



# ExtremeXOS Release Notes

*Software Version ExtremeXOS 22.7*



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# Preface

This section discusses the conventions used in this guide, ways to provide feedback, additional help, and other Extreme Networks® publications.





## Conventions

This section discusses the conventions used in this guide.

### Text Conventions

The following tables list text conventions that are used throughout this guide.

**Table 1: Notice Icons**

Icon	Notice Type	Alerts you to...
	General Notice	Helpful tips and notices for using the product.
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.
<i><b>New!</b></i>	New Content	Displayed next to new content. This is searchable text within the PDF.

**Table 2: Text Conventions**

Convention	Description
Screen displays	This typeface indicates command syntax, or represents information as it appears on the screen.
The words <b>enter</b> and <b>type</b>	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.”
<b>[Key]</b> names	Key names are written with brackets, such as <b>[Return]</b> or <b>[Esc]</b> . If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press <b>[Ctrl]+[Alt]+[Del]</b>
<i>Words in italicized type</i>	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.

## Platform-Dependent Conventions

Unless otherwise noted, all information applies to all platforms supported by ExtremeXOS software, which are the following:

- ExtremeSwitching® switches
- Summit® switches
- SummitStack™

When a feature or feature implementation applies to specific platforms, the specific platform is noted in the heading for the section describing that implementation in the ExtremeXOS command documentation (see the Extreme Documentation page at [www.extremenetworks.com/documentation/](http://www.extremenetworks.com/documentation/)). In many cases, although the command is available on all platforms, each platform uses specific keywords. These keywords specific to each platform are shown in the Syntax Description and discussed in the Usage Guidelines sections.

## Terminology

When features, functionality, or operation is specific to a switch family, such as ExtremeSwitching, the family name is used. Explanations about features and operations that are the same across all product families simply refer to the product as the switch.

## Providing Feedback to Us

Quality is our first concern at Extreme Networks, and we have made every effort to ensure the accuracy and completeness of this document. We are always striving to improve our documentation and help you work better, so we want to hear from you! We welcome all feedback but especially want to know about:

- Content errors or confusing or conflicting information.
- Ideas for improvements to our documentation so you can find the information you need faster.
- Broken links or usability issues.

If you would like to provide feedback to the Extreme Networks Information Development team, you can do so in two ways:

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

Please 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.

## Getting Help

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

- |                       |   |
|-----------------------|---|
| <b>Extreme Portal</b> | 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: 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)

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

## Subscribing to Service Notifications

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

- 1 Go to [www.extremenetworks.com/support/service-notification-form](http://www.extremenetworks.com/support/service-notification-form).
- 2 Complete the form with your information (all fields are required).
- 3 Select the products for which you would like to receive notifications.



### Note

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

- 4 Click **Submit**.

## Related Publications

### ExtremeXOS Publications

- *ACL Solutions Guide*
- *ExtremeXOS 22.7 Command Reference Guide*
- *ExtremeXOS 22.7 EMS Messages Catalog*
- *ExtremeXOS 22.7 Feature License Requirements*
- *ExtremeXOS 22.7 User Guide*
- *ExtremeXOS OpenFlow User Guide*
- *ExtremeXOS Quick Guide*
- *ExtremeXOS Legacy CLI Quick Reference Guide*
- *ExtremeXOS Release Notes*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*

- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*
- *Using AVB with Extreme Switches*

## Extreme Management Center Publications

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# 1 Overview

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## Security Information

### Upgrading ExtremeXOS

### Default ExtremeXOS Settings

### New and Corrected Features in ExtremeXOS 22.7

### Extreme Loop Recovery Protocol (ELRP) MAC Address Change

### Updating the Programmable Logic Firmware on the Summit X440-G2 and ExtremeSwitching X620 Series Switches

### Extreme Hardware/Software Compatibility and Recommendation Matrices

### Compatibility with Extreme Management Center (Formerly NetSight)

### Supported MIBs

### Tested Third-Party Products

### Extreme Switch Security Assessment

### Service Notifications

These release notes document ExtremeXOS 22.7, which adds features and resolves software deficiencies.

## Security Information

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The following section covers important security information for ExtremeXOS 22.7.

### OpenSSL Version

ExtremeXOS 22.7 uses FIPS fips-ecp-2.0.16.

### Linux Kernel

ExtremeXOS 22.7 uses Linux Kernel 3.18.

## Upgrading ExtremeXOS

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While ExtremeXOS 22.7 supports all features on all applicable platforms as indicated in these release notes, upgrading to ExtremeXOS 22.7 from releases earlier than 22.2 may involve performance trade-offs of some feature on certain platforms. For information about feature- and platform-specific issues, see [Open Issues](#) on page 62 and [Known Behaviors](#) on page 62. For information about recommended releases for specific platforms, see <http://www.extremenetworks.com/extreme-hardwaresoftware-compatibility-recommendation-matrices/software-release-recommendations/>.

For instructions about upgrading ExtremeXOS software, see "Software Upgrade and Boot Options" in the [ExtremeXOS 22.7 User Guide](#).



Beginning with ExtremeXOS 12.1, an ExtremeXOS core image (.xos file) must be downloaded and installed on the alternate (non-active) partition. If you try to download to an active partition, the error message `Error: Image can only be installed to the non-active partition.` appears. An ExtremeXOS modular software package (.xmod file) can still be downloaded and installed on either the active or alternate partition.

## Default ExtremeXOS® Settings

Table 3 shows the default settings for ExtremeXOS 22.7.

**Table 3: Default ExtremeXOS Settings**

ExtremeXOSFeature	ExtremeXOS 22.7 Settings
Account lockout	After 3 consecutive login failures, account is locked for 5 minutes. <sup>a</sup>
AVB	Disabled.
BGP	Disabled.
BOOTP Relay	Disabled.
CDP	Enabled.
Configuration auto save	Disabled.
Clear-flow	Disabled.
Diagnostics	Admin-level privileges required to show diagnostics. <sup>a</sup>
DHCP	Disabled.
IPFIX	Disabled.
EAPS	Disabled.
EDP	Enabled.
ELRP	Disabled.
ESRP	Disabled.
Extended Edge Switching (VPEX)	Disabled.
Extended Edge Switching ring re-balancing	Disabled.
Identity Management	Disabled.
IGMP	Enabled, set to IGMPv2 compatibility mode.
IGMP Snooping	Enabled.
IP Route Compression	Enabled.
ISIS	Disabled.
Log	Admin level privileges required to show log. <sup>a</sup>
Logging memory buffer	Generate an event when the logging memory buffer exceeds 90% of capacity. <sup>a</sup>

<sup>a</sup> If you choose enhanced security mode when initially setting up the switch or after running `unconfigure switch all`.

**Table 3: Default ExtremeXOS Settings (continued)**

ExtremeXOSFeature	ExtremeXOS 22.7 Settings
MLD	Disabled.
MLD Snooping	Disabled.
MPLS	Disabled.
MSRP	Disabled.
MSTP	Enabled.
NetLogin	All types of authentication are disabled.
NTP	Disabled.
ONEPolicy	Disabled.
OpenFlow	Disabled.
OSPF	Disabled.
OVSDB	Disabled.
Passwords	Plain text password entry not allowed. <sup>a</sup>
PIM	Disabled.
PIM Snooping	Disabled.
RADIUS	Disabled for both switch management and network login.
RIP	Disabled.
RMON	Disabled. However, even in the disabled state, the switch responds to RMON queries and sets for alarms and events.
sFlow	Disabled.
SNMP server	Disabled. <sup>a</sup>
SSH	Disabled.
Stacking	Disabled.
STP	Enabled.
Syslog	Disabled.
TACACS	Disabled.
Telnet	Disabled. <sup>a</sup>
VPLS	All newly created VPLS instances are enabled.
Watchdog	Enabled.
Web HTTP server	Disabled. <sup>a</sup>

## New and Corrected Features in ExtremeXOS 22.7

This section lists the new and corrected features supported in the 22.7 software:

## Extended Edge Switching Ring Topology

The Extended Edge Switching ring topology feature allows two Extended Edge Switching (VPEX) cascades to be joined together to form a control plane ring. When a link breaks or a bridge port extender (BPE) otherwise leaves, the remaining BPEs reform two data plane cascades, thus keeping both control and data plane connectivity to the controlling bridge (CB) alive. This provides redundant connection from any BPE in the ring to the CB. This is especially useful in a wiring closet application where the BPEs are located in the closet, and the CB is located more centrally, and there are only two links wired from the CB to the closet. Each cascade is formed from the control plane perspective only; the data plane acts as if there were two cascades consisting of BPEs that are each present in only one cascade.

### Supported Platforms

**CBs:** Summit X670-G2 and ExtremeSwitching X690, X590 series switches.

**BPEs:** V400-24t-10GE2, V400-24p-10GE2, V400-48t-10GE4, V400-48p-10GE4 virtual port extenders.

### Limitations

- A maximum of 8 BPEs per ring is supported.
- A ring can be formed from exactly one or two cascades. A cascade (or any part thereof) can be a part of at only one ring.
- Three-way MLAG is not supported.

### New CLI Commands

```
configure vpex mlag-id mlag_id peer peer_name slot slot_num
```

```
unconfigure vpex [ports port_list | mlag-id] mlag_id slot
```

```
show vpex topology { port port_num } {summary | detail}
```

```
configure vpex ring rebalancing [auto | off]
```

### Changed CLI Commands

The following show commands now display Extended Edge Switching ring topology information:

```
show vpex bpe
```

```
show vpex ports ports_list
```

```
show {port port_number} sharing {detail}
```

```
show vpex
```

## Command Line Interface (CLI) History Expansion

The history expansion character '!' can be used to specify a command from the history that is substituted into the command line. All occurrences of the form “!n:w” in the command are replaced with the w'th word from the n'th line in the command history. Specification of the word is optional.

*Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

*New CLI Commands*

```
enable cli history expansion {session | permanent}
```

```
disable cli history expansion {session | permanent}
```

*Changed CLI Commands*

The following show command now shows the CLI history expansion status:

```
show management
```

## New Access Control List (ACL) Match Condition

ExtremeXOS 22.7 introduces a new Access Control List (ACL) match condition:

```
packet-lookup-status status1 {,status2 {,status3}}
```

This new ACL match condition matches if the packet's lookup status satisfies all the statuses listed in the match condition. The lookup status value can be one of the following:

- destination-mac-hit or destination-mac-miss
- source-mac-miss or source-mac-hit or source-mac-move
- source-mac-static

*Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

## Enabling/Disabling Ports for a Multi-switch Link Aggregation Group (MLAG) ID

ExtremeXOS 22.7 introduces a new pair of commands to enable and disable ports for a multi-switch link aggregation group (MLAG) ID.

*Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

*New CLI Commands*

```
enable ports [mlag-id mlag_id]
```

```
disable ports [mlag-id mlag_id]
```

## New Command for External Python Scripting Support

Previously, when Federal Information Processing Standards (FIPS) mode was turned off, external Python scripting support was automatically on.

ExtremeXOS 22.7 includes a new command to turn on/off external Python scripting support when FIPS mode is off.

### *Support Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *New CLI Commands*

```
configure security python [on | off]
```

### *Changed CLI Commands*

The following command now shows external Python scripting support status. Changes are underlined:

```
show security [fips-mode | python]
```

## Stacking V400 Alternative Configuration Required for Certain Fiber Cables

V400 is the default mode that sets the stack ports to 106G. V400 alternative configuration is required when using specific fiber cables. This mode sets the stack ports to 100G, enables pre-emphasis, and FEC (clause\_91).

Cables requiring Alternative Configuration include:

- QSFP28 SR4
- QSFP28 LR4
- QSFP28 CWDM4
- QSFP28 PSM4
- QxQ AOC cable - 5m
- QxQ AOC cable - 7m
- QxQ AOC cable - 10m
- QxQ AOC cable - 20m

For a complete list of supported cables, see [ExtremeSwitching and Summit Switches: Hardware Installation Guide for Switches Using ExtremeXOS 21.1 or Later](#).

### *Supported Platforms*

ExtremeSwitching X590, X690, X870 series switches.

### *Changed CLI Commands*

Changes are underlined.

```
configure stacking-support stack-port [stack-ports | all] selection
[native {V80 | V160} | V320 | V400 {alternative-configuration} | help] |
alternate]
```

## New Command for Copying an Image from the Active to the Inactive Partition

To avoid the need to download an image multiple times in order to install it onto both partitions of a switch, a new command is introduced in ExtremeXOS 22.7. This command copies the image (.xos image and all .xmod and .lst files) on the active partition to the inactive partition.

### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *New CLI Commands*

```
install image inactive {slot slot}
```

## New Count Filter for Show Commands

ExtremeXOS 22.7 introduces a new count filter for show commands. This filter adds the ability to display the number of lines of output from a show command with or without actual filtering.

### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *Changed CLI Commands*

Changes are underlined.

```
show specific show command syntax | [ [ begin | exclude | grep | include ] { ignore-case } regex { | count } | count ]
```

## ONEPolicy Classification Rule Precedence Re-ordering

Starting with ExtremeXOS 22.7, you can modify the default precedence of ONEPolicy profile rules. You can configure the precedence for the rule types within each rule group. The rule groups currently supported are MAC, IPv6, IPv4, and Layer2.

### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *Changed CLI Commands*

Changes are underlined.

```
configure policy profile profile_index {name name} {pvid pvid} {pvid-status pvid_status} {cos cos} {cos-status cos_status} {egress-vlans egress_vlan_list} {forbidden-vlans forbidden_vlans} {untagged-vlans untagged_vlans} {append | clear} {tci-overwrite tci_overwrite} {precedence [precedence | default]} {auth-override auth_override} {nsi [nsi | none]} {web-redirect web_redir_index}
```

## Ability to Rename Existing MLAG Peers

You can now rename an existing MLAG peer without having to delete, and then re-create it.

### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *New CLI Commands*

```
configure { mlag peer } peer_name name new_peer_name
```

## Convergence End Point (CEP) Added to Network Login Authentication Protocol Order Command

In ExtremeXOS 22.7, Convergence End Point (CEP) has been added to the command that configures the order of the Network Login (NetLogin) port's authentication protocols.

### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *Changed CLI Commands*

Changes are underlined.

```
configure netlogin authentication protocol-order [[dot1x [web-based | mac | cep]] | [mac [dot1x | web-based | cep]] | [web-based [dot1x | mac | cep]] | [cep [dot1x | web-based | mac]]]
```

## Ability to Configure Ethernet Ring Protection Switching (ERPS) Ring ID

ExtremeXOS 22.7 now has the ability to configure an Ethernet Ring Protection Switching (ERPS) ring ID when creating the ring.

### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

### *Changed CLI Commands*

Changes are underlined.

```
create erps ring-name {ring-id ring_id}
```

## Ability to Send Router Advertisements Only with Virtual Router Redundancy Protocol's (VRRP) Virtual Link Local Address (LLA)

In Virtual Router Redundancy Protocol (VRRP) IPv6 environment, previously ExtremeXOS sent the router advertisements (RA) using link local address (LLA) configured on VLAN interface from VRRP

master, backup, and router advertisements having VRRP's link local address from VRRP master. This caused the host to have three default gateways (host gets gateway address from RA). This in turn could cause the host to use the VLAN link local IP address of the VRRP Backup as the gateway, and thus the host would experience connectivity issues.

This new feature introduces a command to avoid this problem by allowing you to specify sending the RAs having only the VRRP's LLA from the VRRP master.

#### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

#### *New CLI Commands*

```
configure {vlan} vlan_name router-discovery {ipv6} vrrp-lla-only on_off
```

#### *Changed CLI Commands*

The following command now shows the status of how router advertisements are sent:

```
show router-discovery {ipv6} {vlan vlan_name}
```

## CLI History Lookup

You can now find and re-execute CLI commands from the history.

To find a previously entered command:

- 1 Press **CTRL + R**. The prompt changes to `reverse-i-search`.
- 2 Start typing any part of the desired command. The CLI shows matching commands from the history. If there are multiple matches, press **CTRL + R** again to view additional matches.
- 3 To use the recovered command:
  - To execute the command with no changes, press **ENTER**.
  - To modify the command at the searched word, press **ESC** to place the command in the prompt with the cursor on the searched word.
  - To modify the command from the end of the command, press **CTRL + E** to place the command in the prompt with the cursor at the end of the command.

#### *Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

## New Command to Configure Ethernet Ring Protection Switching (ERPS) Control MAC Address

There is a new command that configures control MAC (either default or auto) on a particular Ethernet Ring Protection Switching (ERPS) ring instance.



*Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

*New CLI Commands*

```
configure erps ring-name control-mac [auto | default]
```

## New Command to Prevent Extended Edge Automatic Configuration from Running

ExtremeXOS now provides a command to prevent Extended Edge automatic configuration (Zero Touch Provisioning (ZTP)) from running.

Automatic configuration occurs when an unconfigured controlling bridge (CB) (new, out of the shipping box, or manually unconfigured) is rebooted with attached bridge port extenders (BPEs).

*Supported Platforms*

Summit X670-G2 and ExtremeSwitching X690, X590 series switches.

*New CLI Commands*

```
terminate vpex ztp
```

*Changed CLI Commands*

The following show command now shows ZTP status:

```
show vpex
```

## Ping Success Added for Policy-Based Redirection

ExtremeXOS now has a ping success count option for checking if a nexthop is up for policy-based redirection.

*Supported Platforms*

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X590, X620, X690, X870 series switches.

*Changed CLI Commands*

Changes are underlined>.

```
configure flow-redirect flow_redirect_name nexthop ip_address ping  
health-check interval seconds miss number {success successes}
```

The following show command shows ping success information:

```
show flow-redirect {flow_redirect_name}
```

## Extreme Loop Recovery Protocol (ELRP) MAC Address Change

The Extreme Loop Recovery Protocol (ELRP) source MAC address has changed from "00:e0:2b:00:00:01" to "0e:Switch-MAC" starting with ExtremeXOS 22.5.

## Updating the Programmable Logic Firmware on the Summit X440-G2 and ExtremeSwitching X620 Series Switches

You can update the programmable logic firmware components (FPGA and PLD) on the ExtremeSwitching X440-G2 and X620 series switches. Starting with ExtremeXOS 22.3, a firmware update was made available for the ExtremeSwitching X440-G2 and X620 series switches that provides the following enhancements:

- Enhanced robustness of interface-to-system LEDs and power supply status signals
- Added support for "Repeated Start" mechanism to improve interface to a subset of optics that require it
- Additional power monitoring (ExtremeSwitching X620 only)

However, because of manufacturing cut-in times, some switches may have older firmware. If the switch requires an update, the following messages appear during system start-up:

```
<Warn:HAL.Card.Warning> Switch PLD1 firmware is out of date, do 'install firmware' to update.
<Warn:HAL.Card.Warning> Switch FPGA firmware is out of date, do 'install firmware' to update.
```

To view the current firmware versions, use the command `show version detail`. The following shows sample output from this command with the firmware version in bold:

```
# show version detail
Switch      : 800624-00-01 1516G-01246 Rev 1.0 BootROM: 1.0.1.7   IMG: 22.3.0.35
             FPGA: 1.1.42.0 PLD1: 1.0.10.0
...
```

The new firmware versions included in ExtremeXOS 22.3 and later are FPGA 1.1.44.0 and PLD 2.0.14.0.

Use the `install firmware` command to update the firmware. Running this command requires a reboot of the switch, which can be performed at any time after the command has completed. For more information about this command, see the [ExtremeXOS 22.7 Command Reference Guide](#).

## Extreme Hardware/Software Compatibility and Recommendation Matrices

The [Extreme Hardware/Software Compatibility and Recommendation Matrices](#) provide information about the minimum version of ExtremeXOS software required to support switches, as well as pluggable transceivers and cables.

This guide also provides information about which optics are supported on which hardware platforms, and the minimum software version required.

The latest version of this and other ExtremeXOS guides are at: [www.extremenetworks.com/documentation/](http://www.extremenetworks.com/documentation/).

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## Compatibility with Extreme Management Center (Formerly NetSight)

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ExtremeXOS 22.7 is compatible with the version of Extreme Management Center as shown in this table:  
[http://emc.extremenetworks.com/content/common/releasenotes/extended\\_firmware\\_support.htm](http://emc.extremenetworks.com/content/common/releasenotes/extended_firmware_support.htm)

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## Supported MIBs

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The Extreme Networks management information bases (MIBs) are located at  
[www.extremenetworks.com/support/policies/mibs/](http://www.extremenetworks.com/support/policies/mibs/).

When you provide your serial number or agreement number, the MIBs are available under each release.

For detailed information on which MIBs and SNMP traps are supported, see the *Extreme Networks Proprietary MIBs* and *MIB Support Details* sections in the *ExtremeXOS 22.7 User Guide*.

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## Tested Third-Party Products

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This section lists the third-party products tested for ExtremeXOS 22.7.

### Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS

### Tested Third-Party Clients

The following third-party clients are fully tested:

- Windows 7
- Windows Vista
- Linux (IPv4 and IPv6)
- Windows XP (IPv4)

### PoE Capable VoIP Phones

The following PoE capable VoIP phones are fully tested:

- Avaya 4620
- Avaya 4620SW IP telephone
- Avaya 9620
- Avaya 4602
- Avaya 9630
- Avaya 4621SW
- Avaya 4610
- Avaya 1616

- Avaya one-X
- Cisco 7970
- Cisco 7910
- Cisco 7960
- ShoreTel ShorePhone IP 212k
- ShoreTel ShorePhone IP 560
- ShoreTel ShorePhone IP 560g
- ShoreTel ShorePhone IP 8000
- ShoreTel ShorePhone IP BB 24
- Siemens OptiPoint 410 standard-2
- Siemens OpenStage 20
- Siemens OpenStage 40
- Siemens OpenStage 60
- Siemens OpenStage 80

## Extreme Switch Security Assessment

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### DoS Attack Assessment

Tools used to assess DoS attack vulnerability:

- Network Mapper (NMAP)

### ICMP Attack Assessment

Tools used to assess ICMP attack vulnerability:

- SSPing
- Twinge
- Nuke
- WinFreeze

### Port Scan Assessment

Tools used to assess port scan assessment:

- Nessus

## Service Notifications

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To receive proactive service notifications about newly released software or technical service communications (for example, field notices, product change notices, etc.), register at:

[www.extremenetworks.com/support/service-notification-form](http://www.extremenetworks.com/support/service-notification-form)

# 2 Limits

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This chapter summarizes the supported limits in ExtremeXOS 22.7.

The limits data is grouped by license level that contains the associated features:

- [Supported Limits for Edge License](#) on page 21
- [Supported Limits for Advanced Edge License](#) on page 47
- [Supported Limits for Core License](#) on page 55

For more information about licenses, see [ExtremeXOS 22.7 Feature License Requirements](#).

The following tables summarize tested metrics for a variety of features, as measured in a per-system basis unless otherwise noted. These limits may change, but represent the current status. The contents of this table supersede any values mentioned in the ExtremeXOS books.

The scaling and performance information shown in the following tables is provided for the purpose of assisting with network design. It is recommended that network architects and administrators design and manage networks with an appropriate level of network scaling “head room.” The scaling and performance figures provided have been verified using specific network topologies using limited switch configurations. There is no guarantee that the scaling and performance figures shown are applicable to all network topologies and switch configurations and are provided as a realistic estimation only. If you experience scaling and performance characteristics that you feel are sufficiently below what has been documented, contact Extreme Networks technical support for additional assistance.

The route limits shown in the following tables for IPv4 and IPv6 routing protocols are software limits only. The actual hardware limits may be higher or lower than the software limits, based on platform. The hardware limits for specific platforms are specified as “IPv4/IPv6 routes (LPM entries in hardware)” in the following tables.

In the Extended Edge Switching architecture, Layer-2, Layer-3, and multicast packet forwarding and filtering operations take place on the controlling bridge. The controlling bridge switch and attached BPEs (V400 Virtual Port Extenders) constitute a single, extended switch system. Therefore, the Extended Edge Switching system assumes the scale and limits from the specific controlling bridge model (for example, Summit X670-G2 or ExtremeSwitching X690 and X590 series switches) in use. For applicable limits, see the following tables for the controlling bridge you are using.

## Supported Limits for Edge License

The following table shows supported limits for features in the Edge License.

