

# Extreme SLX-OS Software Licensing Guide, 17r.1.01

**Supporting the ExtremeRouting SLX 9850 and  
ExtremeSwitching SLX 9540 Devices**

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# Preface

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## Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Extreme technical documentation.

## Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

### NOTE

A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

### ATTENTION

An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.



### CAUTION

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.



### DANGER

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

## Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used to highlight specific words or phrases.

Format	Description
<b>bold text</b>	Identifies command names. Identifies keywords and operands. Identifies the names of GUI elements.
<i>italic text</i>	Identifies text to enter in the GUI. Identifies emphasis. Identifies variables.
Courier font	Identifies document titles. Identifies CLI output.

Format	Description
	Identifies command syntax examples.

## Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
<b>bold text</b>	Identifies command names, keywords, and command options.
<i>italic text</i>	Identifies a variable.
[ ]	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, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member[member...]</i> .
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

## Extreme resources

Visit the Extreme website to locate related documentation for your product and additional Extreme resources.

White papers, data sheets, and the most recent versions of Extreme software and hardware manuals are available at [www.extremenetworks.com](http://www.extremenetworks.com). Product documentation for all supported releases is available to registered users at [www.extremenetworks.com/support/documentation](http://www.extremenetworks.com/support/documentation).

## Document feedback

Quality is our first concern at Extreme, and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you.

You can provide feedback in two ways:

- Use our short online feedback form at <http://www.extremenetworks.com/documentation-feedback-pdf/>
- Email us at [internalinfodev@extremenetworks.com](mailto:internalinfodev@extremenetworks.com)

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.

# Contacting Extreme Technical Support

As an Extreme customer, you can contact Extreme Technical Support using one of the following methods: 24x7 online or by telephone. OEM customers should contact their OEM/solution provider.

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

- [GTAC \(Global Technical Assistance Center\)](#) for immediate support
  - Phone: 1-800-998-2408 (toll-free in U.S. and Canada) or +1 408-579-2826. For the support phone number in your country, visit: [www.extremenetworks.com/support/contact](http://www.extremenetworks.com/support/contact).
  - Email: [support@extremenetworks.com](mailto:support@extremenetworks.com). To expedite your message, enter the product name or model number in the subject line.
- [GTAC Knowledge](#) - Get on-demand and tested resolutions from the GTAC Knowledgebase, or create a help case if you need more guidance.
- [The Hub](#) - A forum for Extreme customers to connect with one another, get questions answered, share ideas and feedback, and get problems solved. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.
- [Support Portal](#) - Manage cases, downloads, service contracts, product licensing, and training and certifications.

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

- Your Extreme Networks service contract number and/or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any action(s) 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





# About This Document

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## What's new in this document

On October 30, 2017, Extreme Networks, Inc. acquired the data center networking business from Brocade Communications Systems, Inc. This document has been updated to remove or replace references to Brocade Communications, Inc. with Extreme Networks, Inc., as appropriate.

The following table includes descriptions of new information added to this guide for the SLX OS 17r.1.01 software release.

**TABLE 1** Summary of enhancements in SLX OS release 17r.1.01

Feature	Description	Described in
Advanced Features SAU license	New features added to the Advanced Features SAU license. New features include BGP EPVN, 3rd Party VM, MPLS, and gRPC.	<a href="#">Licensing rules</a> on page 12

For complete information, refer to the *SLX-OS 17r.1.01 Release Notes*.

## Supported hardware and software

In those instances in which procedures or parts of procedures documented here apply to some devices but not to others, this guide identifies exactly which devices are supported and which are not.

Although many different software and hardware configurations are tested and supported by Extreme Networks for SLX-OS Release 17r.2.01, documenting all possible configurations and scenarios is beyond the scope of this document.

The following hardware platforms are supported by this release:

- ExtremeRouting SLX 9850-4 router
- ExtremeRouting SLX 9850-8 router
- ExtremeSwitching SLX 9540 switch

To obtain information about other releases, refer to the documentation specific to that release.

