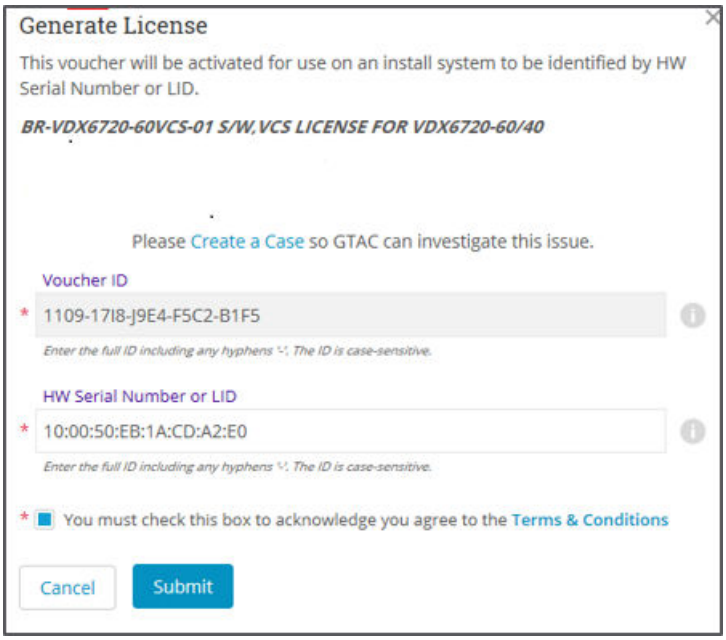


Figure 4: HW serial number window

7. The VID is displayed. The example below displays voucher information for a non-capacity license.

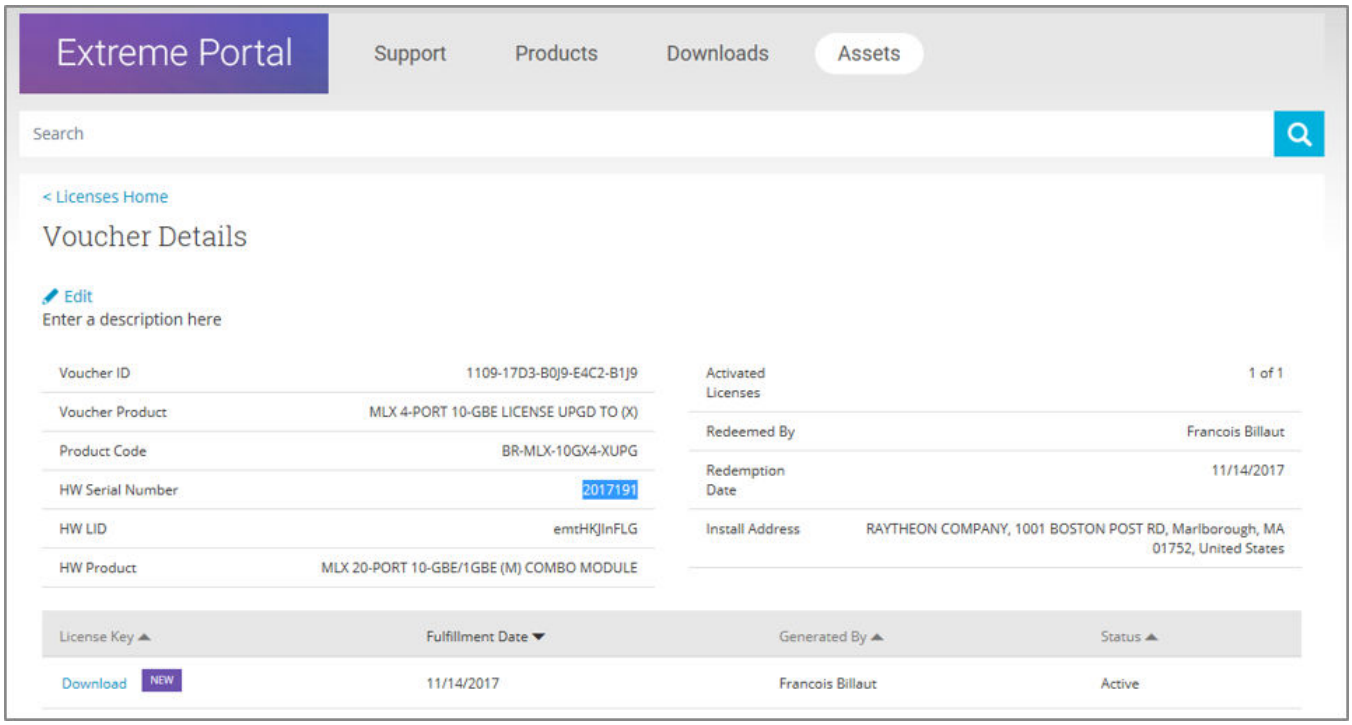


Figure 5: Voucher Details window

8. Click **Download** to download a copy of the license.

   A license can be downloaded after license generation or when a unit is queried. The license is not emailed.

   In example below, the contents of the XML license are displayed, including the license SKU and license keys.