**Table 4: Supported Limits for Edge License**

Metric	Product	Limit
<b>AAA (local)</b> —maximum number of admin and local user accounts.	All platforms	16
<b>Access lists (meters)</b> —maximum number of meters.	ExtremeSwitching X620, X440-G2	1,024 ingress 256 egress
	Summit X770, X670-G2, X450-G2, X460-G2	1,024 ingress 512 egress
	ExtremeSwitching X870, X690, X590	2,048 ingress 512 egress
<b>Access lists (policies)</b> —suggested maximum number of lines in a single policy file.	All platforms	300,000
<b>Access lists (policies)</b> —maximum number of rules in a single policy file. <sup>a</sup>	Summit X460-G2, X450-G2, X770, X670-G2	4,096 ingress 1,024 egress
	ExtremeSwitching X620, X440-G2	2,048 ingress 512 egress
	ExtremeSwitching X870	3,072 ingress 1,024 egress
	ExtremeSwitching X690, X590	8,192 ingress 1,024 egress
<b>Access lists (policies)</b> —maximum number of rules in a single policy file in first stage (VFP).	Summit X450-G2, X460-G2	2,048 ingress only
	Summit X670-G2, X770, ExtremeSwitching X870, X690	1,024 ingress only
	ExtremeSwitching X620, X440-G2	512 ingress only
	ExtremeSwitching X590	2,048 ingress only
<b>Access lists (slices)</b> —number of ACL slices.	Summit X460-G2, X450-G2	16 ingress 4 egress
	Summit X770, X670-G2, ExtremeSwitching X690, X590	12 ingress 4 egress
	ExtremeSwitching X440-G2, X620	8 ingress 4 egress
	ExtremeSwitching X870	4 ingress 4 egress
<b>Access lists (slices)</b> —number of ACL slices in first stage (VFP).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	4 ingress only
<b>ACL Per Port Meters</b> —number of meters supported per port.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16
<b>ACL port ranges</b>	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	32
<b>Meters Packets-Per-Second Capable</b>	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	Yes

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
AVB (audio video bridging)—maximum number of active streams.	Summit X450-G2, X460-G2, X770, and ExtremeSwitching X620, X440-G2	1,024
	Summit X670-G2	4,096
	ExtremeSwitching X590, X690, X870	N/A
BFD sessions (Software Mode)—maximum number of BFD sessions.	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X440-G2, X620, X870, X690, X590 (default timers—1 sec)	512
	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X440-G2, X620, X870, X690, X590 (minimal timers—100 msec)	10 <sup>c</sup>
BFD IPv4 sessions (Hardware Assisted)—maximum number of IPv4 BFD sessions.	Summit X460-G2, ExtremeSwitching X870, X690, X590	900 (PTP not enabled) 425 (PTP enabled) 256 (with 3 ms transmit interval)
BFD IPv6 sessions (Hardware Assisted)—maximum number of IPv6 BFD sessions.	Summit X460-G2, ExtremeSwitching X870, X690, X590	425 (PTP not enabled)
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	4,000
Connectivity fault management (CFM)—maximum number of CFM domains.  <b>Note:</b> With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	8
CFM—maximum number of CFM associations.  <b>Note:</b> With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	256
CFM—maximum number of CFM up end points.  <b>Note:</b> With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	32

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<p><b>CFM</b>—maximum number of CFM down end points.</p> <p><b>Note:</b> With Advanced Edge license or higher.</p>	<p>Summit X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590</p> <p>Summit X460-G2</p>	<p>32</p> <p>256 (non-load shared ports) 32 (load shared ports)</p>
<p><b>CFM</b>—maximum number of CFM remote end points per up/down end point.</p> <p><b>Note:</b> With Advanced Edge license or higher.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590</p>	2,000
<p><b>CFM</b>—maximum number of dotlag ports.</p> <p><b>Note:</b> With Advanced Edge license or higher.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590</p>	128
<p><b>CFM</b>—maximum number of CFM segments.</p> <p><b>Note:</b> With Advanced Edge license or higher.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590</p>	1,000
<p><b>CFM</b>—maximum number of MIPs.</p> <p><b>Note:</b> With Advanced Edge license or higher.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590</p>	256
<p><b>CLEAR-Flow</b>—total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs.</p>	<p>Summit X460-G2, X770, X670-G2, X450-G2</p> <p>ExtremeSwitching X440-G2, X620</p> <p>ExtremeSwitching X870</p> <p>ExtremeSwitching X690, X590</p>	<p>4,094</p> <p>1,024</p> <p>3,072</p> <p>8,192</p>
<p><b>Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)</b>—maximum number of DCBX application TLVs.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590</p>	8
<p><b>DHCPv6 Prefix Delegation Snooping</b>—Maximum number of DHCPv6 prefix delegation snooped entries.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590</p>	<p>256 (with Underlying Protocol Ripng)</p> <p>128 (with Underlying protocol OSPFv3)</p> <p>1,024 (with static routes)</p>
<p><b>DHCP snooping entries</b>—maximum number of DHCP snooping entries.</p>	<p>Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590</p>	2,048



**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<p><b>Dynamic ACLs</b>—maximum number of ACLs processed per second.</p> <p><b>Note:</b> Limits are load dependent.</p>	<p>Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590</p> <p>with 50 DACLS with 500 DACLS</p>	<p>10 5</p>
<p><b>EAPS domains</b>—maximum number of EAPS domains.</p> <p><b>Note:</b> An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains.</p> <p><b>Note:</b> You can increase the number of domains by upgrading to the Advanced Edge license.</p>	<p>Summit X670-G2, X450-G2, X460-G2, X770, and ExtremeSwitching X440-G2, X620, X870, X690, X590</p>	<p>4</p>
<p><b>EAPSV1 protected VLANs</b>—maximum number of protected VLANs.</p>	<p>Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2</p> <p>ExtremeSwitching X870, X690, X590</p>	<p>1,000 2,000</p>
<p><b>ERPS domains</b>—maximum number of ERPS domains with or without CFM configured.</p> <p><b>Note:</b> You can increase the number of domains by upgrading to the Advanced Edge license.</p>	<p>Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590</p>	<p>4</p>
<p><b>ERPSV1 protected VLANs</b>—maximum number of protected VLANs.</p>	<p>ExtremeSwitching X870, X690, X590</p> <p>Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X620, X440-G2</p>	<p>2,000 1,000</p>
<p><b>ERPSV2 protected VLANs</b>—maximum number of protected VLANs.</p>	<p>Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590</p> <p>Summit X770, ExtremeSwitching X620, X440-G2</p>	<p>2,000 500</p>
<p><b>ELSM (vlan-ports)</b>—maximum number of VLAN ports.</p>	<p>Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690, X590</p> <p>ExtremeSwitching X440-G2</p>	<p>5,000 4,000</p>
<p><b>Extended Edge Switching maximum BPEs</b>—maximum number of attached bridge port extenders (BPEs).</p>	<p>Summit X670-G2, ExtremeSwitching X690, X590</p>	<p>48</p>
<p><b>Extended Edge Switching maximum BPEs per ring</b>—maximum number of attached bridge port extenders (BPEs) per ring.</p>	<p>Summit X670-G2, ExtremeSwitching X690, X590</p>	<p>8</p>
<p><b>Extended Edge Switching maximum cascade ports</b>—maximum number of upstream ports on bridge port extenders (BPEs).</p>	<p>Summit X670-G2, ExtremeSwitching X690, X590</p>	<p>2 on V400-24 models 4 on V400-48 models</p>

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Extended Edge Switching maximum tiers</b> —maximum number of cascade levels (tiers) of bridge port extenders (BPEs).	Summit X670-G2, ExtremeSwitching X690, X590	4
<b>Extended Edge Switching VLAN+ port memberships</b> —maximum number of VLAN+ (extended) port memberships.	Summit X670-G2, ExtremeSwitching X690, X590	12,000 in hash mode (default) 131,000 in port-group mode
<b>Forwarding rate</b> —maximum L3 software forwarding rate.	ExtremeSwitching X690, X590 ExtremeSwitching X870 Summit X450-G2 Summit X460-G2 ExtremeSwitching X620 Summit X670-G2 Summit X770 ExtremeSwitching X440-G2	30,000 pps 32,000 pps 16,000 pps 17,000 pps 10,000 pps 15,000 pps 6,500 pps 9,000 pps
<b>FDB (unicast blackhole entries)</b> —maximum number of unicast blackhole FDB entries.	Summit X460-G2 Summit X770, X670-G2 Summit X450-G2 ExtremeSwitching X620, X440-G2 ExtremeSwitching X870 ExtremeSwitching X690, X590	49,152 <sup>f</sup> 294,912 <sup>f</sup> 34,816 <sup>f</sup> 16,384 <sup>f</sup> 139,264 <sup>f</sup> 278,528 <sup>f</sup>
<b>FDB (multicast blackhole entries)</b> —maximum number of multicast blackhole FDB entries.	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620 Summit X770, X670-G2, ExtremeSwitching X870, X690, X590	1,024 4,096
<b>FDB (maximum L2 entries)</b> —maximum number of MAC addresses.	Summit X460-G2 Summit X770, X670-G2 Summit X450-G2 ExtremeSwitching X620, X440-G2 ExtremeSwitching X870 ExtremeSwitching X690, X590	98,300 <sup>g</sup> 294,912 <sup>g</sup> 68,000 <sup>g</sup> 16,384 139,264 <sup>g</sup> 278,528 <sup>g</sup>
<b>FDB (Maximum L2 entries)</b> —maximum number of multicast FDB entries.	Summit X770, X670-G2, ExtremeSwitching X870, X690, X590 Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	4,096 1,024
<b>Identity management</b> —maximum number of Blacklist entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	512

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Identity management</b> —maximum number of Whitelist entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	512
<b>Identity management</b> —maximum number of roles that can be created.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	64
<b>Identity management</b> —maximum role hierarchy depth allowed.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	5
<b>Identity management</b> —maximum number of attribute value pairs in a role match criteria.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16
<b>Identity management</b> —maximum of child roles for a role.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>Identity management</b> —maximum number of policies/dynamic ACLs that can be configured per role.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>Identity management</b> —maximum number of LDAP servers that can be configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>Identity management</b> —maximum number of Kerberos servers that can be configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	20
<b>Identity management</b> —maximum database memory-size.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	512
<b>Identity management</b> —recommended number of identities per switch. <b>Note:</b> Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	100
<b>Identity management</b> —recommended number of ACL entries per identity. <b>Note:</b> Number of ACLs per identity based on system ACL limitation.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	20
<b>Identity management</b> —maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	500
<b>IGMP snooping per VLAN filters</b> —maximum number of VLANs supported in per-VLAN IGMP snooping mode.	Summit X460-G2, ExtremeSwitching X870	1,500
	Summit X450-G2	2,048
	Summit X770, X670-G2	2,000
	ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X690, X590	4,000

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>IGMPv1/v2 SSM-map entries</b> —maximum number of IGMPv1/v2 SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	500
<b>IGMPv1/v2 SSM-map entries</b> —maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	50
<b>IGMPv2 subscriber</b> —maximum number of IGMPv2 subscribers per port. <sup>n</sup>	Summit X770, X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690, X590	4,000
<b>IGMPv2 subscriber</b> —maximum number of IGMPv2 subscribers per switch. <sup>n</sup>	Summit X770, X670-G2	30,000
	Summit X460-G2, X450-G2	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690, X590	45,000
<b>IGMPv3 maximum source per group</b> —maximum number of source addresses per group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	250
<b>IGMPv3 subscriber</b> —maximum number of IGMPv3 subscribers per port. <sup>n</sup>	Summit X770, X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690, X590	4,000
<b>IGMPv3 subscriber</b> —maximum number of IGMPv3 subscribers per switch. <sup>n</sup>	Summit X460-G2, X450-G2	20,000
	Summit X770, X670-G2	30,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690, X590	45,000
<b>IP ARP entries in software</b> —maximum number of IP ARP entries in software.  <b>Note:</b> May be limited by hardware capacity of FDB (maximum L2 entries).	Summit X670-G2, X770	131,072 (up to) <sup>h</sup>
	Summit X460-G2	57,344 (up to) <sup>h</sup>
	Summit X450-G2	47,000 (up to) <sup>h</sup>
	ExtremeSwitching X440-G2, X620	20,480
	ExtremeSwitching X870	94,206 (up to) <sup>h</sup>
	ExtremeSwitching X690, X590	157,694 (up to) <sup>h</sup>

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
IPv4 ARP entries in hardware with <b>minimum LPM routes</b> —maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. Assumes number of IP route reserved entries is 100 or less.	ExtremeSwitching X870	74,000 (up to) <sup>h</sup>
	Summit X460-G2	50,000 (up to) <sup>h</sup>
	Summit X770, X670-G2	108,000 (up to) <sup>h</sup>
	Summit X450-G2	39,000 (up to) <sup>h</sup>
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590	119,000 (up to) <sup>h</sup>
IPv4 ARP entries in hardware with <b>maximum LPM routes</b> —maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is “maximum.”	ExtremeSwitching X870	64,000 (up to) <sup>h</sup>
	Summit X460-G2	43,000 (up to) <sup>h</sup>
	Summit X770, X670-G2	98,000 (up to) <sup>h</sup>
	Summit X450-G2	29,000 (up to) <sup>h</sup>
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590	109,000 (up to) <sup>h</sup>
IP flow information export (IPFIX)—number of simultaneous flows.	Summit X460-G2	2,048 ingress 2,048 egress
	Summit X450-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	N/A
IPv4 remote hosts in hardware with <b>zero LPM routes</b> —maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less.	ExtremeSwitching X870	120,000 (up to) <sup>h</sup>
	Summit X460-G2	73,000 <sup>h</sup>
	Summit X770, X670-G2	176,000 (up to) <sup>h</sup>
	Summit X450-G2	61,000 (up to) <sup>h</sup>
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X690, X590	216,000 (up to) <sup>h</sup>
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	Summit X460-G2, X450-G2, X440-G2, X620	25,000
	Summit X670-G2, ExtremeSwitching X690, X870, X590	131,000
	Summit X770	100,000