## Interface module capabilities

The following table lists the supported capabilities for the following SLX 9850 interface modules:

- BR-SLX9850-10Gx72S-M
- BR-SLX9850-100Gx36CQ-M
- BR-SLX9850-10Gx72S-D
- BR-SLX9850-100Gx36CQ-D
- BR-SLX9850-100Gx12CQ-M

**TABLE 2** SLX 9850 interface modules capabilities

Capability	Modular interface module
MPLS	Yes
Packet Buffer memory per interface module	12GB (BR-SLX9850-10Gx72S-M) 36GB (BR-SLX9850-100Gx36CQ-M) 8GB (BR-SLX9850-10Gx72S-D) 24GB (BR-SLX9850-100Gx36CQ-D)

# Software Licensing Overview

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## Software-based licensing overview

You can purchase Extreme 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 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 as proof of purchase. The *VID* and license ID (*LID*) of the Extreme 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* [ slot *slot number* ]** command. Once a license is installed on the SLX-OS switch, you may be prompted to disable and reenable the chassis or specific ports to activate the license. The license key is stored in the flash file system on the SLX 9540 switch, and the license keys are stored on the interface modules on the SLX 9850 router.

### 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 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 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 3** License requirements by platform

Platform/LC	100 GbE/40 GbE ports	100 GbE ports	10 GbE/1 GbE ports	License type	POD sets and sizes
SLX 9850/ 100G LC	24	N/A	N/A	100 GbE/ 40 GbE Port Upgrade	Four 100 GbE/40 GbE POD licenses (6 ports each) add 24 ports to the -D and -M SLX9850-100Gx12CQ line cards to bring the total number of ports to 36.
					100 GbE/40 GbE POD license (24 ports) are pre-installed in -D and -M SLX9850-100Gx36CQ line cards.
SLX 9850/ 10G LC	N/A	N/A	36	10 GbE Port Upgrade	10 GbE POD license (36 ports) are already pre-installed in the -D line card and -M BR-SLX9850-10Gx72S line cards.
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.
				Capacity on Demand (COD) for 10GbE ports	100 GbE POD licenses (6 ports) are already pre-installed in the SLX-9540-48S switches.
					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.
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 4** Extreme licenses for SLX-OS

License	Description	Notes
100 GbE/ 40 GbE Port Upgrade (for SLX 9850)	For the SLX 9850, the 100 GbE/ 40 GbE Port Upgrade license adds 24 100 GbE ports for a total of 36 100 GbE/ 60 40 GbE licensed ports. The base port size is 12 100 / 20 40 GbE ports. The base port capacity with the -D and -M LC's use the first two towers (tower 1 and 2) on the LC that enable 12 ports at 100 GbE, or 20 ports at 40 GbE. A tower is a block of 6 x100 GbE ports, or 10x40 GbE ports.	<p>There are two models, -D and -M Line Cards (LC), for the 100GbE/40 GbE base ports and 10 GbE base ports.</p> <p>-M LC license enables the MPLS router functionality on an LC. At least one -M LC must be installed into a chassis to configure MPLS features. The combination of the -D LC and -M LC in a chassis is not permitted when MPLS router features are configured. Only -M LC's can be installed when MPLS features are configured. The MPLS router feature cannot be configured when there is no LC installed in the chassis. If the -D LC is installed into a chassis when MPLS features are configured, the -D LC will be disabled and prevented from being used. You must do the following when a -D LC is disabled because MPLS features are enabled:</p> <ul style="list-style-type: none"> <li>- Remove the -D LC and replace it with a -M LC.</li> <li>- Remove the MPLS feature configuration and reinsert the -D LC.</li> </ul> <p>The -D Line Card feature set includes L2 protocols, including L2 MCT, L3 protocols ( static + dynamic), Standard interfaces SNMP, Netconf, REST, Python scripting, Openflow, as well as BGP EPVN, 3rd Party VM, MPLS, and gRPC.</p> <p>The -M or MPLS line card feature set includes all DC LC features, EVPN/MPLS, VPLS, VLL, L3 VPN (Rel 2.0), IGP Shortcuts, LSP load balancing. To enable MPLS features on the SLX 9850 LC, the MPLS license is required. All LC's must have the MPLS license present to configure MPLS features. &gt;</p> <p>The -M line card also includes the OptiScale feature for Internet Routing.</p>
10 GbE Port Upgrade (for SLX 9850)	The 10 GbE Port Upgrade license adds 36 10 GbE ports for a total of 72 10 GbE licensed ports. The base port size is 36 10 GbE ports. The base port capacity uses the first tower; a tower is block of 36 ports. The second tower of 36 ports is enabled when the 10 GbE Port Upgrade license is installed.	
MPLS (for SLX 9850)	MPLS license is pre-installed on -M 100GbE/40 GbE and 10 GbE Line Cards. It cannot be installed on -D Line cards.	
100 GbE Port Upgrade (for 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) (for 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.	
Advanced License (for SLX 9540)	The Advanced feature SAU license enables the advanced licensed features prior to purchasing a license. On the SLX 9540 platforms, the Advanced Feature license set includes BGP EPVN, 3rd Party VM, MPLS, gRPC, and OptiScale for Internet Routing. The Base Features set includes L2 Protocols including L2 MCT,	To enable MPLS features on the SLX 9540 the Advanced feature SAU license is required.