Figure 6: License file window

```
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
- <lic:licenseInfo xmlns:lic="http://license.extreme.com/licensefile">
  - <licenseHeader>
      <productNumber>PORT_100G_40G_UPGRADE</productNumber>
      <description>PORT_100G_40G_UPGRADE</description>
      <version>1.0</version>
      <dateGenerated>20180124223350367</dateGenerated>
    </licenseHeader>
  - <license>
      <featureName>PORT_100G_40G_UPGRADE</featureName>
      <featureVersion>11.x</featureVersion>
      <licKey>*B 4yKB8,0gwrCcKkm3FdDWV1lJwTQ8SOUyPDyZa5Y24LV59PE6kAErj:I1oVSBf0R9fe8PZlBrwklGNFj081TQkHVokB7:ZftIAYudRbLppBRuLGviJO5St6Cc7IES55,G9gVz#</licKey>
    </license>
</lic:licenseInfo>
```

Querying a license

1. To query a license, select **Assets** > **Licenses Home** option.

2. Enter the SN or LID of the HW asset, or the VID of the SW asset in the **Refine** window box.

   The example below displays how to query a license for a VID.

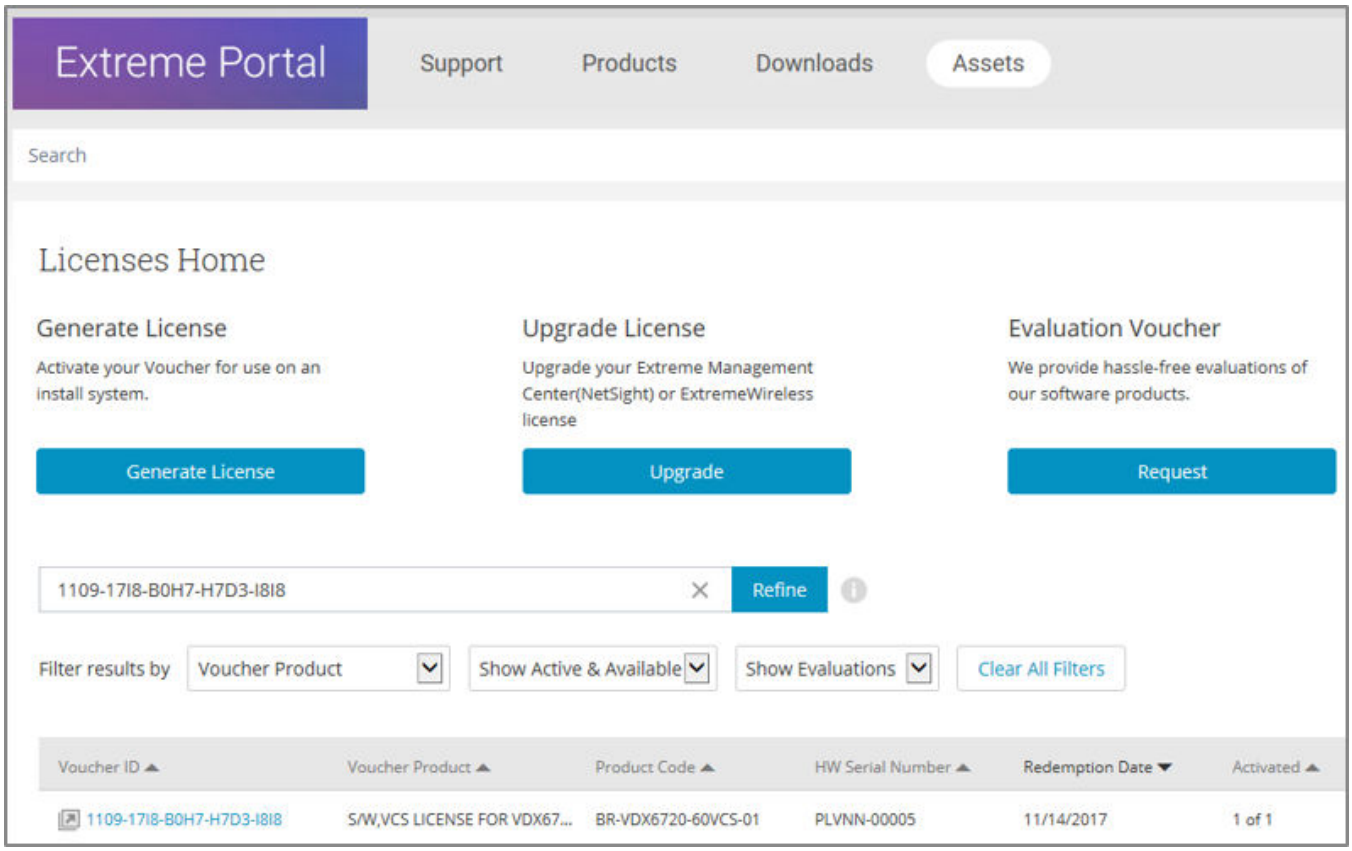


Figure 7: Querying a license window

3. Click the **Voucher** (under the Voucher ID column). The VID is displayed.
   The example below displays voucher information for a non-capacity license.

