ExtremeXOS Release Notes

Software Version 32.3

9037669-00 Rev AB
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Table of Contents

Preface

Read the following topics to learn about:

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

Conventions

To help you better understand the information presented in this guide, the following topics describe the formatting conventions used for notes, text, and other elements.

Text Conventions

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

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

Table 1: Notes and warnings

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

Table 2: Text

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

Table 3: Command syntax

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

Platform-Dependent Conventions

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

- ExtremeSwitching® 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/). 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 device 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 *device*.

Send Feedback

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

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

To send feedback, do either of the following:

- Access the feedback form at https://www.extremenetworks.com/documentation-feedback/.
- Email us at documentation@extremenetworks.com.

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

Help and Support

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

Extreme Portal

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

The Hub

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

Call GTAC

For immediate support: (800) 998 2408 (toll-free in U.S. and Canada) or 1 (408) 579 2826. For the support phone number in your country, visit: www.extremenetworks.com/support/contact

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

- Your Extreme Networks service contract number, or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any actions already taken to resolve the problem

- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

Subscribe to Product Announcements

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

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

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

Related Publications

ExtremeXOS Publications

- *ExtremeXOS 32.3 Command Reference Guide*
- *ExtremeXOS 32.3 Feature License Requirements*
- *ExtremeXOS and Switch Engine 32.3 SNMP Traps Reference*
- *ExtremeXOS 32.3 User Guide*
- *ExtremeXOS Release Notes*
- *ExtremeXOS Quick Guide*
- *ACL Solutions Guide*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*
- *Extreme Optics Compatibility*
- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*
- *Using AVB with Extreme Switches*

ExtremeCloud IQ - Site Engine Publications

- *Extreme Management Center User Guide*
- ExtremeCloud IQ - Site Engine online help is available by clicking the **?** icon on all screens. The online help provides detailed explanations of how to configure and manage your network using ExtremeCloud IQ - Site Engine.

Open Source Declarations

Some software files have been licensed under certain open source licenses. More information is available at: www.extremenetworks.com/support/policies/open-source-declaration/.

Overview

These release notes documents ExtremeXOS 32.3, which adds features and resolves software deficiencies.

Security Information

The following section covers important security information for ExtremeXOS 32.3.

Linux Kernel

ExtremeXOS 32.3 uses Linux Kernel 5.4 for ExtremeSwitching X465, X590 and X695 series switches, and Linux Kernel 4.14 for all other switches.

OpenSSL Version

ExtremeXOS 32.3 uses FIPS openssl-fips-2.0.16.

Upgrading ExtremeXOS

For instructions about upgrading ExtremeXOS software, see *Software Upgrade and Boot Options* in *ExtremeXOS 32.3 User Guide*.

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 system displays the following error message: `Error: Image can only be installed to the non-active partition.` An ExtremeXOS modular software package (.xmod file) can still be downloaded and installed on either the active or alternate partition.
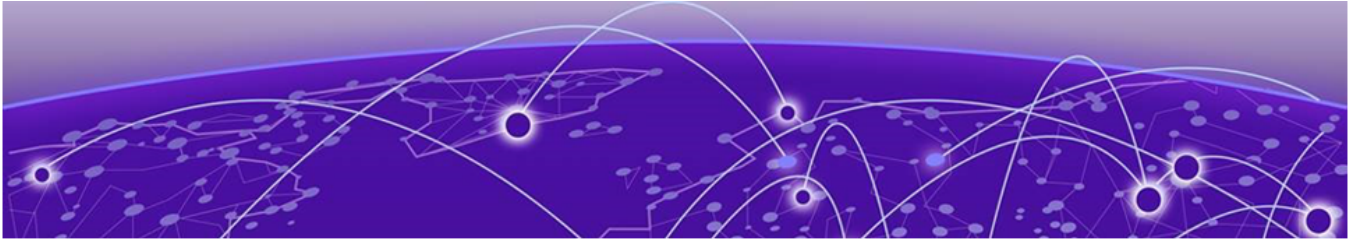
> **Note**
> New ExtremeSwitching X435 PoE switches with a Giga device MCU part (switch default ships with supported EXOS versions from the factory) will prevent the switch downgrade to older EXOS versions.
>
> The following error message is displayed during the downgrades to older versions:
> ```
> Error: Failed to download image - summitlite_arm-31.6.1.3.xos does not
> include compatible PoE microcontroller support. See the User Guide for
> information on installing a newer software release. See the
> Hardware/Software Compatibility and Recommendation Matrices to verify the
> supported releases.
> ```
> The switch can be identified for the inclusion of the Giga device MCU by checking the PoE firmware revision (5.0 or later) by entering the `show inline-power stats` command (line four):
> ```
> # show inline-power stats
> Inline-Power Slot Statistics
> Firmware status              : Operational
> Firmware revision            : 5.0.0b4
> Total ports powered          : 3
> Total ports awaiting power   : 20
> Total ports faulted          : 0
> Total ports disabled         : 1
> ```