**TABLE 4** Extreme licenses for SLX-OS (continued)

License	Description	Notes
	L3 Protocols (Static + Dynamic), Standard interfaces SNMP, Netconf, REST, Python scripting, and Openflow. By default, all of the features enabled by the Advanced Features SAU license on the SLX 9540 are included in the Base support for the -D and -M Line Cards on the SLX 9850.	

## 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.

## 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. Please note that the line cards on the SLX 9850 each have their own LID's that are different from the chassis LID. 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 SLX 9850 or SLX 9540 devices.
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

Before you can use a software license, you must generate it from the Extreme portal.

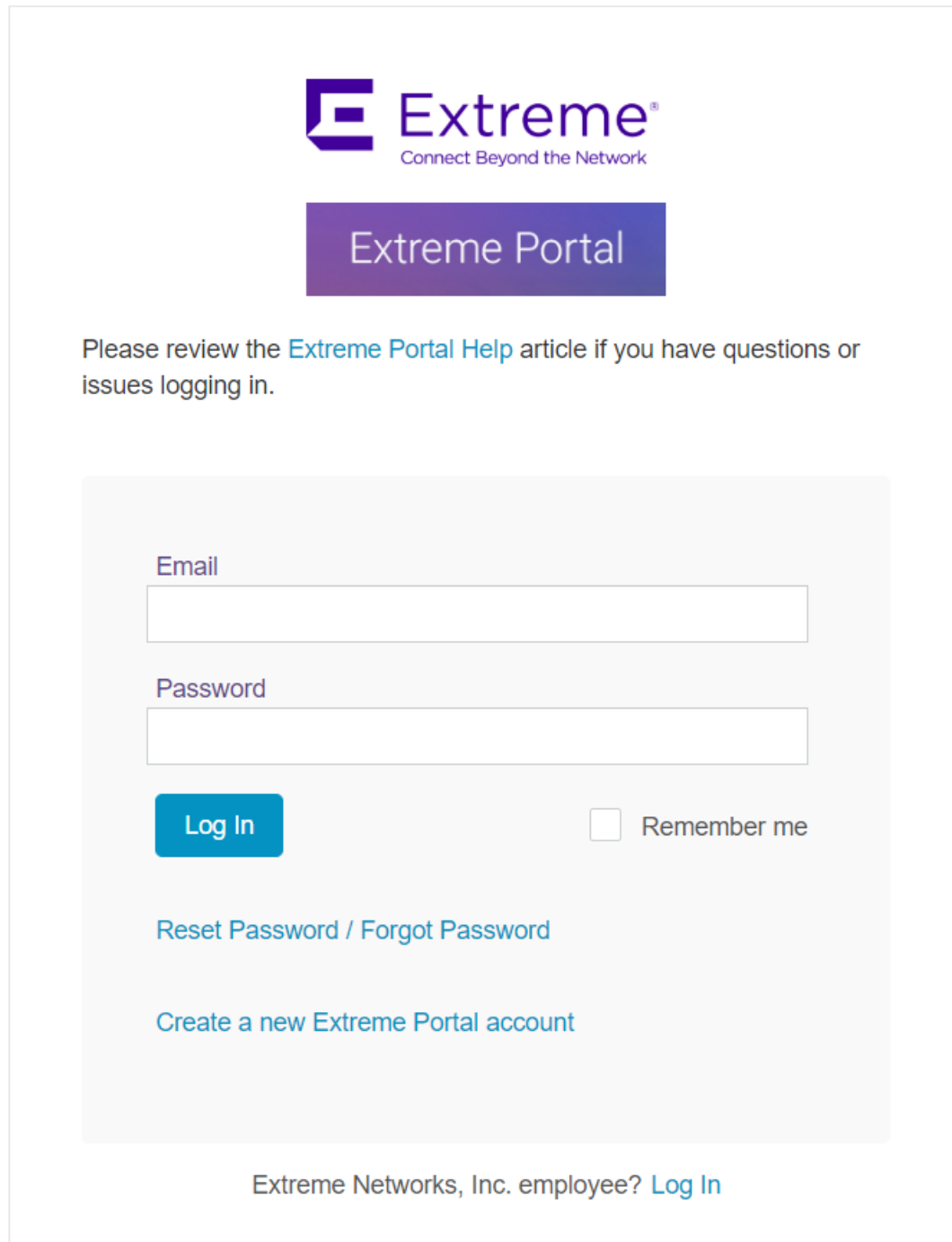
The following procedure demonstrates how to generate and obtain a software license.