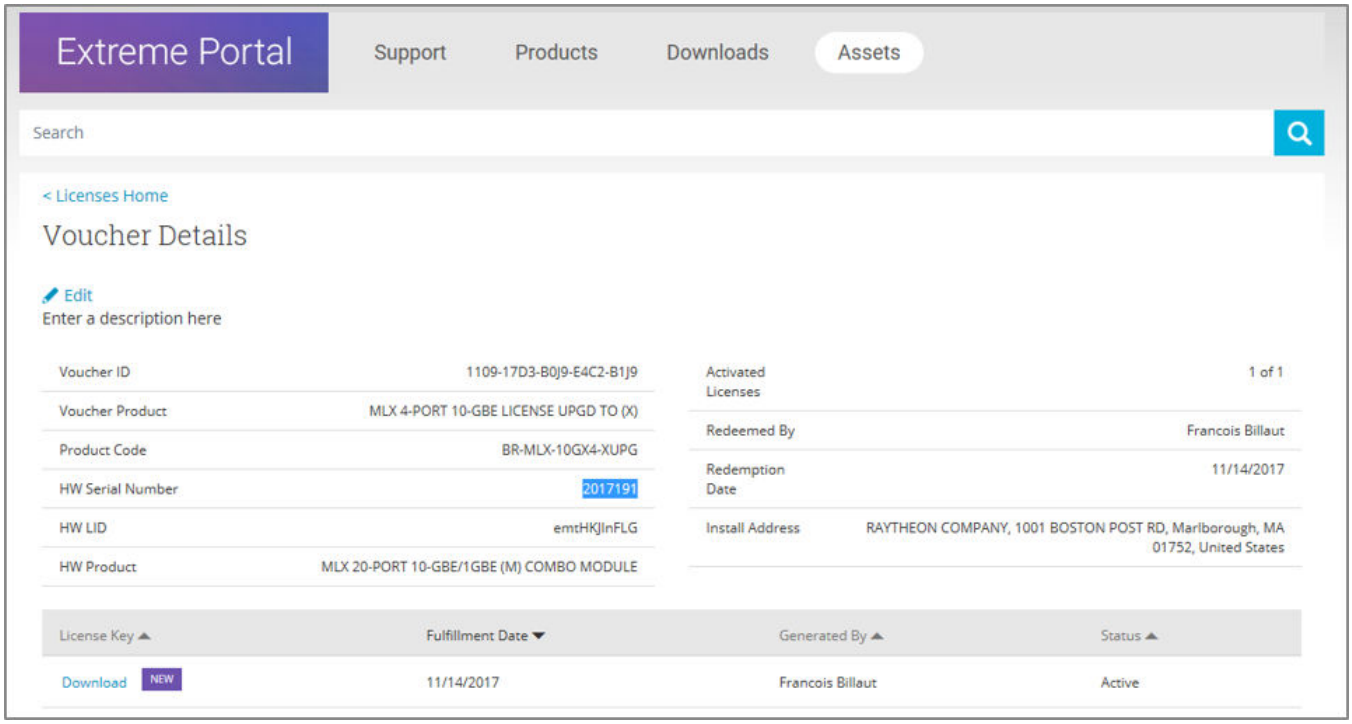
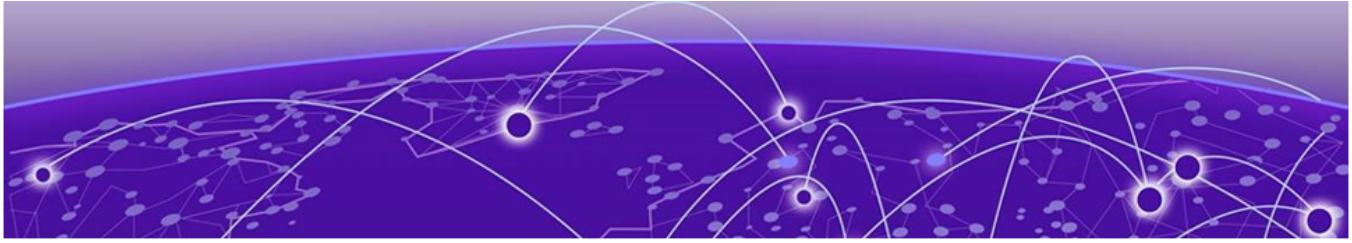


Figure 8: Voucher details window



Software Licensing Tasks

Installing a license on page 25
Displaying a license on page 26
Adding or removing a SAU license on page 27
Displaying the device license ID on page 28
Removing licenses on page 29
Troubleshooting licensing issues on page 31
License is not properly installed on page 31

Installing a license

Use the following procedures to install licenses on a SLX-OS device.

1. Install the license on the device using one of the following commands:
   - Enter the **license add** [**FTP-URL** *ftpPath* | **SCP-URL** *scpPath*] command. This command adds licenses from an XML-tagged license file.

     ```
     device# license add SCP-URL scp://fvt:mypassword@10.70.5.58//users/
     home40/"pray4green/
     20141113164801170PORT_UPGRADE.xml
     License Added [*B
     OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjpHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9ylO:cf0
     0If68JA1flHZz
     MQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#]
     For license change to take effect, it may be necessary to enable the ports...
     ```

   - Enter the **license add licstr** command followed by the license key. The license key is printed between the XML start <licKey> and end </licKey> tags in the license file. Be sure to copy the entire string, including spaces and non-alphanumeric characters. If the license key includes spaces, you must enclose the entire string in double quotation marks. Repeat this command for each software license key found in the license file.

     ```
     device# license add SCP-URL scp://fvt:mypassword@10.70.5.58//users/
     home40/"pray4green/
     20141113164801170PORT_UPGRADE.xml
     License Added [*B
     OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjpHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9ylO:cf0
     0If68JA1flHZz
     MQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#]
     For license change to take effect, it may be necessary to enable the ports...
     ```

2. Verify that you added the license by entering the **show license** command. The command lists all licensed features currently installed on the device. If the feature is not listed, enter the **license add licstr** command again.