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>IPv4 routes (LPM entries in hardware)</b> — number of IPv4 routes in hardware.	Summit X460-G2	12,000
	Summit X450-G2	16,000
	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	131,000 <sup>a</sup>
	ExtremeSwitching X620, X440-G2	480
<b>IPv6 6in4 tunnel</b> —maximum number of IPv6 6in4 tunnels.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	255
	ExtremeSwitching X440-G2, X620	N/A
<b>IPv6 6to4 tunnel</b> —maximum number of IPv6 6to4 tunnels.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	1 (per virtual router)
	ExtremeSwitching X440-G2, X620	N/A
<b>IPv6 addresses on an interface</b> — maximum number of IPv6 addresses on an interface.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	255
<b>IPv6 addresses on a switch</b> —maximum number of IPv6 addresses on a switch.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X590	2,048
	ExtremeSwitching X620, X440-G2	510
<b>IPv6 host entries in hardware</b> — maximum number of IPv6 neighbor entries in hardware.	Summit X770, X670-G2	36,750 <sup>h</sup>
	Summit X460-G2	22,000 <sup>h</sup>
	Summit X450-G2	12,000 <sup>h</sup>
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X690, X590	24,500 <sup>h</sup>
<b>IPv6 routes in software</b> —maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	25,000
	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	65,000 <sup>a</sup>
<b>IPv6 routes (LPM entries in hardware)</b> — maximum number of IPv6 routes in hardware.	Summit X460-G2	6,000
	Summit X450-G2	8,000
	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	65,000 <sup>a</sup>
	ExtremeSwitching X620, X440-G2,	240
<b>IPv6 routes with a mask greater than 64 bits in hardware</b> —maximum number of such IPv6 LPM routes in hardware.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	8,192 <sup>r</sup>
	ExtremeSwitching X440-G2, X620	1,024
	Summit X450-G2, X460-G2	2,048

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>IPv6 route sharing in hardware</b> —route mask lengths for which ECMP is supported in hardware.	Summit X460-G2, X450-G2, and ExtremeSwitching X620	0-64 >64 single path only
	Summit X670-G2, X770, and ExtremeSwitching X690, X870, X590	0-128 <sup>r</sup>
	ExtremeSwitching X440-G2	Not supported
<b>IP router interfaces</b> —maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	Summit X460-G2, X770, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590	2,048
	ExtremeSwitching X620, X440-G2	510
<b>IP multicast static routes</b> —maximum number of permanent multicast IP routes.	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X870, X690, X590	1,024
<b>IP unicast static routes</b> —maximum number of permanent IP unicast routes.	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X870, X690, X590	1,024
	ExtremeSwitching X620, X440-G2	480
<b>IP route sharing (maximum gateways)</b> —Configurable maximum number of gateways used by equal cost multipath OSPF, BGP, IS-IS, static routes, or L2VPNs. Static routes, OSPF, and BGP are limited to 64 ECMP gateways per destination, while IS-IS is limited to 8. L2VPNs are limited to 16 LSPs per pseudowire on platforms that support 32 gateways, and 64 LSPs per pseudowire on platforms that support 64 gateways.	Summit X460-G2, X670-G2, X450-G2, X770, and ExtremeSwitching X620, X870, X690, X590	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X440-G2	N/A

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
IP route sharing (total combinations of gateway sets)—maximum number of combinations of sets of adjacent gateways used by multipath OSPF, BGP, IS-IS, or static routes.	Summit X670-G2, X770	
	if maximum gateways is 2	1,022
	if maximum gateways is 4	1,022
	if maximum gateways is 8	1,022
	if maximum gateways is 16 (default)	1,022
	if maximum gateways is 32	510
	if maximum gateways is 64	254
	Summit X460-G2, X450-G2	
	if maximum gateways is 2	1,022
	if maximum gateways is 4	1,022
	if maximum gateways is 8	510
	if maximum gateways is 16 (default)	254
if maximum gateways is 32	126	
if maximum gateways is 64	62	
ExtremeSwitching X620		
if maximum gateways is 2	126	
if maximum gateways is 4	126	
if maximum gateways is 8	126	
if maximum gateways is 16 (default)	126	
if maximum gateways is 32	62	
if maximum gateways is 64	30	
ExtremeSwitching X690, X590		
if maximum gateways is 2	4,094	
if maximum gateways is 4	4,094	
if maximum gateways is 8	2,046	
if maximum gateways is 16 (default)	1,022	
if maximum gateways is 32	510	
if maximum gateways is 64	254	
<b>Note:</b> The values here represent the maximum attainable ECMP groups of which, due to the RIOT feature, half are reserved for overlay and half for underlay routing. For more information about RIOT, see the <a href="#">ExtremeXOS 22.7 User Guide</a> .		
ExtremeSwitching X870		
if maximum gateways is 2	2,046	
if maximum gateways is 4	2,046	
if maximum gateways is 8	2,046	
if maximum gateways is 16 (default)	1,022	
if maximum gateways is 32	510	
if maximum gateways is 64	254	
ExtremeSwitching X440-G2		
	N/A	



**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>IP multinetting (secondary IP addresses)</b> —maximum number of secondary IP addresses per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	255
<b>Jumbo frames</b> —maximum size supported for jumbo frames, including the CRC.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	9,216
<b>L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch</b> —maximum number of VCCV enabled VPLS VPNs.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590 Summit X450-G2, and ExtremeSwitching X620, X440-G2	16 N/A
<b>L2 VPN: VPLS MAC addresses</b> —maximum number of MAC addresses learned by a switch.	Summit X770 Summit X670-G2, ExtremeSwitching X690, X590 Summit X460-G2 ExtremeSwitching X870 Summit X450-G2, and ExtremeSwitching X620, X440-G2	128,000 140,000 55,000 65,000 N/A
<b>L2 VPN: VPLS VPNs</b> —maximum number of VPLS virtual private networks per switch.	Summit X460-G2, X770, X670-G2, ExtremeSwitching X870, X690, X590 Summit X450-G2, and ExtremeSwitching X620, X440-G2	1,023 N/A
<b>L2 VPN: VPLS peers</b> —maximum number of VPLS peers per VPLS instance.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590 Summit X450-G2, and ExtremeSwitching X620, X440-G2	64 N/A
<b>L2 VPN: LDP pseudowires</b> —maximum number of pseudowires per switch.	Summit X770, X670-G2, X460-G2, and ExtremeSwitching X870, X690, X590 Summit X450-G2, and ExtremeSwitching X620, X440-G2	7,000 N/A
<b>L2 VPN: static pseudowires</b> —maximum number of static pseudowires per switch.	Summit X670-G2, X460-G2, X770, ExtremeSwitching X870, X690, X590 Summit X450-G2, and ExtremeSwitching X620, X440-G2	7,000 N/A
<b>L2 VPN: Virtual Private Wire Service (VPWS) VPNs</b> —maximum number of virtual private networks per switch.	Summit X670-G2, ExtremeSwitching X870, X690, X590 Summit X460-G2 Summit X770 Summit X450-G2, and ExtremeSwitching X620, X440-G2	4,090 1,023 4,000 N/A

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Layer-2 IPMC forwarding caches</b> —(IGMP/MLD/PIM snooping) in mac-vlan mode.  <b>Note:</b> <ul style="list-style-type: none"> <li>The internal lookup table configuration used is "l2-and-l3".</li> <li>IPv6 and IPv4 L2 IPMC scaling is the same for this mode.</li> <li>Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are same.</li> </ul>	Summit X770, X670-G2	73,000
	Summit X460-G2	24,000
	Summit X450-G2	14,000
	ExtremeSwitching X620, X440-G2	5,000
	ExtremeSwitching X870	36,000
	ExtremeSwitching X690, X590	67,000
<b>Layer-3 IPv4 Multicast</b> —maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled).  <b>Note:</b> <ul style="list-style-type: none"> <li>Limit value same for MVR senders, PIM Snooping entries, PIM SSM cache, IGMP senders, PIM cache.</li> <li>The internal lookup table configuration used is "more l3-and-ipmc".</li> <li>Assumes source-group-vlan mode as look up key.</li> <li>Layer 3 IPMC cache limit in mixed mode also has the same value.</li> </ul>	Summit X460-G2	26,000
	Summit X450-G2	21,000
	Summit X770, X670-G2	77,500
	ExtremeSwitching X620, X440-G2	1,500
	ExtremeSwitching X870	52,000
	ExtremeSwitching X690, X590	93,000
<b>Layer-3 IPv6 Multicast</b> —maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled).  <b>Note:</b> <ul style="list-style-type: none"> <li>Limit value same for MLD sender per switch, PIM IPv6 cache.</li> <li>The internal lookup table configuration used is "more l3-and-ipmc".</li> <li>Assumes source-group-vlan mode as look up key.</li> </ul>	Summit X770, X670-G2	30,000
	Summit X460-G2	14,000
	Summit X450-G2	10,000
	ExtremeSwitching X620, X440-G2	700
	ExtremeSwitching X870	18,000
	ExtremeSwitching X690, X590	48,000

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<p><b>Load sharing</b>—maximum number of load sharing groups.</p> <p><b>Note:</b> The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.</p>	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	128
<b>Load sharing</b> —maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2	8
	For standalone: Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X590	32
	For stacked: Summit X770, X670-G2, X460-G2, X450-G2, X670-G2, and ExtremeSwitching X870, X690, X590	64
<b>Logged messages</b> —maximum number of messages logged locally on the system.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	20,000
<b>MAC-based security</b> —maximum number of MAC-based security policies.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1,024
<b>MAC Locking</b> —Maximum number of MAC locking stations that can be learned on a port.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
<b>Meters</b> —maximum number of meters supported.	Summit X460-G2, X450-G2, X670-G2, X770, ExtremeSwitching X440-G2, X620, X870, X690, X590	2,048

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
Maximum mirroring instances	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590  <b>Note:</b> Only two or four mirroring instances will be active at a time, depending on the mirroring filter added to it. There are four hardware resource slots. Each single instance uses one such slot, while each ingress plus egress instance uses two slots. So this allows you to use a total of four slots, while there are no more than two egress instances. The maximum possible combination for mirroring instances:  1 4 ingress 2 3 ingress + 1 egress 3 2 ingress + 2 egress 4 2 (ingress + egress) 5 1 (ingress + egress) + 2 ingress 6 1 (ingress + egress) + 1 egress + 1 ingress	16 (including default mirroring instance)
	ExtremeSwitching X620, X440-G2  <b>Note:</b> For stacks containing X620 or X440-G2, maximum supported egress mirror instances is 1.	1 (egress)
<b>Mirroring (filters)</b> —maximum number of mirroring filters.  <b>Note:</b> This is the number of filters across all the active mirroring instances.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	128
<b>Mirroring, one-to-many (filters)</b> —maximum number of one-to-many mirroring filters.  <b>Note:</b> This is the number of filters across all the active mirroring instances.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	128
<b>Mirroring, one-to-many (monitor port)</b> —maximum number of one-to-many monitor ports.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
MLAG ports—maximum number of MLAG ports allowed.	Summit X670-G2, ExtremeSwitching X690	71
	ExtremeSwitching X440-G2, Summit X450-G2	51
	Summit X460-G2	53
	Summit X770	103
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X590	35
MLAG peers—maximum number of MLAG peers allowed.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	2
MPLS RSVP-TE interfaces—maximum number of interfaces.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	32
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	Summit X460-G2, X670-G2, X770	2,000
	ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE paths—maximum number of paths.	Summit X460-G2, X770	1,000
	Summit X670-G2, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	Summit X460-G2, X770	1,000
	Summit X670-G2, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	64
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	Summit X770	64
	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690	128
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	Summit X460-G2	50
	Summit X770, X670-G2, ExtremeSwitching X870, X690	64
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	2,048
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	Summit X770	64
	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690	128
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch.	Summit X670-G2, X460-G2, X770, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS static egress LSPs—maximum number of static egress LSPs.	Summit X460-G2	7,116
	Summit X770, ExtremeSwitching X870, X690	8,000
	Summit X670-G2	15,308
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS static ingress LSPs—maximum number of static ingress LSPs.	Summit X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X770, X670-G2	2,048
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS static transit LSPs—maximum number of static transit LSPs	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Multicast listener discovery (MLD) snooping per-VLAN filters</b> —maximum number of VLANs supported in per-VLAN MLD snooping mode.	Summit X460-G2, X770, X670-G2, ExtremeSwitching X870	1,200
	Summit X450-G2	512
	ExtremeSwitching X620, X440-G2	600
	ExtremeSwitching X690, X590	1,500
<b>Multicast listener discovery (MLD)v1 subscribers</b> —maximum number of MLDv1 subscribers per port. <sup>†</sup>	Summit X770, X670-G2, X450-G2, X460-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590	4,000
<b>Multicast listener discovery (MLD)v1 subscribers</b> —maximum number of MLDv1 subscribers per switch. <sup>†</sup>	Summit X460-G2, X450-G2, ExtremeSwitching X620, X440-G2	10,000
	Summit X770, X670-G2	30,000
	ExtremeSwitching X870, X690, X590	45,000
<b>Multicast listener discovery (MLD)v2 subscribers</b> —maximum number of MLDv2 subscribers per port. <sup>†</sup>	Summit X770, X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590	4,000
<b>Multicast listener discovery (MLD)v2 subscribers</b> —maximum number of MLDv2 subscribers per switch. <sup>†</sup>	Summit X770, X670-G2	30,000
	Summit X460-G2, X450-G2, ExtremeSwitching X620, X440-G2	10,000
	ExtremeSwitching X870, X690, X590	45,000
<b>Multicast listener discovery (MLD)v2 maximum source per group</b> —maximum number of source addresses per group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	200
<b>Multicast listener discovery (MLD) SSM-map entries</b> —maximum number of MLD SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	500
	ExtremeSwitching X440-G2, X620	50
<b>Multicast listener discovery (MLD) SSM-MAP entries</b> —maximum number of sources per group in MLD SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	50
<b>Network Login</b> —maximum number of clients being authenticated on MAC-based VLAN enabled ports.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1,024
<b>Network Login</b> —maximum number of clients being authenticated with policy mode enabled with TC1 overwrite enabled.	Summit X450-G2, X460-G2, ExtremeSwitching X590	1,024
	Summit X670-G2, X770, ExtremeSwitching X870, X690	512
	ExtremeSwitching X620, X440-G2	256