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

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

The following figure shows the Extreme Portal login window.

FIGURE 1 Extreme portal login window



 **Extreme**<sup>®</sup>  
Connect Beyond the Network

**Extreme Portal**

Please review the [Extreme Portal Help](#) article if you have questions or issues logging in.

Email

Password

Remember me

[Reset Password / Forgot Password](#)

[Create a new Extreme Portal account](#)

Extreme Networks, Inc. employee? [Log In](#)

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

FIGURE 2 Licenses Home window

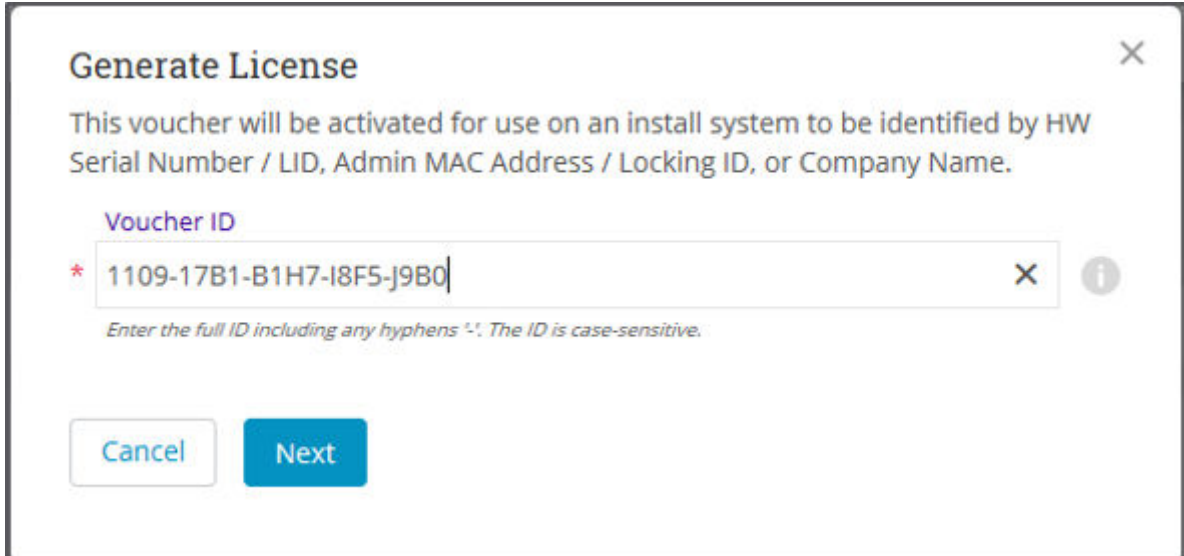
The screenshot displays the 'Licenses Home' interface. At the top, the Extreme logo is on the left, and user information 'Francois TestCustomer Billaut | Log Out' and 'University of West Georgia' is on the right. A navigation bar includes 'Extreme Portal', 'Support', 'Products', 'Downloads', and 'Assets'. The 'Assets' tab is selected, showing a search bar and a dropdown menu with 'Assets Home' and 'Licenses Home'. The main content area is titled 'Licenses Home' and contains three sections: 'Generate License' (with a 'Generate License' button), 'Upgrade License' (with an 'Upgrade' button), and 'Evaluation Voucher' (with a 'Request' button). Below these sections is a filter bar with a search input 'Filter all Vouchers and Licenses (for example by Serial Number)' and a 'Refine' button. Further down are filter controls for 'Voucher Product', 'Show Active & Available', and 'Show Evaluations', along with a 'Clear All Filters' button. At the bottom, a table lists two licenses with columns for Voucher ID, Voucher Product, Product Code, HW Serial Number, Redemption Date, and Activated status.