Newly Purchased Switches Require Software Upgrade

Newly delivered switches typically have pre-GA (general availability) ExtremeXOS software installed. You should promptly upgrade the software to the latest version available by visiting the Extreme Portal.

For information about upgrading the ExtremeXOS software, see the *ExtremeXOS Upgrade Process* topic in the *Software Upgrade and Boot Options* chapter of the *ExtremeXOS 32.3 User Guide*.

Default ExtremeXOS® Settings

The following table shows the default settings for ExtremeXOS starting with version 31.4, and shows any changes that have been made to these settings and in what version these changes were made.

Table 4: Default ExtremeXOS Settings

Feature	31.4 and earlier	31.5	31.6 and later
Account Lockout	After 3 consecutive login failures, account is locked for 5 minutes. [a]		
AVB	Disabled.		
BFD Strict Session Protection	Disabled.		
BGP	Disabled.		
Bluetooth	Enabled.		
BOOTP Relay	Disabled.		
CDP	Enabled.		
Configuration auto save	Disabled.		
Clear-flow	Disabled.		
Diagnostics	Admin level privileges required to show diagnostics. [a]		
DHCP	Disabled.		
DNS Cache Resolver and Analytics	Disabled.		
IPFIX	Disabled.		
IP NAT	Disabled.		
EAPS	Disabled.		
EDP	Enabled on management port.		
ELRP	Disabled.		
ESRP	Disabled.		
Extended Edge Switching (VPEX)	Disabled.		
ExtremeCloud IQ	Enabled		

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[a] If you choose enhanced security mode when initially setting up the switch or after running `unconfigure switch all`.

Table 4: Default ExtremeXOS Settings (continued)

Feature	31.4 and earlier	31.5	31.6 and later
FEC	Disabled.		Enabled on Native 25Gb ports.
Identity Management	Disabled.		
IGMP	Enabled, set to IGMPv2 compatibility mode.		
IGMP Snooping	Enabled.		
Image Integrity Check	Disabled.		
IP Route Compression	Enabled.		
ISIS	Disabled.		
LLDP	Enabled.		
Log	Admin level privileges required to show log. [a]		
Logging memory buffer	Generate an event when the logging memory buffer exceeds 90% of capacity. [a]		
MAC Security	Disabled.		
MLD	Disabled.		
MLD Snooping	Disabled.		
MPLS	Disabled.		
MSRP	Disabled.		
MSTP	Enabled.		
NetLogin	All types of authentication are disabled.		
NTP	Disabled.		
ONEPolicy	Disabled.		
Policy rule model	Hierarchical (Unless upgrading from 30.5 with a saved configuration set to access list.)		
OpenFlow	Not supported.		
OSPF	Disabled.		
OVSDB	Disabled.		
Passwords	Plain text password entry not allowed. [a]		
PIM	Disabled.		
PIM Snooping	Disabled.		

Table 4: Default ExtremeXOS Settings (continued)

Feature	31.4 and earlier	31.5	31.6 and later
PoE Fast PoE Perpetual PoE	Enabled. Disabled. 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. [a]		
SSH	Disabled.		
Stacking-support	Disabled, except for X450-G2, X465.		
Stacking auto-discovery	Enabled.		
STP	Enabled.		
Syslog	Disabled.		
TACACS	Disabled.		
Telnet	Disabled. [a]		Enabled.
VPEX IP Multicast Replication	Controlling Bridge		
VPLS	All newly created VPLS instances are enabled.		
Watchdog	Enabled.		
Web HTTP server	Enabled. [a]		
Web HTTPS server	Disabled. [a]		
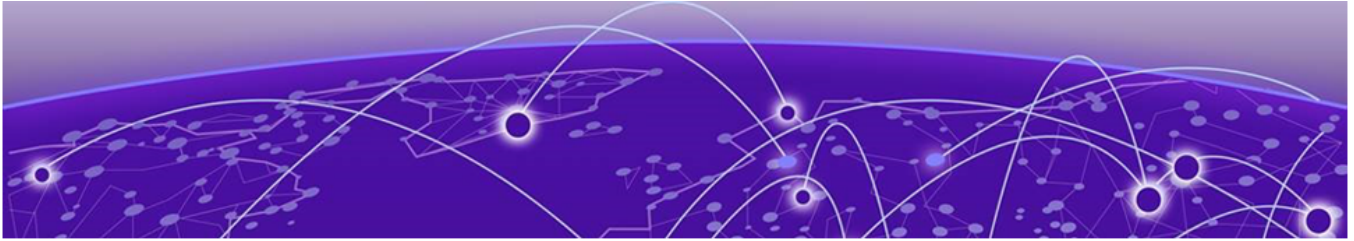
Image File Names