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Network Login</b> —maximum number of dynamic VLANs.	Summit X460-G2, X450-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	2,000
	ExtremeSwitching X440-G2, X620	1,024
<b>Network Login VLAN VSAs</b> —maximum number of VLANs a client can be authenticated on at any given time.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	10
<b>Network Service Identifiers (NSI)/ VLAN mappings</b> —maximum number of VLANs to NSI mappings.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	94
<b>Node Alias</b> —maximum number of entries per slot.	Summit X450-G2, X460-G2, X670-G2, X770 and ExtremeSwitching X620, X440-G2, X870, X690, X590	8,192
<b>ONEPolicy Roles/Profiles</b> —maximum number of policy roles/profiles.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	63
<b>ONEPolicy Rules per Role/Profile</b> —maximum number of rules per role/policy.	Summit X450-G2, X460-G2	IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256
	Summit X670-G2, X770, ExtremeSwitching X870	IPv6 Rules: 256 L2 Rules: 184 MAC Rules: 256 IPv4 Rules: 256
	ExtremeSwitching X620, X440-G2	IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch)
	ExtremeSwitching X690, X590	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440
<b>ONEPolicy Authenticated Users per Switch</b> —maximum number of authenticated users per port only with TCI-Overwrite enabled.	Summit X450-G2, X460-G2, and ExtremeSwitching X590	1,024
	Summit X670-G2, X770, ExtremeSwitching X690, X870	512
	ExtremeSwitching X620, X440-G2	256
	Stacking	Depends on the stack nodes.



**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>ONEPolicy Authenticated Users per Switch</b> —maximum number of authenticated users per switch with TCI-Overwrite disabled.  <b>Note:</b> The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X690, X590	24,576
	Summit X670-G2, X460-G2, ExtremeSwitching X870	12,288
	Summit X770, X450-G2	6,144
	ExtremeSwitching X620, X440-G2	1,536
	Stacking	1,536–65,534
<b>ONEPolicy Authenticated Users per Port per Switch</b> — maximum number of authenticated users per port per switch with TCI overwrite disabled.  <b>Note:</b> The maximum values assume 75% utilization of VLAN-XLATE hash table.	Summit X450-G2, X770	6,144
	Summit 460-G2, X670-G2, and ExtremeSwitching X870	12,288
	ExtremeSwitching X690, X590	24,576
	ExtremeSwitching X440-G2, X620	1,536
<b>ONEPolicy Authenticated Users per Port per Switch</b> — maximum number of authenticated users per port with only with TCI-Overwrite enabled.	Summit X450-G2, X460-G2, ExtremeSwitching X590	1,024
	Summit X670-G2, X770, ExtremeSwitching X870, X690	512
	ExtremeSwitching X620, X440-G2	256
<b>ONEPolicy Permit/Deny Traffic Classification Rules Types</b> —total maximum number of unique permit/deny traffic classification rules types (system/stack).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X690, X590	1,976
<b>ONEPolicy Permit/Deny Traffic Classification Rules Types</b> —maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590	512
<b>ONEPolicy Permit/Deny Traffic Classification Rules Types</b> —maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590	512
<b>ONEPolicy Permit/Deny Traffic Classification Rules Types</b> —maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X620, X440-G2, X870	256
	ExtremeSwitching X690, X590	512

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>ONEPolicy Permit/Deny Traffic Classification Rules Types</b> —maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X690, X590	440
<b>Policy-based routing (PBR) redundancy</b> —maximum number of flow-redirects.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	256 °
<b>Policy-based routing (PBR) redundancy</b> —maximum number of next hops per each flow-direct.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	32 °
<b>Private VLANs</b> —maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	Summit X770	103
	Summit X670-G2	63
	Summit X460-G2	53
	Summit X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X690	71
<b>Private VLANs</b> —maximum number of private VLANs with an IP address on the network VLAN.  <b>Note:</b> This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	1,024
	Summit X450-G2	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
<b>Private VLANs</b> —maximum number of private VLANs in an L2-only environment.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	1,280
	Summit X450-G2	597
	ExtremeSwitching X440-G2, X620	255
<b>PTP/1588v2 Clock Ports</b>	Summit X770, X460-G2, X670-G2	32 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X620, X870, X690, X590	N/A

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
PTP/1588v2 Clock Instances	Summit X770, X670-G2, X460-G2	2 combinations: <ul style="list-style-type: none"> <li>Transparent clock + ordinary clock</li> <li>Transparent clock + boundary clock</li> </ul>
	ExtremeSwitching X440-G2, X620, X870, X690, X590	N/A
PTP/1588v2 Unicast Static Slaves	Summit X770, X670-G2, X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X620, X870, X690, X590	N/A
PTP/1588v2 Unicast Static Masters	Summit X770, X670-G2, X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X620, X870, X690, X590	N/A
<b>Route policies</b> —suggested maximum number of lines in a route policy file.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	10,000
<b>RIP Learned Routes</b> —maximum number of RIP routes supported without aggregation.	Summit X770, X670-G2, X460-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	10,000
<b>RIP interfaces on a single router</b> —recommended maximum number of RIP routed interfaces on a switch.	Summit X670-G2, X460-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590	256
	ExtremeSwitching X440-G2, X620	128
<b>RIPng learned routes</b> —maximum number of RIPng routes.	Summit X670-G2, X460-G2, X770, X450-G2, X870, X690, X590	3,000
	ExtremeSwitching X440-G2, X620	N/A
<b>Spanning Tree (maximum STPDs)</b> —maximum number of Spanning Tree Domains on port mode EMISTP.	Summit X450-G2, X770, X670-G2, X460-G2, and ExtremeSwitching X620, X870, X690, X590	64
	ExtremeSwitching X440-G2	32
<b>Note:</b> STP limits are the same for all license levels.		

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Spanning Tree PVST+</b> —maximum number of port mode PVST domains.  <b>Note:</b> For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, Summit X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	Summit X770, X670-G2, and ExtremeSwitching X620	256
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2	128
	ExtremeSwitching X870, X690, X590	384
<b>Spanning Tree</b> —maximum number of multiple spanning tree instances (MSTI) domains.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690, X590	64
	ExtremeSwitching X440-G2	32
<b>Spanning Tree</b> —maximum number of VLANs per MSTI.  <b>Note:</b> Maximum number of 10 active ports per VLAN when all 500 VLANs are in one MSTI.	Summit X770, X670-G2	500
	Summit X460-G2, X450-G2, ExtremeSwitching X620, X870, X690, X590	600
	ExtremeSwitching X440-G2	256
<b>Spanning Tree</b> —maximum number of VLANs on all MSTP instances.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X620, X870, X690, X590	1,024
	ExtremeSwitching X440-G2	512
<b>Spanning Tree (802.1d domains)</b> —maximum number of 802.1d domains per port.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1
<b>Spanning Tree (number of ports)</b> —maximum number of ports including all Spanning Tree domains.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690, X590	4,096
	ExtremeSwitching X440-G2	2,048
<b>Spanning Tree (maximum VLANs)</b> —maximum number of STP-protected VLANs (dot1d and dot1w).	Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X620, X870, X690, X590	1,024
	ExtremeSwitching X440-G2	600
<b>SSH (number of sessions)</b> —maximum number of simultaneous SSH sessions.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>Static MAC multicast FDB entries</b> —maximum number of permanent multicast MAC entries configured into the FDB.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1,024
<b>Syslog servers</b> —maximum number of simultaneous Syslog servers that are supported.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>Syslog targets</b> —maximum number of configurable Syslog targets.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16
<b>Telnet (number of sessions)</b> —maximum number of simultaneous Telnet sessions.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>Virtual routers</b> —maximum number of user-created virtual routers that can be created on a switch.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590 ExtremeSwitching X440-G2, X620	63 16 (local-only VRs)
<b>Virtual router forwarding (VRFs)</b> —maximum number of VRFs that can be created on a switch.  <b>Note:</b> * Subject to other system limitations.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590 ExtremeSwitching X440-G2, X620	960 * 16 (local-only VRFs)
<b>Virtual router protocols per VR</b> —maximum number of routing protocols per VR.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590 ExtremeSwitching X440-G2, X620	8 N/A
<b>Virtual router protocols per switch</b> —maximum number of VR protocols per switch.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590 ExtremeSwitching X440-G2, X620	64 N/A
<b>VLAN aggregation</b> —maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1,000
<b>VLANs</b> —includes all VLANs.  <b>Note:</b> ExtremeXOS supports only 4,092 user-configurable VLANs. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	4,094
<b>VLANs (Layer 2)</b> —maximum number of Layer 2 VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	4,094
<b>VLANs (Layer 3)</b> —maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	Summit X460-G2, X770, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590 ExtremeSwitching X440-G2, X620	2,048 510

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with default license.	Summit X670-G2, ExtremeSwitching X870, X690, X590	32
	ExtremeSwitching X440-G2	28
	Summit X460-G2, X770	26
	ExtremeSwitching X620	16
	Summit X450-G2	29
	Summit X460-G2	24
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	Summit X770	103
	Summit X670-G2	63
	Summit X460-G2	53
	Summit X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X870	127
	ExtremeSwitching X690	71
	ExtremeSwitching X590	31
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN.  <b>Note:</b> This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports.	Summit X770, X670-G2, ExtremeSwitching X870, X690, X590	1,024
	Summit X450-G2	512
	ExtremeSwitching X620	510
	ExtremeSwitching X440-G2	255
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	Summit X450-G2, X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	2,046
	ExtremeSwitching X440-G2, X620	255
XML requests—maximum number of XML requests per second.  <b>Note:</b> Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	10 with 100 DACLs

**Table 4: Supported Limits for Edge License (continued)**

Metric	Product	Limit
<b>XNV authentication</b> —maximum number of VMs that can be processed (combination of local and network VMs).	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	2,048
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	1,024
<b>XNV database entries</b> —maximum number of VM database entries (combination of local and network VMs).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	16,000
<b>XNV database entries</b> —maximum number of VPP database entries (combination of local and network VPPs).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	2,048
<b>XNV dynamic VLAN</b> —Maximum number of dynamic VLANs created (from VPPs /local VMs).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	2,048
<b>XNV local VPPs</b> —maximum number of XNV local VPPs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	2,048 ingress 512 egress
<b>XNV policies/dynamic ACLs</b> —maximum number of policies/dynamic ACLs that can be configured per VPP.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8 ingress 4 egress
<b>XNV network VPPs</b> —maximum number of XNV network VPPs. <sup>P</sup>	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	2,048 ingress 512 egress

## Supported Limits for Advanced Edge License

The following table shows supported limits for features in the Advanced Edge License.