Voucher ID ▲	Voucher Product ▲	Product Code ▲	HW Serial Number ▲	Redemption Date ▼	Activated ▲	Tags ▲
Eval-002369	NETSIGHT Evaluation	NETSIGHTEVAL		8/24/2017	1 of 1	EVALUATION
1201-15G6-F5G6-J9J9-F5J9	NMS - 500 DEVICES / 5000 THI...	NMS-500		12/1/2015	1 of 1	



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

FIGURE 3 Generate License window



**Generate License**

This voucher will be activated for use on an install system to be identified by HW Serial Number / LID, Admin MAC Address / Locking ID, or Company Name.

**Voucher ID**

\* 1109-17B1-B1H7-I8F5-J9B0

*Enter the full ID including any hyphens ^!: The ID is case-sensitive.*

Cancel Next

5. Enter the VID. Click **Next**.  
The VID (previously known as Transaction Keys at Brocade) has 20 alphanumeric characters with hyphens.

#### NOTE

Unredeemed Transaction Keys from Brocade can still be redeemed.

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

**Generate License**

This voucher will be activated for use on an install system to be identified by HW Serial Number or LID.

**BR-VDX6720-60VCS-01 S/W, VCS LICENSE FOR VDX6720-60/40**

Please [Create a Case](#) so GTAC can investigate this issue.

**Voucher ID**

\* 1109-1718-J9E4-F5C2-B1F5 ⓘ  
Enter the full ID including any hyphens '-'. The ID is case-sensitive.

**HW Serial Number or LID**

\* 10:00:50:EB:1A:CD:A2:E0 ⓘ  
Enter the full ID including any hyphens '-'. The ID is case-sensitive.

\*  You must check this box to acknowledge you agree to the [Terms & Conditions](#)

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

FIGURE 5 Voucher Details window

Extreme Portal

Support Products Downloads **Assets**

Search

< Licenses Home

## Voucher Details

[Edit](#)  
Enter a description here

Voucher ID	1109-17D3-B0J9-E4C2-B1J9	Activated Licenses	1 of 1
Voucher Product	MLX 4-PORT 10-GBE LICENSE UPGD TO (X)	Redeemed By	Francois Billaut
Product Code	BR-MLX-10GX4-XUPG	Redemption Date	11/14/2017
HW Serial Number	2017191	Install Address	RAYTHEON COMPANY, 1001 BOSTON POST RD, Marlborough, MA 01752, United States
HW LID	emtHKJInFLG		
HW Product	MLX 20-PORT 10-GBE/1GBE (M) COMBO MODULE		

License Key ▲	Fulfillment Date ▼	Generated By ▲	Status ▲
<a href="#">Download</a> <b>NEW</b>	11/14/2017	Francois Billaut	Active

- 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.brocade.com/licensefile">
- <licenseHeader>
  <serialNumber>PLVNN-00005</serialNumber>
  <productNumber>BR-VDX6720-60VCS-01</productNumber>
  <description>VCS_FABRIC</description>
  <version>1.0</version>
  <dateGenerated>2017111412191494</dateGenerated>
</licenseHeader>
- <license>
  <featureName>VCS_FABRIC</featureName>
  <featureVersion>1.0</featureVersion>
  <licKey>*B AY8P8Hmf0qjEM9ro:5,KLdtfmUzo8CZSRgCjTxiqmKLSi4KB28jY5Wg6p5TvDQZQ3Rlh38TbqRTERrloBJxApcfVTIjYbY1FXsLQBokM24gffE#</licKey>
</license>
</lic:licenseInfo>
```

## Querying a license

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

- 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

The screenshot shows the 'Extreme Portal' interface. At the top, there are navigation tabs: 'Support', 'Products', 'Downloads', and 'Assets' (which is highlighted). Below the navigation is a search bar. The main content area is titled 'Licenses Home' and contains three main sections: 'Generate License', 'Upgrade License', and 'Evaluation Voucher'. Each section has a corresponding blue button: 'Generate License', 'Upgrade', and 'Request'. Below these sections is a search input field containing the Voucher ID '1109-1718-B0H7-H7D3-I818'. To the right of the input field is a 'Refine' button with an information icon. Below the search field are three filter dropdown menus: 'Filter results by' (set to 'Voucher Product'), 'Show Active & Available', and 'Show Evaluations'. A 'Clear All Filters' button is also present. At the bottom, there is a table with the following data:

Voucher ID ▲	Voucher Product ▲	Product Code ▲	HW Serial Number ▲	Redemption Date ▼	Activated ▲
1109-1718-B0H7-H7D3-I818	S/W,VCS LICENSE FOR VDX67...	BR-VDX6720-60VCS-01	PLVNN-00005	11/14/2017	1 of 1

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

The screenshot displays the 'Voucher Details' page in the Extreme Portal. The page header includes 'Extreme Portal' and navigation tabs for 'Support', 'Products', 'Downloads', and 'Assets'. A search bar is located at the top right. Below the navigation, there is a '< Licenses Home' link and the title 'Voucher Details'. An 'Edit' link is present with the text 'Enter a description here'. The main content area is divided into two columns of key-value pairs:

Voucher ID	1109-17D3-B0J9-E4C2-B1J9	Activated Licenses	1 of 1
Voucher Product	MLX 4-PORT 10-GBE LICENSE UPGD TO (X)	Redeemed By	Francois Billaut
Product Code	BR-MLX-10GX4-XUPG	Redemption Date	11/14/2017
HW Serial Number	2017191	Install Address	RAYTHEON COMPANY, 1001 BOSTON POST RD, Marlborough, MA 01752, United States
HW LID	emTHKJInFLG		
HW Product	MLX 20-PORT 10-GBE/1GBE (M) COMBO MODULE		

At the bottom, there is a table with columns: License Key ▲, Fulfillment Date ▼, Generated By ▲, and Status ▲. The table contains one row with the following data:

License Key ▲	Fulfillment Date ▼	Generated By ▲	Status ▲
<a href="#">Download</a> <b>NEW</b>	11/14/2017	Francois Billaut	Active



# Software Licensing Tasks

---

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## 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*] [ slot *slot number* ] command on the slot 1 of the line card. 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 slot 1

License Added [*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjppHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9y1O:cf00If68JA1f1HZz
MQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#]
```