You can identify the appropriate image or module for your platform based on the file name prefix of the image.

Table 5: Image Types (Prefixes)

Switches	Image File Type (Prefix)
ExtremeSwitching X465, X695, and X590	`onie-` Example: `onie-22.2.1.2.xos` **Note:** These image files use the Open Network Install Environment (ONIE).
ExtremeSwitching X440-G2, X450-G2, X460-G2, and X620	`summitX-` Example: `summitX-22.2.1.2.xos`

ExtremeSwitching X435	`summitlite_arm-`
	Example:
	`summitlite_arm-30.5.0.102.xos`

New and Corrected Features in ExtremeXOS 32.3

This section lists the new and corrected features supported in the 32.3 software:

IPv6 transport in IPv4 GRE Tunnel

Version 32.3 adds the ability to transport IPv6 payloads in IPv4 GRE tunnel, allowing the GRE tunnel to be configured with multiple IPv6 addresses. ECMP is also supported for IPv6 destinations reachable via GRE tunnel. IPv6 forwarding can be enabled on the GRE tunnel that has an existing IPv6 address configured, but only one ECMP Nexthop is installed in the hardware.

Supported Platforms

ExtremeSwitching X590, X695, and X465 series switches.

New CLI Command

```
configure tunnel tunnel_name ipv6 tcp adjust-mss [off | on
tcp_mss_value]
```

Auto-generate SSL Certificate for HTTPS

Version 32.3 adds a security enhancement that auto-generates a Secure Socket Layer (SSL) certificate when a web HTTPS is enabled. The certificate is generated with default configurations for the following:

- Key length
- Country-code

- Organization name
- Common name:
- State
- Locality
- Organization unit
- Email

Once the certificate is successfully generated, the HTTPS login will be granted. The generation and validation of the certificate and key behaves in the same way as those that are generated through the command line.

Automatic Configuration of Default Speed on SFP28 Transceivers

Version 32.3 adds automatic configuration of the default speed on non-partitionable native SFP28 ports, based on the inserted optics. This feature can be overwritten by using port configuration commands.

Supported Platforms

ExtremeSwitching X695 series switch.

Dynamic Name Server Limit Enhancement

Version 32.3 increases the total number of name servers to 16. Previously, there was a maximum of eight DNS servers, which included both dynamic and static servers. Now, there can be eight dynamic and eight static name servers.

Supported Platforms

All ExtremeSwitching platforms.

Fabric Attach Triggered Signaling

Version 32.3 adds support for Fabric Attach triggered signaling that replaces LLDP timer triggers to create VLAN/NSI binding. This feature provides faster learning of VLAN/NSI bindings when a switch or link recovers from failure. Fabric Attach triggered signaling of VLAN/NSI mappings occurs when:

- A link between the client and proxy flaps
- A client switch reboots
- A proxy switch reboots
- A link between the server and proxy flaps
- A server switch reboots
- A new VLAN/NSI mapping is added in the client

Limitations

A proxy switch sends out the maximum of 94 VLAN/NSI mapping requests to a server based on the time the mappings are created. Only the first 94 mappings added in the VLAN/NSI DB are sent to the server for approval.

Supported Platforms

All platforms that support Fabric Attach.

Link Aggregation Group for Ports Supporting Different Channelization

Version 32.3 adds Link Aggregation Group (LAG) support for ports that have different maximum speed capability while operating at the same speed.

Supported Platforms

All ExtremeSwitching platforms.

OSPF Inter-VR Route Redistribution

Beginning with version 32.3, the Open Shortest Path First (OSPF) Inter-VR route redistribution feature adds support for the redistribution of routes between multiple OSPF instances at the same time in different VRs. OSPF uses Route Manager to install the necessary routes in the route table of the VR where inter-VR redistribution is enabled. An Instance ID can also be configured for OSPF.