   Depending on the license type, you may be prompted to reload the device or to disable and re-enable the chassis or specific ports. The following table indicates the minimal steps you may need to take to make the installed features fully functional after the license add operation is complete. Take the appropriate action as indicated by the command output.

Table 6: Requirements for activating a license after installation

License	Description
PORT_100G_40G_UPGRADE	For all applicable platforms, may require enabling the added ports or disabling and then re-enabling the added ports.
PORT_10G_UPGRADE	For all applicable platforms, may require enabling the added ports or disabling and then re-enabling the added ports.
PORT_100G_UPGRADE	For all applicable platforms, may require enabling the added ports or disabling and then re-enabling the added ports.
CAPACITY_ON_DEMAND	For all applicable platforms, requires explicitly manually reserving ports using **config license dpod** CLI command and then may require enabling the added ports or disabling and then re-enabling the added ports.
ADVANCED_FEATURES	The End-User License Agreement (EULA) must be accepted through the **license eula** CLI commands before the system can support the licensed capabilities for the SAU license.

Displaying a license

You can display installed licenses using the **show license** command.

The following example displays the 100G Port Upgrade license and the Advanced features license.

```
device# show license
Chassis:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Capacity on Demand license
       Feature name:CAPACITY_ON_DEMAND
       Capacity: 24
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       100G Port Upgrade license
       Feature name:PORT_100G_UPGRADE
       Capacity: 6
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Advanced Features license
       Feature name:ADVANCED_FEATURES
       License is Trust Based
```

```
       EULA acceptance date: Thu May 30 09:55:54 2019
```

The following example displays the 100 GbE port upgrade license when 4 100 GbE ports are installed on the SLX 9640 device.

```
device# show license
Chassis:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

    100G Port Upgrade license
    Feature name:PORT_100G_UPGRADE
    Capacity: 4
    License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

When there are no licenses installed on the chassis, the **show license** command output displays the following:

```
device# show license
No entries available
```

Adding or removing a SAU license

You can add a SAU license using the **license eula accept** command. The EULA text can be displayed using the **show license eula** command.

The following example displays the EULA text.

```
device# show license eula
Use of the features enabled via the "license eula accept" CLI requires a license to
be purchased within 30 days. By accepting the EULA you indicate that you
have read and accept the Extreme End User License Agreement found at the following URL.
[https://learn.extremenetworks.com/rs/641-VMV-602/images/Extreme-Networks-End-User-
License-Agreement.pdf].
```

When the **license eula accept** command is entered, you are agreeing to purchase a license within a specific timeframe. You can begin using the features immediately.

The following example shows how to accept the EULA for the SAU license (Advanced Features).

```
device# license eula accept ADVANCED_FEATURES
2016/11/24-23:58:11, [SEC-1120], 41,, INFO, SLX9540, License EULA entry added for
ADVANCED_FEATURES feature (capacity 0).

EULA accepted for feature [ADVANCED_FEATURES]

Use of the ADVANCED_FEATURES feature requires a license to be purchased within 30 days.
By accepting the EULA you indicate that you have read and accept the Extreme End USER
License Agreement found at the following URL
[https://learn.extremenetworks.com/rs/641-VMV-602/images/Extreme-Networks-End-User-
License-Agreement.pdf].
You can decline the EULA acceptance now by entering "license
```

```
eula decline ADVANCED_FEATURES"
at the CLI prompt; declining the EULA will prevent use of the licensed feature.
```

The **show license** command will also display the SAU license when the EULA is accepted.

```
device# show license
Chassis:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
        Advanced Features license
        Feature name:ADVANCED_FEATURES
        License is Trust Based
        EULA acceptance date: Thu Nov 24 23:58:11 2016
```

If the SAU license is not accepted using the **license eula accept** command, the Advanced features cannot be used. In the following example for the Guest OS for TPVM feature, the **license eula accept** command was not accepted prior to the configuration. You must accept the SAU license before you can begin using the Advanced features.

```
deviceSLX# tpvm install
ERROR: ADVANCED_FEATURES license is missing. Please install ADVANCED_FEATURES license for
TPVM operation.
device#
```

You can remove a SAU license using the **license eula decline** command. The following example displays removing a SAU license (Advanced features).

```
device# license eula decline ADVANCED_FEATURES

 EULA removed for feature [ADVANCED_FEATURES]
```

When the **license eula decline** command is entered, you are no longer able to use the licensed features. Before you can "decline" the licensed features, all configuration settings related to the feature must be restored to default settings.

The following CLI message is displayed when you attempt to configure a feature that requires a SAU license, and you have not accepted the EULA and there is no SAU license installed for that feature.

```
device(config)# router mpls
%Error: Advanced Features License not found.
```

Displaying the device license ID

The switch license ID identifies the switch for which the license is valid. You will need the switch license ID when you activate a license key.

To display the switch license ID, enter the **show license id** command in privileged EXEC mode.