- Enter the **license add licstr** command followed by the license key on slot 1. 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 licstr "*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjppHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9y1O:cf00If68JA1f1HZz
MQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#" slot 1

License Added [*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjppHK9gJLrcLzYIbEXVmDCd8N4nRyTfdxoGQI93gRS9y1O:cf00If68JA1f1HZz
MQs4:eiIlC,VbOpx4E6UG8YeXWcaVIBSTVv#]
```

- 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 5** 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 <b>config license dpod</b> 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 <b>license eula</b> 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 100 GbE / 40 GbE port upgrade license and the MPLS license on slot 1. Slot 2 displays the 10 GbE port upgrade license.

```
device# show license
Slot 1
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
 100G/40G Port Upgrade license
  Feature name:PORT_100G_40G_UPGRADE
  Capacity: 24x100G or 40X40G
  License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
 Multiprotocol Label Switching license
  Feature name: MPLS
  License is Node-Lock and valid
Slot 2
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
 10G Port Upgrade license
  Feature name:PORT_10G_UPGRADE
  Capacity: 36x10G
  License is Node-Lock and valid
```

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

```
device# show license
Slot: 3
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:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
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.

```
device# tpmadm 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.

```
No ADVANCED_FEATURES EULA accepted for this feature
```

# 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                                10:00:00:05:33:65:6B:B8
Slot 1                                  10:00:00:05:33:69:0A:0B
```

# 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 6** 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, 3rd PARTY VM, guest VM, 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 a 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, and slot number.

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 ( the slot number is not required on the SLX 9540). 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 and slot number.

```
device# show license
Slot 1
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
 100G/40G Port Upgrade license
  Feature name:PORT_100G_40G_UPGRADE
  Capacity: 24x100G or 40X40G
  License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  Multiprotocol Label Switching license
  Feature name: MPLS
  License is Node-Lock and valid
  Slot 2
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
 10G Port Upgrade license
  Feature name:PORT_10G_UPGRADE
  Capacity: 36x10G
  License is Node-Lock and valid

device# license remove licstr 10G_PORT_UPGRADE slot 2
2014/11/13-16:40:53, [SEC-3051], 5613, SW/0 | Active, INFO, MYSWITCH, The license key
10G_PORT_UPGRADE is Removed from Slot 2.
License Removed [10G_PORT_UPGRADE]
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
Slot 1
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
 100G/40G Port Upgrade license
  Feature name:PORT_100G_40G_UPGRADE
  Capacity: 24x100G or 40X40G
  License is Node-Lock and valid
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  Multiprotocol Label Switching license
  Feature name: MPLS
  License is Node-Lock and valid
  Slot: 2
  No entries available
```

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
Slot 1
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      100G/40G Port Upgrade license
      Feature name:PORT_100G_40G_UPGRADE
      Capacity: 24x100G or 40X40G
      License is Node-Lock and valid

Slot 2
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      10G Port Upgrade license
      Feature name:PORT_10G_UPGRADE
      Capacity: 36x10G
      License is Node-Lock and valid
```

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.

You can disable and then enable each affected port, or you can enter the **chassis disable** command followed by the **chassis enable** command to re-enable the entire chassis.