Supported Platforms

All platforms.

New CLI Commands

```
configure ospf instanceid instance-identifier

disable ospf export {vr} vr-name route-type

enable ospf export {vr} vr-name route-type [policy-map | cost cost type
ase-type-1 | ase-type-2] {tag number}] {exclude-private}

show ospf inter-vr-export

show ospf inter-vr-export {detail}
```

Changed CLI Commands

```
configure iproute {ipv4} priority [auto-peering | blackhole | bootp
| ebgp |host-mobility | ibgp | icmp | isis | isis-level-1 | isis-
level-1-external | isis-level-2 | isis-level-2-external | mpls | ospf-
as-external | ospf-extern1 | ospf-extern2 | ospf-inter | ospf-intra |
rip | static | evpn | ospf-inter-vr] priority {vr vrname}
```

```
show iproute {ipv4} {priority | vlan vlan_name | permanent | ip_address
netmask | summary} {multicast | unicast} {vr vrname}}

show iproute {ipv4} [{mpls} {{vlan} name | lsp lsp_name | ipaddress
netmask | ipNetmask | origin [direct | static | blackhole | rip | bootp
| icmp | ospf | ospf-intra | ospf-inter | ospf-extern1 | ospf-extern2
| bgp | ebgp | ibgp | isis | isis | isis-level-1 | isis-level-2 | isis-
level-1-external | isis-level-2-external | host-mobility | auto-peering
| mpls | evpn {signaling-protocol [ldp | rsvp-te | static]} | ospf-
inter-vr]] {unicast} {vr vrname}

show ospf

unconfigure iproute {ipv4} priority [all | blackhole | bootp | ebgp |
ibgp | icmp | isis | isis-level-1 | isis-level-1-external | isis-level-2
| isis-level-2-external | mpls | ospf-as-external | ospf-extern1 | ospf-
extern2 | ospf-inter | ospf-intra | rip | static | evpn | ospf-inter-vr]
{vr vrname}
```

PIM Multicast Routing Over GRE Tunnels

Version 32.3 adds the ability to configure IPv4 Protocol Independent Multicast (PIM) traffic over GRE tunnels. PIM control packets are exchanged between GRE tunnel endpoints across the GRE tunnel, forming a PIM neighborship across the GRE tunnel. Similar to IPv4 unicast support on GRE tunnels, multicast data packets are routed from a tenant interface to the far end of the IPv4 GRE tunnel. The IPv4 next-hop for the multicast packets is the IPv4 tunnel IP of the BGP neighbor.

Supported Platforms

ExtremeSwitching X590, X465, and X695 series switches, and on X590 and X465 series stacks.

Limitations

This feature has the following limitations:

- The maximum number of GRE tunnels supported is 64.
- The maximum number of VRs supported is 32.
- Routing across VRs is not supported.
- IPv6 multicast routing over tunnel is not supported.
- MSDP is not supported with this feature.
- Stacking is only supported on ExtremeSwitching X590 and X465 series switches.

New CLI Commands

The following new CLI commands support this feature:

```
configure pim {ipv4} add {tunnel} [tunnel_name | tunnel all] {sparse |
dense} {passive}
```

```
configure pim {ipv4} delete tunnel [tunnel_name | tunnel all]

configure pim {ipv4} timer hello_interval jp_interval [{tunnel}
tunnel_name | tunnel all]

configure pim {ipv4} [{tunnel} tunnel_name | tunnel all] dr-priority
priority

disable ipmcforwarding {tunnel tunnel_name}

disable pim {ipv4} ssm tunnel [tunnel_name | tunnel all]

enable ipmcforwarding {tunnel tunnel_name}

enable pim {ipv4} ssm tunnel [tunnel_name | tunnel all]

show pim tunnel

unconfigure pim {ipv4}{tunnel tunnel_name}
```

Post Login Banner - Managed by ExtremeCloud IQ

Beginning with version 32.3, systems managed by ExtremeCloud IQ will receive the following login message at the start of a CLI shell session:

```
Warning: This system is connected to ExtremeCloud IQ!
        Do not make changes directly from this CLI unless you know they
        do not conflict with configuration managed by ExtremeCloud IQ.
```