```
device# show license id
Location                License ID
```

```
==================================================
Chassis                 10:00:D8:84:66:F0:16:FE
```

Removing licenses

Depending on the license type, you may be prompted to clear license-dependent configurations, reload the switch, or disable and re-enable the chassis or specific ports. The following table indicates the minimal steps you may need to take to remove specific licenses. Take the appropriate action as indicated by the command output.

Table 7: Requirements for deactivating a license after removal

License	Description
ADVANCED_FEATURES	All features that have been enabled that depend on the Advanced Features license (MPLS, BGP EVPN, Guest OS for TPVM, etc.) must be disabled first.
CAPACITY_ON_DEMAND	Port reservations for non-Base ports provisioned by the license must be released first.
PORT_100G_UPGRADE	Port reservations for non-Base ports provisioned by the license must be released first.
PORT_10G_UPGRADE	Port reservations for non-Base ports provisioned by the license must be released first.
PORT_100G_40G_UPGRADE	Port reservations for non-Base ports provisioned by the license must be released first.

For some licensed features, you must clear all configurations related to the feature before you can remove the license for that feature. Some features may require you to disable and re-enable selected ports or the entire switch.

Refer to the console output for other specific requirements.

Do the following to remove an installed (non SAU) license.

1. Enter the **`show license`** command to display the active licenses.
2. Issue the **`license remove`** command followed by the license key or the feature name.

   The license key is case-sensitive and must be entered exactly as shown. If the license key includes spaces, you must enclose the entire string in double quotation marks.
3. Take the appropriate action as indicated by the command output.

   Depending on the license type, you may be prompted to clear license-related features, to reboot the switch, or to disable and re-enable the chassis or specific ports.

4. Enter the **show license** command to verify that the license is removed. If there are no license keys, the command output displays "No entries available."



Note
To remove the license, use the **license remove** command with the *licenseString* operand or use the feature name, followed by the slot number. You cannot display the license key with the **show license** command.

The following example illustrates the display and removal of an 100G port upgrade license by its feature name.

```
device# show license
Chassis:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Capacity on Demand license
       Feature name:CAPACITY_ON_DEMAND
       Capacity: 24
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       100G Port Upgrade license
       Feature name:PORT_100G_UPGRADE
       Capacity: 6
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Advanced Features license
       Feature name:ADVANCED_FEATURES
       License is Trust Based
       EULA acceptance date: Thu May 30 09:55:54 2019


device# license remove licStr "*B
Cgo7qybrCfwG0Ta7DtU6frX4Qoy,DTUdLsoAshgXF03J0iYvWwSSe56HcUNs7V7z3bhvFHuOw7FfY1MAJrxImKL
Tcdp:tjB:P,QU1AzBx1i8fWfM6eJqhPfXkVaufGi:8,fm#"
2019/08/21-07:26:33, [SEC-3051], 3230,, INFO, SLX9540, The license key *B
Cgo7qybrCfwG0Ta7DtU6frX4Qoy,DTUdLsoAshgXF03J0iYvWwSSe56HcUNs7V7z3bhvFHuOw7FfY1MAJrxImKL
Tcdp:tjB:P,QU1AzBx1i8fWfM6eJqhPfXkVaufGi:8,fm# is Removed.

License Removed [*B
Cgo7qybrCfwG0Ta7DtU6frX4Qoy,DTUdLsoAshgXF03J0iYvWwSSe56HcUNs7V7z3bhvFHuOw7FfY1MAJrxImKL
Tcdp:tjB:P,QU1AzBx1i8fWfM6eJqhPfXkVaufGi:8,fm#]

For license to take effect, it may be necessary to disable/enable ports or switch...
```

The remaining licenses are displayed as shown in the following example.

```
device# show license
Chassis:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Capacity on Demand license
       Feature name:CAPACITY_ON_DEMAND
       Capacity: 24
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Advanced Features license
       Feature name:ADVANCED_FEATURES
       License is Trust Based
       EULA acceptance date: Thu May 30 09:55:54 2019
```

The following example displays removing a SAU license (Advanced features).

```
device# license eula decline ADVANCED_FEATURES

EULA removed for feature [ADVANCED_FEATURES]
```

Troubleshooting licensing issues

Some features require licenses in order to work properly. Non-SAU licenses are created using a switch or Line Card license identifier (LID), so you cannot apply one license to different switches. Before calling your switch support provider, verify that you have the correct licenses installed by using the **show license** command.

License is not properly installed

If a licensed feature is not functioning, a probable reason is that the license for that feature has not been installed correctly. Either the license was not installed, or it was installed and a required system reboot or other required action was not performed.

If you suspect a license is not properly installed, complete the following steps.

1. In privileged EXEC mode, enter the **show license** command to display the currently installed licenses.

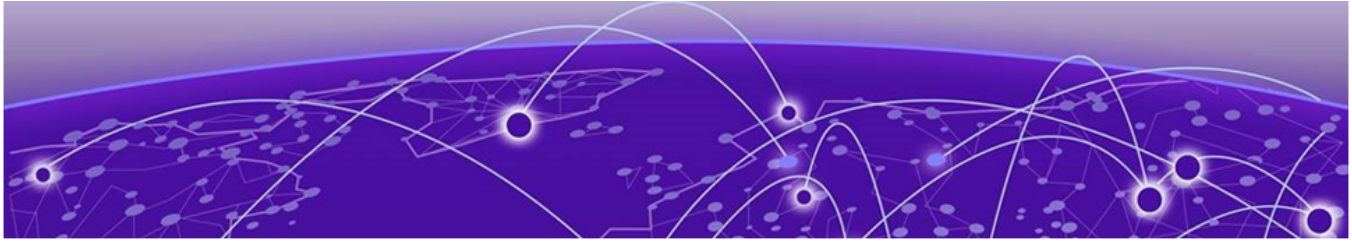
```
device# show license
Chassis:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Capacity on Demand license
       Feature name:CAPACITY_ON_DEMAND
       Capacity: 24
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       100G Port Upgrade license
       Feature name:PORT_100G_UPGRADE
       Capacity: 6
       License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
       Advanced Features license
       Feature name:ADVANCED_FEATURES
       License is Trust Based
       EULA acceptance date: Thu May 30 09:55:54 2019
```

2. If the Port Upgrade license appears in the **show license** command output, but the feature does not work for the expected ports, the probable cause is that the affected ports were not re-enabled after installing the license or that the Port Upgrade capacity is insufficient for the number of ports that are being used.

Note
After adding a Port Upgrade license, you must disable and re-enable all affected ports.

3. If the license does not appear in the **show license** command output, then it was not installed. In privileged EXEC mode, enter the **license add lictstr** command to install the license. For Port Upgrade licenses, you must also disable and enable the switch or port.