```
device# chassis disable
device# chassis enable
```

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 licstr** 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:fZVuQByBOJMeqIoPhjphK9gJLrcLzYIbEXVmDcD8N4nRyTfdxoGQI93gRS9y10:cf00If68JA1f1HZzMQs4
:eiIlC,VbOpX4E6UG8YeXWcaVIBSTVv#" slot 1
2014/11/13-16:41:16, [SEC-3051], 5615, SW/0 | Active, INFO, MYSWITCH, The license key *B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjphK9gJLrcLzYIbEXVmDcD8N4nRyTfdxoGQI93gRS9y10:cf00If68JA1f1HZzMQs4
:eiIlC,VbOpX4E6UG8YeXWcaVIBSTVv# is Added to Slot 1.
License Added [*B
OXw:jFQ0IZc,t1D12:fZVuQByBOJMeqIoPhjphK9gJLrcLzYIbEXVmDcD8N4nRyTfdxoGQI93gRS9y10:cf00If68JA1f1HZzMQs4
:eiIlC,VbOpX4E6UG8YeXWcaVIBSTVv#]
For license change to take effect, it may be necessary to enable ports...
device# chassis disable
device# chassis enable
```

# Dynamic Ports on Demand Licensing

---

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## 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 9850 and SLX 9540 switches.

### NOTE

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

## Port-to-tower mapping on the SLX 9850

On the SLX 9850, all ports on a tower are connected to the same ASIC on the LC. On each 100 GbE/40 GbE LC, there are six ASIC ports (or six towers). The 100 GbE/ 40 GbE interface module has a base port capacity of 12 GbE ports. The base port capacity with the -D and -M LC's use the first two towers (tower 1 and 2) on the LC that enable 12 ports at 100 GbE, or 20 ports at 40 GbE. The 10 GbE interface module has a base port capacity of 36 GbE ports. The base port capacity uses the first tower; a tower is block of 36 ports. The second tower of 36 ports are enabled when the 10 GbE Port Upgrade license is used.

The port-to-tower mapping for the 100 GbE/ 40 GbE LC and the 10 GbE LC is shown below. Towers 1 -6 are for the 100 GbE/ 40 GbE LC and tower 1 and 2 are for the 10 GbE LC.

FIGURE 9 Port-to-tower mapping for 100 GbE/40 GbE LC

### 100 Gbe/40 GbE LC

tower-1: {1, 2, 3, 4, 5, 6, 7, 26, 27, 28 }

tower-2: {8, 9, 10, 11, 12, 13, 29, 30, 31, 32 },

tower-3: {15, 16, 17, 18, 19, 20, 14, 33, 34, 35 },

tower-4: {41, 42, 43, 44, 45, 46, 21, 22, 23, 24 },

tower-5: {48, 49, 50, 51, 52, 53, 25, 36, 47, 54 },

tower-6: {55, 56, 57, 58, 59, 60, 37, 38, 39, 40 },

**Bolded** ports are 100G capable (if the tower's port-group mode is in 100G mode, only the bolded ports are visible on noscli)