**Table 5: Supported Limits for Advanced Edge License**

Metric	Product	Limit
<b>BGP auto-peering</b> —maximum number of auto-peering nodes and VTEPs.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	64
<b>BGP auto-peering attached IPv4 hosts</b> — maximum number of attached IPv4 hosts.	Summit X670-G2, X770	16,000
	ExtremeSwitching X870, X690, X590	64,000
<b>BGP auto-peering attached IPv6 hosts</b> — maximum number of attached IPv6 hosts.	Summit X670-G2, X770	254
	ExtremeSwitching X870, X690, X590	8,000

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
<b>BGP auto-peering ECMP</b> —maximum number equal cost multipath for auto-peering.  <b>Note:</b> * Subject to the limitation imposed by the number of physical ports on a switch.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	16*
<b>BGP auto-peering maximum IPv4 prefixes with ECMP</b> —Maximum number of IPv4 Network prefixes with ECMP.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	64,000
<b>BGP auto-peering maximum IPv6 prefixes with ECMP</b> —Maximum number of IPv6 Network prefixes with ECMP.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	8,000
<b>BGP auto-peering MLAG peers</b> —maximum MLAG peers per AutoBGP node.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	1
<b>BGP auto-peering VRFs</b> —maximum number of VRFs.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	64
<b>BGP auto-peering EVPN instances</b> —maximum EVPN instances.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	4,096
<b>BGP auto-peering asymmetrical routing tenant VLANs</b> —maximum number of tenant VLANs supporting asymmetric routing.	Summit X670-G2, X770, ExtremeSwitching X690, X870, X590	1,024
<b>EAPS domains</b> —maximum number of EAPS domains.  <b>Note:</b> An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains.	ExtremeSwitching X870, X690, X590  Summit X670-G2, X450-G2, X460-G2, X770  ExtremeSwitching X440-G2, X620	128  64  32
<b>EAPsv2 protected VLANs</b> —maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X620  ExtremeSwitching X870, X690, X590	500  2,000
<b>ERPS domains</b> —maximum number of ERPS domains without CFM configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	32
<b>ERPS domains</b> —maximum number of ERPS domains with CFM configured.	Summit X450-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690, X590  Summit X460-G2	16  32



**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
ERPSv1 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590	2,000
	Summit X770, ExtremeSwitching X620, X440-G2	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590	2,000
	Summit X770, ExtremeSwitching X620, X440-G2	500
ESRP groups—maximum number of ESRP groups	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X620, X870, X690, X590	32
ESRP domains—maximum number of ESRP domains.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	511
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	1
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590	64
	ExtremeSwitching X620	4
	ExtremeSwitching X440-G2	N/A
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	8
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590	10,000
	Summit X770, X670-G2, X460-G2	5,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	2,400
OSPFv2 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590	4,000
	Summit X670-G2, X460-G2, X770	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	1,000
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	4
OSPFv2 links—maximum number of links in the router LSA.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590	400
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	4
	Summit X770	419
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	Summit X450-G2, X770, X670-G2, X460-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590	4
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590	100
	Summit X770, X670-G2, X460-G2	50
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	32
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	4
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590	100
	Summit X460-G2, X670-G2, X770	16
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
OSPFv3 external routes—recommended maximum number of external routes.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	10,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	1,200
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590	4,000
	Summit X770, X670-G2, X460-G2	3,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X440-G2, X620, X590	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	Summit X450-G2, X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X440-G2, X620, X590	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	16
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OVSDB Manager Connections—Maximum number of connections to managers that can be configured (either of TCP, PTCP, SSL, or PSSSL).	Summit X770, X670-G2, ExtremeSwitching X870, X690, X590	8
	Smmit X450-G2	N/A
OVSDB Managed Switches—Maximum number of OVSDB-managed switches.	Summit X770, X670-G2, ExtremeSwitching X870, X690, X590	1
	Smmit X450-G2	N/A
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X440-G2, X620, X690, X590	4
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590	5,000
	ExtremeSwitching X440-G2, X620	1,500

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
<b>PIM IPv4 Limits</b> —maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	145
<b>PIM IPv4 Limits</b> —static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	32
<b>PIM IPv6 (maximum interfaces)</b> —maximum number of PIM active interfaces.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X440-G2, X620, X690, X590	4
<b>PIM IPv6 Limits</b> —maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	1,750
	Summit X450-G2	1,500
	ExtremeSwitching X440-G2, X620	550
<b>PIM IPv6 Limits</b> —maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	70
<b>PIM IPv6 Limits</b> —maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	3,000 (depends on policy file limits)
<b>PIM IPv6 Limits</b> —maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	64
<b>PIM IPv6 Limits</b> —maximum number of secondary address per interface.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	70
<b>PIM IPv6 Limits</b> —static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	32
<b>Port-specific VLAN tags</b> —maximum number of port-specific VLAN tags.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	1,023
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
<b>Port-specific VLAN tags</b> —maximum number of port-specific VLAN tag ports.	Summit X770, X670-G2	4,000
	Summit X460-G2, ExtremeSwitching X870, X690, X590	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
<b>VRRP (v2/v3-IPv4) (maximum instances)</b> —maximum number of VRRP instances for a single switch, with Advanced Edge license or higher.  <b>Note:</b> These limits are applicable for Fabric Routing configuration also.  <b>Note:</b> Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	<b>Normal Mode (as individual VRs):</b>  Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690, X590	511
	ExtremeSwitching X440-G2, X620	128
	<b>Scaled Mode (with groups):</b>  Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690, X590	2,048
	ExtremeSwitching X440-G2, X620	128
<b>VRRP (v3-IPv6) (maximum instances)</b> —maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. (VRRP-VRRPv3-IPv6)  <b>Note:</b> These limits are applicable for Fabric Routing configuration also.  <b>Note:</b> Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	<b>Normal Mode (as individual VRs):</b>  Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690, X590	511
	ExtremeSwitching X440-G2, X620	128
	<b>Scaled Mode (with groups):</b>  Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690, X590	2,048
	ExtremeSwitching X440-G2, X620	128
<b>VRRP (v2/v3-IPv4/IPv6) (maximum VRID)</b> —maximum number of unique VRID numbers per switch.	Summit X770, X670-G2, X460-G2, X450-G2 and ExtremeSwitching X440-G2, X620, X870, X690, X590  <b>Note:</b> With Advanced Edge license or higher.	255
<b>VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)</b> —maximum number of VRIDs per VLAN.	Summit X770, X670-G2, X460-G2, X450-G2 and ExtremeSwitching X440-G2, X620, X870, X690, X590  <b>Note:</b> With Advanced Edge license or higher.	255
<b>VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)</b> —maximum number of ping tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590  <b>Note:</b> With Advanced Edge license or higher.	8

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
<b>VRRP (maximum ping tracks)</b> —maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8 (20 centisecond or 1 second hello interval)
<b>VRRP (v3-IPv6) (maximum ping tracks)</b> —maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8 (20 centisecond or 1 second hello interval)
<b>VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)</b> —maximum number of IP route tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>VRRP (v2/v3-IPv4/IPv6)</b> —maximum number of VLAN tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690, X590	8
<b>VXLAN</b> —maximum virtual networks. <b>Note:</b> Every VPLS instance/PSTag VLAN reduces this limit by 1. <b>Note:</b> Assumption is all BUM (broadcast/unknown-unicast/multicast) FDB entries are pointing to the same set of RTEPs when all VNETs use explicit flooding. Depends on whether all VNETs use standard or explicit and the number of tenant VLAN ports.	Summit X670-G2, X770, and ExtremeSwitching X870, X690, X590  Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	2,048–4,000  N/A
<b>VXLAN</b> —maximum tenant VLANs plus port combinations <b>Note:</b> Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	Summit X670-G2, X770, and ExtremeSwitching X870, X690, X590  Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	4,096  N/A
<b>VXLAN</b> —maximum static MAC to IP bindings. <b>Note:</b> Every FDB entry configured reduces this limit by 1.	Summit X670-G2, X770, and ExtremeSwitching X870, X690, X590  Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	64,000  N/A
<b>VXLAN</b> —maximum RTEP IP addresses	Summit X670-G2, X770, and ExtremeSwitching X870, X690, X590  Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	512  N/A

**Table 5: Supported Limits for Advanced Edge License (continued)**

Metric	Product	Limit
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	Summit X670-G2, X770, and ExtremeSwitching X870, X690, X590	4,000
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	N/A

## Supported Limits for Core License

The following table shows supported limits for features in the Core License.

**Table 6: Supported Limits for Core License**

Metric	Product	Limit
BGP (aggregates)—maximum number of BGP aggregates.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	256
	Summit X450-G2	204
BGP (networks)—maximum number of BGP networks.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	1,024
	Summit X450-G2	820
BGP (peers)—maximum number of BGP peers.  <b>Note:</b> With default keepalive and hold timers.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870	128
	ExtremeSwitching X690, X590	300
	Summit X450-G2	100
BGP (peer groups)—maximum number of BGP peer groups.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	64
	Summit X450-G2	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	256
	Summit X450-G2	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	1,024
	Summit X450-G2	820
BGP multicast address-family routes —maximum number of multicast address-family routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	25,000
	Summit X450-G2	20,000

**Table 6: Supported Limits for Core License (continued)**

Metric	Product	Limit
<b>BGP (unicast address-family routes)</b> —maximum number of unicast address-family routes.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590 (at default)	25,000
	ExtremeSwitching X870, X690, X590 (with ALPM enabled)	100,000
	Summit X450-G2	20,000
<b>BGP (non-unique routes)</b> —maximum number of non-unique BGP routes.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	25,000
	Summit X450-G2	20,000
<b>BGP ECMP</b> —maximum number of equal cost multipath for BGP and BGPv6.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	2, 4, 8, 16, 32, or 64
	Summit X450-G2	64
<b>BGPv6 (unicast address-family routes)</b> —maximum number of unicast address family routes.	Summit X460-G2	6,000
	Summit X670-G2, X770	8,000
	ExtremeSwitching X870, X690, X590	10,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
<b>BGPv6 (non-unique routes)</b> —maximum number of non-unique BGP routes.	Summit X460-G2	18,000
	Summit X670-G2, X770, ExtremeSwitching X870, X690, X590	24,000
	Summit X450-G2	14,000
<b>GRE Tunnels</b> —maximum number of GRE tunnels.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X870, X690, X590	255
	ExtremeSwitching X620, X440G2	N/A
<b>IS-IS adjacencies</b> —maximum number of supported IS-IS adjacencies.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	128
	Summit X450-G2	N/A
<b>IS-IS ECMP</b> —maximum number of equal cost multipath for IS-IS.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	2, 4, or 8
	Summit X450-G2	N/A



**Table 6: Supported Limits for Core License (continued)**

Metric	Product	Limit
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	255
	Summit X450-G2	N/A
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	256
	Summit X450-G2	N/A
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	20,000
	Summit X450-G2	N/A
IS-IS IPv4 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	25,000
	Summit X450-G2	N/A
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	25,000
	Summit X450-G2	N/A
IS-IS IPv4 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	20,000
	Summit X450-G2	N/A
IS-IS IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	10,000
	Summit X450-G2	N/A
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	10,000
	Summit X450-G2	N/A
IS-IS IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a L1/L2 router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	10,000
	Summit X450-G2	N/A
IS-IS IPv4/IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	20,000
	Summit X450-G2	N/A

**Table 6: Supported Limits for Core License (continued)**

Metric	Product	Limit
<b>IS-IS IPv4/IPv6 L2 routes in an L2 router</b> —recommended maximum number of IS-IS Level 2 routes in a Level 2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	20,000
	Summit X450-G2	N/A
<b>IS-IS IPv4/IPv6 L1 routes in an L1/L2 router</b> —recommended maximum number of IS-IS Level 1 routes in a Level 1/Level2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	20,000
	Summit X450-G2	N/A
<b>MSDP active peers</b> —maximum number of active MSDP peers.	Summit X450-G2, X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	64
<b>MSDP SA cache entries</b> —maximum number of entries in SA cache.	Summit X670-G2, X770, ExtremeSwitching X690, X590	14,000
	Summit X460-G2	10,000
	ExtremeSwitching X870	11,000
	Summit X450-G2	8,000
<b>MSDP maximum mesh groups</b> —maximum number of MSDP mesh groups.	Summit X450-G2, X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	16
<b>OSPFv2/v3 ECMP</b> —maximum number of equal cost multipath OSPFv2 and OSPFv3.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690, X590	64
<b>OSPFv2 areas</b> —as an ABR, how many OSPF areas are supported within the same switch.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	8
<b>OSPFv2 external routes</b> —recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590	10,000
	Summit X770, X670-G2, X460-G2	5,000
	Summit X450-G2	4,000
<b>OSPFv2 inter- or intra-area routes</b> —recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590	4,000
	Summit X670-G2, X460-G2, X770	2,000
	Summit X450-G2	1,600
<b>OSPFv2 interfaces</b> —recommended maximum number of OSPF interfaces on a switch (active interfaces only).	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	400
	Summit X450-G2	320