```
device# license add licstr "*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjpHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9ylO:cf00If
68JA1flHZzMQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#"
2014/11/13-16:41:16, [SEC-3051], 5615, SW/0 | Active, INFO, MYSWITCH, The license key
*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjpHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9ylO:cf00If
68JA1flHZzMQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#
License Added [*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjpHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9ylO:cf00If
68JA1flHZzMQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#]
For license change to take effect, it may be necessary to enable ports...
```



Dynamic Ports on Demand Licensing

Capacity on Demand and Dynamic Ports on Demand overview on page 33
Managing automatic POD port assignments on page 34
Mapping port assignments to a POD port set on page 34
Activating the Dynamic POD feature on page 35
Displaying the Dynamic POD assignments on page 35
Overriding Dynamic POD assignments on page 36
Reserving a port assignment on page 36
Releasing a port from a POD set on page 37

Capacity on Demand and Dynamic Ports on Demand overview

Capacity on Demand (COD) and Dynamic Ports on Demand (POD) provides a flexible mechanism for allocating port licenses that you can purchase to extend the base functionality of the SLX 9540 switches. The additional ports can be enabled after you install the appropriate license keys. The Dynamic POD feature assigns port licenses based on your connectivity choices. Any port on the switch can claim a free assignment from the pool of available POD licenses. The COD licenses require explicit manual port assignment for non-base allowance ports before the port can be used at 10 GbE port speed.

Note
When adding a Dynamic POD license to a platform that does not support Dynamic POD, you will be allowed to add the license, but the license display will show that the Dynamic POD license is not supported on the platform.

In a Dynamic POD system, each port can be associated with one of two port sets:

- Base port set — Ports that can be enabled without any Port Upgrade license.
- Port Upgrade license port set — Ports that are assigned after all the Base port set have been used or assigned; these are associated with the existence of a Port Upgrade or Capacity on Demand license.

Note
The 100 GbE/40 GbE, 10 GbE, and 100 GbE Port Upgrade licenses are supported using a base port set plus the ports that are available as specified by the port capacity in the respective port upgrade. These licenses are supported only on the SLX 9540 switches.

Note
Licenses are based on the license ID and are not interchangeable between units.

Managing automatic POD port assignments

The Dynamic POD feature is only used on the 100 GbE ports of the SLX 9540 platform . With the Dynamic POD feature, you can use the base port set plus the number of additional ports you purchased. All ports that do not receive a POD assignment and are trying to come online will go offline. The **show ip interface brief** and **show interface ethernet** *slot/port* commands display the reason for the port-disabled status as related to POD licensing.

The Dynamic POD mechanism detects the ports that have active links, and makes assignments based on the remaining pool of vacancies:

- If the count of assigned ports is below the number of ports in the combined Base allowance plus the capacity provided by the purchased POD set, additional dynamic assignments can be made at a later time as new links are established. If a port comes online, that port can get assigned if you still have vacancies in your POD set.
- If the number of detected active links is greater than the Base allowance plus the number of ports in the purchased POD set, port assignments are made in the order in which the ports come online until the purchased limit is reached. Because the time it takes for each port to come online varies, the order in which ports are assigned to a given POD set cannot be guaranteed.

If the given assignment order does not align with your intended use of the ports, you can make adjustments using the **dpod** *slot/port* **reserve** or the **dpod** *slot/port* **release** configuration commands. Refer to Overriding Dynamic POD assignments on page 36 for more information.

Mapping port assignments to a POD port set

For all platforms that support DPOD, ports are associated with the Port Upgrade license in the order in which they come online and automatically receive a license assignment from the pool of unassigned ports in the POD set. The first ports that receive a POD assignment are associated with the base port set. When all ports in the base port set are assigned, the next ports that come online receive assignments from the Port Upgrade license port set.

The association of a specific port to a POD set matters only when you want to remove a Port Upgrade license from the system. Sufficient assigned ports must be released from the DPOD Port Upgrade or COD reservations before the license can be removed. Refer to Releasing a port from a POD set on page 37 for more information.

Activating the Dynamic POD feature

Use the following procedure to activate the Dynamic POD feature.

1. Verify the current states of the ports with the **show ip interface brief** command.

   The command output indicates whether a port is licensed.
2. Install the Port Upgrade license.
3. Use the **shutdown** and **no shutdown** commands to disable and re-enable the ports.
4. Use the **show ip interface brief** command to verify the newly activated ports.
5. Use the **show interface ethernet** *slot/port* command to display port details.

   The following example shows a device without any Port Upgrade license installed on an interface module. The 12 ports in the base port set are online and assigned. The remaining 2 ports are unassigned and down.