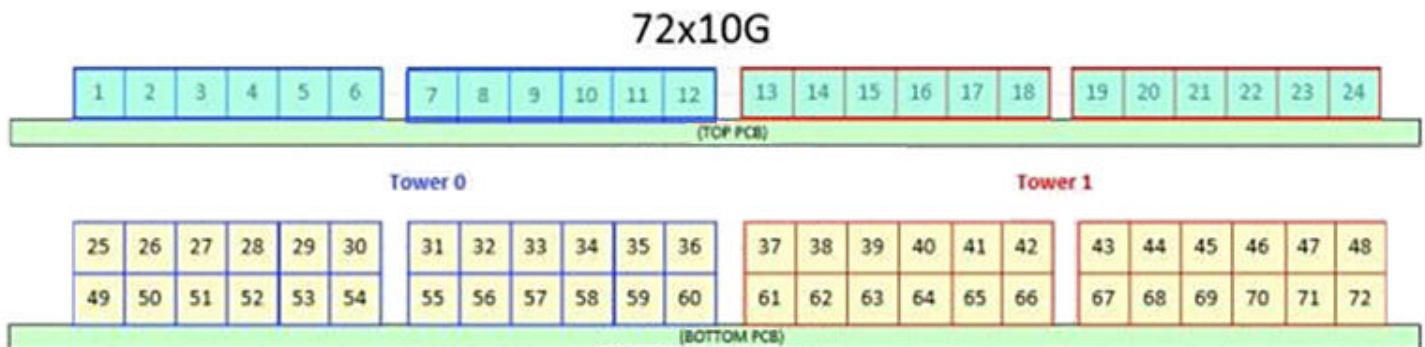


FIGURE 10 Port-to-tower mapping for 10 GbE LC

## 10 GbE LC

tower-1: Ports 1-12, 25-36, 49-60 (Total: 36 ports)

tower-2: Ports 13-24, 37-48, 61-72 (Total: 36 ports)



## Managing automatic POD port assignments

The Dynamic POD feature is only used on the 100 GbE ports of the SLX 9540 platform (a form of the Static POD method is used for SLX 9850 chassis Line Cards). 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 33 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 34 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.  
Alternatively, you can disable and re-enable the chassis to activate 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
Interface          IP-Address      Status          Protocol
=====          =
Ethernet 8/1       unassigned      up              up
Ethernet 8/2       unassigned      up              up
Ethernet 8/3       unassigned      up              up
Ethernet 8/4       unassigned      up              up
Ethernet 8/5       unassigned      up              up
Ethernet 8/6       unassigned      up              up
Ethernet 8/8       unassigned      up              up
Ethernet 8/9       unassigned      up              up
Ethernet 8/10      unassigned      up              up
Ethernet 8/11      unassigned      up              up
Ethernet 8/12      unassigned      up              up
Ethernet 8/13      unassigned      up              up
Ethernet 8/15      unassigned      administratively down  down (No 100G/40G Port Upgrade License)
Ethernet 8/16      unassigned      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 8/14
Ethernet 8/14 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 34 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

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## SLX 9850 and SLX 9540 part numbers

The table below lists the supported part numbers and ports or POD licenses for the SLX 9850 and SLX 9540 devices.

**TABLE 7** Part Numbers

Product	Ports/POD licenses	Part Number	Description
SLX 9850 for 72X10 GbE	All ports enabled ( Base ports + POD license)	BR-SLX9850-10Gx72S-D	72x10GE DC blade with all ports enabled
	All ports enabled ( Base ports + POD license)	BR-SLX9850-10Gx72S-M	72x10GE MPLS blade with all ports enabled
	Base ports	BR-SLX9850-10Gx36S-D	72x10GE DC blade with only 36x10GE enabled
	Base ports	BR-SLX9850-10Gx36S-M	72x10GE MPLS blade with only 36x10GE enabled
	POD license	BR-SLX9850-10GX36S-D-UPG	License upgrade SKU for 36x10GE in the DC blade
	POD license	BR-SLX9850-10Gx36S-M-UPG	License upgrade SKU for 36x10GE in the MPLS blade
SLX 9850 for 36x100 GbE	All ports ( Base ports + POD license)	BR-SLX9850-100Gx36CQ-D	36x100GE DC blade with all ports enabled
	All ports ( Base ports + POD license)	BR-SLX9850-100Gx36CQ-M	36x100GE MPLS blade with all ports enabled
	Base ports	BR-SLX9850-100Gx12CQ-D	36x100GE DC blade with only two towers (12x100GE) enabled
	Base ports	BR-SLX9850-100Gx12CQ-M	36x100GE MPLS blade with only two towers (12x100GE) enabled
	POD license	BR-SLX9850-100Gx6CQ-D-UPG	License upgrade SKU per tower (6x100GE) in the DC blade
	POD license	BR-SLX9850-100Gx6CQ-M-UPG	License upgrade SKU per tower (6x100GE) in the MPLS blade
SLX 9540	Upgrade license	BR-SLX-9540-24S-COD-P	Upgrade 24X1 GbE ports to 24X10 GbE/ 1 GbE ports
	POD license	BR-SLX-9540-2C-POD-P	Ports on Demand license to enable 2X100 GbE/ 40 GbE ports
	Advanced feature license	BR-SLX-9540-ADV-LIC-P	Advanced Feature License for MPLS, BGP-EVPN, CE 2.0, NSX (SLX 9540-24S, SLX 9540-48S)