**Table 6: Supported Limits for Core License (continued)**

Metric	Product	Limit
OSPFv2 links—maximum number of links in the router LSA.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590	400
	Summit X770	419
	Summit X450-G2	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	128
	Summit X450-G2	96
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590	100
	Summit X770, X670-G2, X460-G2	50
	Summit X450-G2	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690, X590	32
	Summit X450-G2	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590	100
	Summit X460-G2, X670-G2, X770	16
	Summit X450-G2	12
OSPFv3 external routes—recommended maximum number of external routes.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	10,000
	Summit X450-G2	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590	4,000
	Summit X770, X670-G2, X460-G2	3,000
	Summit X450-G2	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces.	Summit X770	128
	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	256
	Summit X450-G2	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	64
	Summit X450-G2	48

**Table 6: Supported Limits for Core License (continued)**

Metric	Product	Limit
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590	16
	Summit X450-G2	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	256
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	145
PIM IPv4 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	256
PIM IPv6 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	2,500
	Summit X450-G2,	1,500
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	64
PIM IPv6 Limits—maximum number of secondary address per interface.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	70
PIM IPv6 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690, X590	32

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- <sup>a</sup> The table shows the total available. When installing ACL rules bound to a set of ports, rules are replicated for each port if there are ACL counters and counter compression is not enabled or if the ports are Extended Edge Switching extended ports.
  - <sup>c</sup> When there are BFD sessions with minimal timer, sessions with default timer should not be used.
  - <sup>f</sup> Effective capacity varies based on actual MAC addresses and VLAN IDs used and hash algorithm selected.
  - <sup>g</sup> Based on "configure forwarding internal-tables more I2".
  - <sup>h</sup> Based on "configure forwarding internal-tables more I3-and-ipmc".
  - <sup>j</sup> The limit depends on setting configured with configure iproute reserved-entries.
  - <sup>m</sup> The IPv4 and IPv6 multicast entries share the same hardware tables, so the effective number of IPv6 multicast entries depends on the number of IPv4 multicast entries present and vice-versa.
  - <sup>n</sup> If IGMP and MLD are simultaneously configured on the switch, the number of effective subscribers supported would be appropriately lessened.
  - <sup>o</sup> The total of all PBR next hops on all flow redirects should not exceed 4,096.
  - <sup>p</sup> The number of XNV authentications supported based on system ACL limitations.
  - <sup>q</sup> Based on "configure forwarding internal-tables more routes".
  - <sup>r</sup> Based on `configure forwarding internal-tables more routes ipv6-mask-length 128`.

# 3 Open Issues, Known Behaviors, and Resolved Issues

## Open Issues Known Behaviors Resolved Issues in ExtremeXOS 22.7

This chapter lists open software issues, limitations in ExtremeXOS system architecture (known issues), and resolved issues in ExtremeXOS.

### Open Issues

The following are new open issues for supported features found in ExtremeXOS 22.7.

**Table 7: Open Issues, Platform-Specific, and Feature Change Requests (CRs)**

CR Number	Description
<b>Extended Edge Switching</b>	
xos0074639	With multiple bridge port extenders (BPEs) attached to a partitioned port, starting Extended Edge Switching full automation by running either the <code>unconfigure switch</code> or <code>unconfigure switch all</code> command removes the partitioned port configuration, and thus full automation is not triggered, and the Extended Edge Switching topology is not created.  <b>Workaround:</b> Do not attach BPEs to partitioned ports, or use partial automation or manual configuration to create the Extended Edge Switching topology.
xos0075704	On an Extended Edge Switching ring with redundant controlling bridges (CBs) with cross-connect MLAGs and an extended port LAG with LAG members from two different cascades, if a CB loses connections to both cascades, then flood traffic from the isolated CB is not sent to any member of the extended port LAG.
<b>Policy</b>	
xos0075474	On an MLAG peer, if an explicit port classification forward rule is configured on an MLAG port, it does not work as expected.  <b>Workaround:</b> Configure the same rule on the ISC port.

### Known Behaviors

The following are limitations in ExtremeXOS system architecture that have yet to be resolved.

**Table 8: Known Issues, Platform-Specific, and Feature Change Requests (CRs)**

CR Number	Description
VRRP	
xos0075004	With policy profile 63 configured and actively used, VRRP incorrectly persists in master state after changing priority in VRRP backup node, enabling/disabling fabric routing on VRRP backup node, and then rebooting. Other policy profiles (1 through 62) do not cause this issue.

## Resolved Issues in ExtremeXOS 22.7

The following issues were resolved in ExtremeXOS 22.7. ExtremeXOS 22.7 includes all fixes up to and including ExtremeXOS 11.6.5.3, and earlier, ExtremeXOS 12.0.5, ExtremeXOS 12.1.7, ExtremeXOS 12.2.2-patch1-12, ExtremeXOS 12.3.6, ExtremeXOS 12.4.5, ExtremeXOS 12.5.5, ExtremeXOS 12.6.3, ExtremeXOS 12.6.5, ExtremeXOS 12.7.1, ExtremeXOS 15.1.5, ExtremeXOS 15.2.4, ExtremeXOS 15.3.3, ExtremeXOS 15.4.1, ExtremeXOS 15.5.1, ExtremeXOS 15.5.2, ExtremeXOS 15.6.1, ExtremeXOS 15.6.2, ExtremeXOS 15.7.1, ExtremeXOS 16.1, ExtremeXOS 16.1.2, ExtremeXOS 16.1.3, ExtremeXOS 21.1, ExtremeXOS 22.1, ExtremeXOS 22.2, ExtremeXOS 22.3, ExtremeXOS 22.4, ExtremeXOS 22.5, and ExtremeXOS 22.6. For information about those fixes, see the release notes for the specific release.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7**

CR Number	Description
General	
xos0069194	Packets with size greater than the configured IP-MTU value are forwarded if jumbo frames is enabled and ARP is resolved.
xos0069786	A hard CPU utilization limit is in effect on tasks, such as Python and shell scripts, in the "Other" control group. Base Linux tasks and ExtremeXOS tasks have no utilization limits, and are grouped together in the "EXOS" control group for display by the command <code>show process groups</code> . This allows the displayed utilization statistics to better reflect the current state, especially on switches with multi-core processors.
xos0069987	HAL process ends unexpectedly with signal 11 when executing the command that fetches entries from hardware.
xos0070318	Fallback to older option 43 Zero Touch Provisioning (ZTP) does not happen if ZTP+ fails.
xos0070488	Chalet needs to support configuring the higher port speeds: 100G, 50G, and 25G.
xos0071788	The output of the <code>show configuration/show configuration detail</code> commands does not show management port related traps configuration.
xos0072176	DNS resolves on wrong VR.
xos0072290	Process <code>rtmgr</code> ends unexpectedly when the BGP peer is rebooted.
xos0072316	PTP IP multicast packets are not forwarded.
xos0072564	Chalet stops responding if the port display string contains German special characters.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0072599	Directed broadcast traffic is not forwarded unless a port in the egress VLAN is restarted.
xos0072618	SSH/Telnet session stops responding when the command <code>run diagnostics cable ports all</code> is executed.
xos0072697	MPLS process ends unexpectedly when permanent licenses are enabled after trial license expiry.
xos0072940	Port does not come up when connected with 2-pair (1,2,3,6 wire connected) Ethernet cable.
xos0073143	After retrieving VLAN statistics through SNMP or CLI in a certain sequence, switch stops responding to VLAN related SNMP polling and show commands.
xos0073226	EDP process ends unexpectedly when processing CDP packets having a device ID that is null.
xos0073363	The command <code>show edp port detail</code> does not display correct port speed if peers run different ExtremeXOS versions.
xos0073383	Memory leak occurs on HAL when port is removed, and then added back to a LAG.
xos0073478	ELRP disables an excluded port when ELRP loop protection is enabled at egress.
xos0073553	Need to add router discovery related commands in ExtremeXOS Command Reference Guide.
xos0073608	Dropped packets on eth0 interface are accounted for in <code>ifInErrors</code> instead of <code>ifInDiscards</code> .
xos0073804	The process <code>rtmgr</code> ends unexpectedly with signal 11 after changing the gateway of L3VPN routes.
xos0073816	Zero Touch Provisioning (ZTP) does not work if the IP address from the Linux DHCP server is assigned from an address pool based on the vendor class identifier.
xos0073877	CSR privatekey generated in the switch is not accepted by certificate authority since the common name has "_" in the prefix.
xos0073894	Unable to connect with SSH using IPv6 on VR-default or user-defined VRs.
xos0073899	LACP sharing enabled port are added to link aggregator even though port speeds are different.
xos0073996	Installation of XMOD fails with error "Not enough disk space".
xos0074089	The <code>ls internal-memory</code> command needs to be replaced in <code>show tech-support</code> with correct arguments.
xos0074303	NTP restricted list configuration is not reflected in the output of the "show configuration" command causing configuration lost on reboot and NTP restrict entry not being removed when deleted.
xos0074306	Connecting with Telnet to hostname on VR-Default fails.
xos0074308	Image download fails if the URL size limit is greater than 128 characters.
xos0074338	After PIM-SM failover, the second convergence occurs resulting in minor traffic loss.



**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0074493	The process IDMGr ends unexpectedly with signal 11 when client logon and port flap occur at the same time, and if the client entry is already present multiple times in the IDMGr table.
xos0074513	Ports disabled by ELRP due to a loop in the dynamic VLAN of NetLogin is not automatically re-enabled after timer expiry.
xos0074544	Downloading ExtremeXOS image to backup/standby node in a stack fails due to TFTP block number limitation.
xos0074601	Ping is not working on MLAG port of a mixed stack of Summit X460-G2 and ExtremeSwitching X620 series switches if Summit X460-G2 is the master.
xos0074672	Unable to connect a new switch to the ExtremeCloud due to a SSL certificate exchange error.
xos0074702	Zero Touch Provisioning (ZTP) does not work over the Management interface.
xos0074751	The command <code>clear port port_list rate-limit flood out-of-profile status</code> should clear status only.
xos0074874	Need to permit the use of few special characters for SysName/SysLocation/SysContact.
xos0074898	The MAC address of IPv4 adjacency is not always updated in the hardware after stack failover.
xos0074933	Dynamic VLANs created by MVRP on MLAG ports flap continuously when the ports are in the down state.
xos0075012	Need additional configurable option for success count in flow-redirect health check command.
xos0075021	HAL process ends unexpectedly when unsupported optics are inserted into the switch.
xos0075096	SNMPwalk does not return "partinfo" of all fans present in the switch.
xos0075213	If the debug command <code>debug hal show ipv4Adj</code> is interrupted using "Q" or Ctrl-C before all adjacencies appear, then subsequent Layer 3 hardware updates do not occur. Reboot is necessary to recover.
xos0063031	Process CliMaster ends unexpectedly with signal 6 when pressing <b>CTRL + s</b> .
xos0066220	The show tech process does not exit automatically after the Telnet session that triggered it is terminated.
xos0073183	Current value in <code>show port info detail</code> is changed when the port is partitioned.
xos0073254	In Chalet, the ezMlag tab under apps does not work.
xos0073789	The process bcmASYNC ends unexpectedly at random times with continuous traffic.
xos0075510	Need to add success option under to command <code>configure flow-redirect next-hop</code> in the ExtremeXOS documentation.
<b>ExtremeSwitching X440-G2 Series Switches</b>	
xos0070362	Switch incorrectly accepts half duplex configuration with 1G speed.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0073412	On ExtremeSwitching X440G2 stacked switches, LAG configuration on combo ports is lost if the backup node is stuck after rebooting the stack.
xos0074040	Layer 2 protocols (EAPS, ERPS, STP) take 15 seconds to converge with Edge license installed.
xos0075020	Switch takes around 30 seconds to bring up all ports, which is triggering multiple STP topology changes.
xos0075030	On ExtremeSwitching X440-G2 48-port switches, ACL hardware full errors occur when Extreme Management Center (XMC) is used to push policy and telemetry.
xos0075129	IPv6 MLD packet filter installation fails in ACL double-width mode.
<b>Summit X450-G2 Series Switches</b>	
xos0060591	Log message "LAG called bcm_port_untagged_vlan_set" appears while adding LACP port to aggregator.
<b>Summit X460-G2 Series Switches</b>	
xos0073360	Random port flaps occur on Summit X460-G2-10G ports.
xos0072382	After NetLogin client authentication, at random times ARP entries are programmed without port numbers.
<b>ExtremeSwitching X590 Series Switches</b>	
xos0074378	The process PoE stops responding on the controlling bridge (CB) when polling the PoE configuration periodically from ExtremeManagement (cloud connector).
<b>ExtremeSwitching X620 Series Switches</b>	
xos0072580	For ExtremeSwitching X620 series switches, after applying policy configuration changes with <code>disable policy</code> and <code>enable policy</code> on a LAG master port that is in down state, NetLogin authentication may fail on the port.
<b>Summit X670-G2 Series Switches</b>	
xos0073006	Packets with UDP port 4000 destined to a VLAN other than ISC are lifted to VSM process.
xos0073117	On Summit X670-G2 series switches after an ExtremeXOS upgrade, the error "Deferred L2 notification code out of sync unit 0" appears in <code>show log</code> output.
<b>ExtremeSwitching X690 Series Switches</b>	
xos0072875	After enabling sharing on a port that does not support 100G, an error appears after executing <code>configure ports all partition 1x100G</code> .
xos0074587	EHOP table is leaking when port flaps on the switch.
xos0073473	Kernel crash occurs randomly after flapping the ports through which LSP is established.
<b>ExtremeSwitching X870 Series Switches</b>	
xos0072630	ExtremeSwitching X870 series switches do not accept policy-related configurations on port 128.
xos0073426	Unable to configure FEC on X870-96x-8c switch on ports with 100G capability enabled through a license.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0073880	In policy, redirect-port-list action modifier does not work properly for LAG ports.
xos0073513	After run failover, MLAG ports stays in disabled state when reload-delay timer is configured.
<b>ACL</b>	
xos0071420	After removing rules and disabling policy when failover is performed, ACL rule usage is not cleaned up. With these remaining stale ACLs, if new rules are configured, and then unconfigured, error messages appear.
xos0073276	Refresh policy fails if "meter" action is added to an existing rule.
xos0073376	ACL smart refresh is not working as expected for source address (0.0.0.0/0) match condition.
xos0073409	An empty error message appears on the console while refreshing a policy that contains an IPv6 rule.
xos0074344	ACL process signal 5 appears when changing active l2pt profile on ports.
xos0074701	Well-known MAC address added as a token for policy.
<b>BGP</b>	
xos0073222	BGP sessions go down when they receive an update with route 0.0.0.0/32.
<b>BGP Auto-peering</b>	
xos0070932	With BGP auto-peering and VXLAN setup, traffic is not forwarded to some RTEPs, when back-to-back ECMP links are connected.
xos0072783	VLAN process ends unexpectedly when disabling all remote VXLAN tunnel end points using the command <code>disable virtual-network remote-endpoint vxlan all</code> .
<b>Clocking</b>	
xos0072943	PTPV2 process ends unexpectedly with signal 5 when rebooting the switch with Network Timing license enabled.
xos0075437	Random values are added to GTP packets.
<b>EAPS</b>	
xos0067218	Short loop occurs in EAPS with shared ports after link failure recovery.
<b>ERPS</b>	
xos0071438	ERPS rings do not have a way to configure ring ID.
<b>Extended Edge Switching</b>	
xos0072827	Need to support IP gateways on Extended Edge Switching bridge port extenders (BPEs) extended ports.
xos0072872	On Extended Edge Switching configurations, the STP port of peer switch, goes to "blocking" instead of "disabled" state when the connecting port on root bridge is disabled using the command <code>disable port port #</code> .