```
device# show ip interface brief
Flags:  I - Insight Enabled     U - Unnumbered interface
Interface              IP-Address         Vrf                   Status                Protocol
==================     ==========         ==========          ==================      ==========
Ethernet 0/1           unassigned       default-vrf             up
up
Ethernet 0/2           unassigned       default-vrf             up
up
Ethernet 0/3           unassigned       default-vrf             up
up
Ethernet 0/4           unassigned       default-vrf             up
up
Ethernet 0/5           unassigned       default-vrf             up
up
Ethernet 0/49          unassigned       default-vrf            administratively down    down(No
100G/40G Port Upgrade License)
Ethernet 0/50          unassigned       default-vrf            administratively down    down(No
100G/40G Port Upgrade License)
```

The following example displays details for a single port that is offline because it does not have a Port Upgrade license.

```
device# show interface ethernet 0/49
  Ethernet 0/49 is down, line protocol is down (No 100G/40G Port Upgrade License)
  Hardware is Ethernet, address is 0005.1eb6.0a25
  Current address is 0005.1eb6.0a25
  Tracking status: Disabled
  Tracked interfaces: None
  Pluggable media present, Media type is sfp
  Interface index (ifindex) is 1744896001
  MTU 2500 bytes
  LineSpeed: Auto - 10000 Mbit, Duplex: Full
  Flowcontrol rx: on, tx: on
```

Displaying the Dynamic POD assignments

To display the Dynamic POD assignments, enter the **show dpod** command.

The **show dpod** command provides a summary of POD license status and POD license assignments.

In the following example from the SLX 9540, all 48 10 GbE ports and 6 100 GbE ports are licensed and potentially available.

```
device# show dpod
48 10G ports are available in this switch
6 100G ports are available in this switch
COD license is installed
100G Port Upgrade license is installed
Dynamic POD method is in use

48 10G port assignments are provisioned for use in this switch:
24 10G port assignments are provisioned by the base switch allowance
24 10G port assignments are provisioned by the COD license
2 10G ports are assigned to the base switch allowance or installed licenses:
2 10G ports are assigned to the base switch allowance
0 10G ports are assigned to the COD license
10G ports assigned to the base switch allowance:
0/7, 0/9
10G ports assigned to the COD license:
None
10G ports that are not assigned:
0/1, 0/2, 0/3, 0/4, 0/5, 0/6, 0/8, 0/10, 0/11, 0/12
0/13, 0/14, 0/15, 0/16, 0/17, 0/18, 0/19, 0/20, 0/21, 0/22
0/23, 0/24, 0/25, 0/26, 0/27, 0/28, 0/29, 0/30, 0/31, 0/32
0/33, 0/34, 0/35, 0/36, 0/37, 0/38, 0/39, 0/40, 0/41, 0/42
0/43, 0/44, 0/45, 0/46, 0/47, 0/48
46 10G license reservations are still available for use by unassigned ports

6 100G port assignments are provisioned for use in this switch:
0 100G port assignments are provisioned by the base switch allowance
6 100G port assignments are provisioned by the 100G Port Upgrade license
3 100G ports are assigned to the base switch allowance or installed licenses:
0 100G ports are assigned to the base switch allowance
3 100G ports are assigned to the 100G Port Upgrade license
100G ports assigned to the base switch allowance:
None
100G ports assigned to the 100G Port Upgrade license:
0/49, 0/50, 0/53
100G ports that are not assigned:
0/51, 0/52, 0/54
3 100G license reservations are still available for use by unassigned ports
```

Overriding Dynamic POD assignments

You can override the automatic port license assignments by releasing Dynamic POD assignments from a port and by reserving an assignment for a specific port.

Reserving a port assignment

Reserving an assignment for a port assigns that port to a POD or COD license regardless of whether the port is online or offline. Reserving assignments allocates the POD license to specified ports. This operation overrides automatic port assignments.

The reserved assignment will not be available to other ports that come online. To reserve an assignment for a port, a free assignment must be available.

1. Enter the **show dpod** command to determine the unassigned ports.

   If all ports are assigned, select a port to release its POD assignment. Follow the instructions in Releasing a port from a POD set on page 37 to release a port from its POD assignment. Once the port is released, you can reuse the assignment for another port.
2. Enter the global configuration mode by issuing the **configure terminal** command.
3. Select the port for which you want to reserve an assignment and enter the **dpod reserve** command.
4. Enter the **exit** command to return to the global configuration mode before you reserve another port.

```
device# configure terminal
Entering configuration mode terminal
device(config)# dpod 0/15 reserve
device(config-dpod-0/15)# exit
```



Note
Which reboot of the switch is NOT required to make DPOD licensing effective, be aware that License reservations or removals do not persist across switch reboots and power cycles. To make them persistent, save the configuration changes by issuing the use **copy running-config startup-config** command before you reboot the switch.

5. Save the configuration changes.

```
device# copy running-config startup-config
```

6. Reboot the switch.
7. Enter the **show running-config dpod** command to verify the port is reserved.