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0072936	When using Extended Edge Switching full automation with multiple controlling bridge (CB) MLAG peer candidates, automation stops (as designed), but displays errors due to clean-up effort that involves deleting non-existent VLANs.
xos0073266	When Extended Edge Switching auto-configuration is used, the MLAG master ports connecting to BPEs on the two peers are not always the same. This leads to different local keys being used by the MLAG peers and traffic being lost in case of a failover.
xos0075177	In Extended Edge Switching/MLAG environments, Dot1x authentication fails when the authenticator side MLAG cascade port goes down.
xos0075620	Under certain conditions, a ring may time out trying to converge and remain in the severed state. If a ring has suffered a timeout and is persisting in the severed state, the <code>show vpx topology detail</code> command shows "Ring (Severed) - Formation Disabled". To resolve the severed state, disable or enable a severed cascade port on the ring (marked with "S" flag in the <code>show vpx topology detail</code> command).
xos0075516	PoE is not working as expected with Extended Edge Switching.
xos0075689	Switch becomes unresponsive for 5-15 minutes when UPM executes command in orchestration mode on both MLAG controlling bridges.
<b>FDB</b>	
xos0073070	The limit-learning feature is not working as expected in MAC Move/LOOP scenarios.
xos0073139	When user-configured ACLs are applied on limit learning ports, packets are leaked.
<b>Fabric Attach</b>	
xos0072447	Dynamically created Fabric Attach assignments are not cleared even after removing the policy profile.
xos0074187	After a Fabric Attach client reboot or after disabling/enabling a port, the uplink port is not added to a dynamic VLAN on the Fabric Attach proxy.
<b>MLAG</b>	
xos0073394	FDB is not check-pointed correctly with W-MLAG configuration.
xos0073462	MLAG peers do not verify the LACP MAC addresses of the neighbor switches.
xos0074039	After disabling, and then enabling the ports, traffic from one MLAG port is not egressing by the other MLAG port.
<b>MPLS</b>	
xos0072916	Traffic is not forwarded to VPLS peer after LSP path failover.
xos0073248	Ping fails between switches when the connected port is removed from the VMAN.
xos0073490	Layer 3 VPN routes are not installed on a backup node on a stack after slot reboot.
xos0073818	Packets originating in a switch fail to egress after removing the ports from service VLAN.
xos0074611	Label mismatch issues between LDP routers after enabling LDP loop detection.
xos0074924	VPLS: VP leak occurs when switching pseudowire path from RSVP to LDP and vice versa.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0074795	Port flaps cause FDB learning to stop on network VLAN ports.
<b>Network Login</b>	
xos0072913	After timing out on Dot1x supplicant expiry timer, switch does not respond to EAPOL start packets received from supplicants.
<b>Optics</b>	
xos0072483	ExtremeSwitching X690, X870 and X590 series switches do not support 100G Optic/AOC cables on stacking ports.
xos0072824	Need support for the following cables: <ul style="list-style-type: none"> <li>• 10304 Siemon 900074-10-03-L-ENG 1m 24AWG SFP+</li> <li>• 10305 Siemon 900075-10-03-L-ENG 3m 24AWG SFP+</li> <li>• 10306 Siemon 900076-10-03-L-ENG 5m 24AWG SFP+</li> <li>• 10307 Siemon 900077-10-03-L-ENG 10m 24AWG SFP+</li> </ul>
xos0073995	Need to avoid bringing down OSPF neighborship when neighbor is restarted gracefully.
xos0074073	SNMP get for entPhySensorOperStatus returns "unavailable" for QSFP optics.
xos0074200	The OPNEXT transceiver device does not link reliably on ExtremeSwitching X690 and X590series switches.
xos0074595	Even though the port speed is properly configured, the 100G ports port speed compatibility log message appears.
<b>OSPFv2</b>	
xos0063567	OSPF stops exporting static routes when NSSA area export is disabled.
xos0072684	Router LSAs are dropped if they contains more than 400+ links.
xos0072748	After rebooting the switch, OSPF address range conflict error messages appear when summarized route range subnets between the OSPF areas overlap.
xos0073893	ExtremeXOS generates incorrect values for remote interface sub-TLV in OSPF type 10 LSAs.
xos0073995	Need to avoid bringing down OSPF neighborship when neighbor is restarted gracefully.
<b>Policy</b>	
xos0071673	Need a provision to modify the default precedence of OnePolicy profile rules.
xos0072647	The polMgr process ends unexpectedly on backup MSM after executing <code>refresh policy</code> , and then <code>unconfigure policy</code> .
xos0075057	Traffic drop occurs when receiving LLDP packets on the ONEPolicy admin profile configured port.
<b>Security</b>	
xos0066643	NetLogin session is not cleared in session timeout when session timeout is received from RADIUS attribute.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0072335	Dot1X client remains authenticated and is not moved to destination VLAN returned by RADIUS from guest VLAN even after enabling EAPOL on client computer.
xos0072801	If a NetLogin MAC address entry is learned on multiple VLANs, then the entry is re-authenticated only in the first VLAN on which it was authenticated.
xos0072944	Unable to list directory contents using SFTP.
xos0072957	ExtremeXOS command needs provision to support CEP precedence for authentication protocol order.
xos0073163	Unable to enable policy from initial Extreme Management Center enforce due to timeout of ACL resource reservation.
xos0073224	In Policy mode, dynamically added ports on a VLAN for a MAC session are not removed from the VLAN even though the MAC session is overwritten by a Dot1x session.
xos0073312	Note should be displayed when configuring Dot1x server timeout, such that the value should be greater than RADIUS server timeout.
xos0073320	Need new commands to enable/disable external Python script execution that is enabled by default.
xos0073378	With FIPS mode enabled, and after upgrading from ExtremeXOS 16.1, Exsshd process ends unexpectedly with signal 11 when attempting to log on to SSH.
xos0073516	NetLogin-authenticated clients are cleared with the reason admin-reset when other clients that were earlier authenticated on that port existing under a terminated session moved to non-NetLogin port.
xos0073578	The traffic destined to the web-redirect server is blocked when default drop is applied to a profile with "pvid 0".
xos0073897	In OnePolicy, new policy profiles received on re-authentication from RADIUS/NAC servers do not take effect.
xos0073972	TACACS does not successfully authenticate when using 2FA.
xos0074435	Netlogin Dot1x authentication fails if port has already been moved to authentication failure VLAN, and VLAN VSA for Dot1x authentication is not supplied in the RADIUS accept packet.
xos0074567	NetLogin authenticated clients are cleared due to admin reset when MAC move occurs.
xos0074606	NetLogin users are authenticated to random destinations when destination VLAN attributes from the RADIUS server are not received.
xos0074910	Captive portal stops working when more clients try to access the captive portal page.
<b>sFlow</b>	
xos0073188	When App Telemetry Analytics is configured, sFlow warnings appear in logs on VPEX-enabled ports.
<b>SNMP</b>	
xos0070831	Value set for CEP for SNMP MIB etsysMultiAuthSystemAdminPrecedence object is omitted after reboot/restart of NetLogin process.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0073019	SNMP get next on ctAliasProtocolAddressInterface MIB table does not return correct next OID.
xos0073216	Fetching values using SNMP for "entPhySensorEntry" gives incorrect values.
xos0073251	Snmpmaster process ends unexpectedly in rare cases when packets received at an application fail.
xos0074058	SNMPwalk to fetch user-created VRs neighbor-discovery always returns vr-Default information.
xos0074806	SNMP walk fails when trap receiver is configured using SNMP community strings starting with "v,w,x,y,z".
<b>Stacking</b>	
xos0065997	In SummitStacks with ring topology, when a backup node is rebooting, the standby node also gets rebooted.
xos0071254	Login issues occur when using Telnet to connect to other slots from master node with RADIUS mgmt-access enabled.
xos0072870	On SummitStacks, slots are very slow to become operational if learning is disabled on multiple VLANs.
xos0072932	Software watchdog expiration and kernel threads stuck error messages occur in stack setup. 10/03/2018 11:39:00.91 <Crit:Kern.Card.Alert> Slot-1: CPU 0: Kernel thread was stuck for 5.00 seconds, time: 444947377 msec 10/03/2018 11:38:58.40 <Crit:Kern.Card.Alert> Slot-1: CPU 0: soft watchdog expiration warning at 76ab5288 (0x76ab5288) for 2 seconds, process exstm (1988)
xos0073370	ExtremeSwitching X440-G2 and X620 series switches are not stable when used in a stack.
xos0072978	Dot1x authentication fails when Dot1x state machine remains in aborting state for the client.
xos0073002	Need "smart refresh" support for IPv6 policies.
xos0073619	If a slot containing a LAG member port is powered down, then that traffic initially forwarded through the LAG member port may be dropped for up to 20 seconds.
xos0074176	CPU-originated packets are double tagged with an incorrect outer tag of zero if they originate from master and egress out of a non-master node through another transit slot.
<b>STP</b>	
xos0071418	Ports configured for BPDU restriction are re-enabled on recovery-timeout even if administratively disabled.
xos0074195	Continuous DM error messages are logged if MLAG and STP are configured on stacks containing ONIE series switches (X870, X690).
xos0074481	All participating VLANs are removed from STP after deleting one port + VLAN from the STP domain.

**Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.7 (continued)**

CR Number	Description
xos0075207	In the ExtremeXOS User Guide STP Chapter, the statement about "STPD VLANs" should be removed.
<b>VLAN</b>	
xos0064449	VLAN process ends unexpectedly with signal 11 when disable sharing port/delete VLAN ports with ESRP configuration.
xos0074374	ExtremeXOS does not support port VLAN monitoring on PSTAG ports.
xos0074871	EMS log message should be generated when a port cannot be added to a VLAN.
xos0074912	Traffic loss occurs with VLAN configuration after a save and reboot.
<b>VRRP</b>	
xos0072581	In VRRP IPv6 environment, router advertisement with link-local IPv6 interface address causes host connectivity issues.
xos0073573	VRRP IPv6 VMAC is installed as IPv4 VMAC when VLAN ID is changed.