```
device# show running-config dpod 0/15
dpod 0/15
 reserve
!
```

Releasing a port from a POD set

Once a port has been assigned to a Dynamic POD license port set, it remains licensed (or "reserved") until you remove the port from the port set. You remove a port from the port set by releasing the port with the **dpod release** command. Releasing a port removes it from the Dynamic POD license port set; the port appears as unassigned until it comes back online.

To prevent a port from coming back online and taking a POD assignment, disable the port and save the running configuration. This action will disable the port persistently.

A port POD assignment can only be released if the port is currently offline. Use the **shutdown** command to disable the port or use the **chassis disable** command to disable the switch if you plan to release multiple ports.

1. Enter the global configuration mode by issuing the **configure terminal** command.
2. Select the interface for the port that you wish to disable using the **interface** *slot/port* command.
3. Enter the **shutdown** command to take the port offline.
4. Enter the **exit** command to return to the global configuration mode before you release the port.
5. Enter the **dpod release** command to remove the port from the POD license.
6. Enter the **exit** command to return to the global configuration mode before you reserve another port.

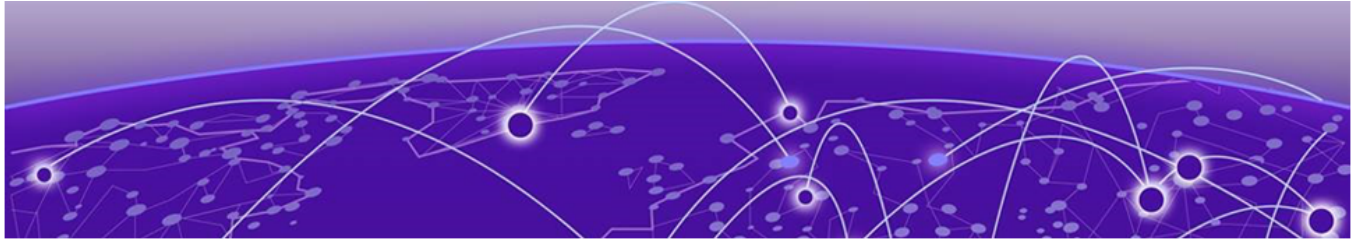
```
device# configure terminal
Entering configuration mode terminal
device(config)# interface 0/15
device(conf-if-te-0/15)# shutdown
device(conf-if-te-0/15)# exit
device(config)# dpod 0/15 release
device(config-dpod-0/15)# exit
```

7. Enter **exit** to return to privileged EXEC mode.
8. Enter the **show dpod** command to verify that the port is no longer assigned to a POD set.
9. Enter the **enable chassis** command to bring the switch back online.
10. Save the configuration changes.

```
device# copy running-config startup-config
```



Note
Do not release a port unless you plan to disconnect the optical link or disable the port persistently. If you leave the link in a state where the port could be brought online, the POD mechanism will detect this unassigned port and attempt to reassign it to a port set.



SLX-OS Licensed Features and Part Numbers

SLX-OS Licensed Features and Part Numbers on page 39

SLX-OS Licensed Features and Part Numbers

The table below lists the supported part numbers and ports or POD licenses for the SLX 9740, SLX 9640, SLX 9540, SLX 9250, SLX 9150, Extreme 8820, Extreme 8720, and Extreme 8520 devices.

Table 8: Part Numbers

Product	Ports/POD licenses	Part Number	Orderable Aftermarket license	Description
SLX 9740	Advanced feature license	SLX9740-40C	SLX9740-ADV-LIC-P	Advanced Feature License
		SLX9740-40C-AC-F		
		SLX9740-80C		
		SLX9740-80C-AC-F		
SLX 9640	Advanced feature license	EN-SLX-9640-24S	BR-SLX-9640-ADV-LIC	ADVANCED FEATURE LICENSE
		EN-SLX-9640-24S-AC-F		
		EN-SLX-9640-24S-12C		
		EN-SLX-9640-24S-12C-AC-F		
	100 Port upgrade license	EN-SLX-9640-24S	EN-SLX-9640-4C-POD-P	Feature 100G Port Upgrade
		EN-SLX-9640-24S-AC-F		

Table 8: Part Numbers (continued)

Product	Ports/POD licenses	Part Number	Orderable Aftermarket license	Description
SLX 9540	Advanced feature license	BR-SLX-9540-24S-AC-F	BR-SLX-9540-ADV-LIC-P	ADVANCED FEATURE LICENSE
	Upgrade license	BR-SLX-9540-24S-AC-R	BR-SLX-9540-24S-COD-P	UPGRADE 24X1GE TO 24X10GE/1GE
	POD license	BR-SLX-9540-24S-DC-F	BR-SLX-9540-2C-POD-P	PORTS ON DEMAND FOR 2X100GE/40GE
SLX 9250	Advanced feature license	SLX9250-ADV-LIC-P		ADVANCED FEATURE LICENSE
SLX 9150	Advanced feature license	SLX9150-ADV-LIC-P		ADVANCED FEATURE LICENSE
Extreme 8720 and Extreme 8520	Advanced feature set - Integrated Application Hosting , BGP-EVPN	8000-PRMR-LIC-P		ADVANCED FEATURE LICENSE
Extreme 8820	Advanced feature set - Integrated Application Hosting , BGP-EVPN	8000-PRMR-LIC-P		ADVANCED FEATURE LICENSE