Table 6: Supported Platforms

Switch Series	Switch Models
ExtremeSwitching X435	X435-8T-4S X435-8P-4S X435-8P-2T-W X435-24T-4S X435-24P-4S
ExtremeSwitching X440-G2	X440-G2-24P-10GE4 X440-G2-48P-10GE4 X440-G2-12T-10GE4 X440-G2-12P-10GE4 X440-G2-24T-10GE4 X440-G2-48T-10GE4
ExtremeSwitching X450-G2	X450-G2-24P-10GE X450-G2-48P-10GE X450-G2-24P-GE4 X450-G2-48P-GE4

Table 6: Supported Platforms (continued)

Switch Series	Switch Models
ExtremeSwitching X460-G2	X460-G2-24P-10GE4 X460-G2-48P-10GE4 X460-G2-16MP-32P-10GE4 X460-G2-24P-48HP-10GE4
ExtremeSwitching X465	X465-48P X465-24MU-24W X465-24W X465-48W X465-24MU

Transceiver Speed MIB Support

Version 32.3 introduces transceiver speed MIB capabilities support for ExtremeCloud IQ. With this feature, ExtremeCloud IQ will only allow port speeds that are supported by the tranceiver to be pushed to the switch. If the transceiver supports more than one speed, the MIB will only report the speed that the operating system supports.

Table 7: Supported Platforms

Switch Series	Switch Models
ExtremeSwitching X435	X435-8T-4S X435-8P-4S X435-8P-2T-W X435-24T-4S X435-24P-4S
ExtremeSwitching X440-G2	X440-G2-24P-10GE4 X440-G2-48P-10GE4 X440-G2-12T-10GE4 X440-G2-12P-10GE4 X440-G2-24T-10GE4 X440-G2-48T-10GE4
ExtremeSwitching X450-G2	X450-G2-24P-10GE X450-G2-48P-10GE X450-G2-24P-GE4 X450-G2-48P-GE4
ExtremeSwitching X460-G2	X460-G2-24P-10GE4 X460-G2-48P-10GE4 X460-G2-16MP-32P-10GE4 X460-G2-24P-48HP-10GE4
ExtremeSwitching X465	X465-48P X465-24MU-24W X465-24W X465-48W X465-24MU

ExtremeCloud IQ Agent Support

ExtremeXOS 32.3 supports ExtremeCloud IQ. For network administrators looking for unified management of access points, switches, and routers, ExtremeCloud IQ is a cloud-driven network management application that:

- Simplifies network operations through an easy to use and intuitive interface, including minimal touch onboarding of devices.
- Provides ultimate flexibility in deployment choice, cloud platform choice, and OS choice.
- Offers unlimited data duration for more informed networking decisions.

> **Important**
> Check the ExtremeCloud IQ release notes to ensure support for your version has been added before upgrading.

This release supports device discovery, basic monitoring, visibility into homogenous stacking, and the ability to configure an optional user-defined virtual router (VR) and server address for ExtremeCloud IQ agent to connect to. These values are used instead of any auto-detected values.

For more information about ExtremeCloud IQ, go to https://www.extremenetworks.com/support/documentation/extremecloud-iq/.

Table 8: Supported Platforms

Switch Series	Switch Models
ExtremeSwitching X435	X435-8T-4S X435-8P-4S X435-8P-2T-W X435-24T-4S X435-24P-4S
ExtremeSwitching X440-G2	X440-G2-24P-10GE4 X440-G2-48P-10GE4 X440-G2-12T-10GE4 X440-G2-12P-10GE4 X440-G2-24T-10GE4 X440-G2-48T-10GE4
ExtremeSwitching X450-G2	X450-G2-24P-10GE X450-G2-48P-10GE X450-G2-24P-GE4 X450-G2-48P-GE4

Table 8: Supported Platforms (continued)

Switch Series	Switch Models
ExtremeSwitching X460-G2	X460-G2-24P-10GE4 X460-G2-48P-10GE4 X460-G2-16MP-32P-10GE4 X460-G2-24P-48HP-10GE4
ExtremeSwitching X465	X465-48P X465-24MU-24W X465-24W X465-48W X465-24MU

Extreme Hardware/Software Compatibility and Recommendation Matrices

ExtremeXOS and Switch Engine Software Support provides information about the minimum version of ExtremeXOS software required to support switches.

The Extreme Optics Compatibility website displays supported hardware platforms, technical specifications, and usage considerations for pluggable optical devices (transceivers and cables) used in all Extreme Networks operating environments. To access the site, open https://optics.extremenetworks.com/EXOS/ in a web browser.

To find the recommended ExtremeXOS versions for specific hardware platforms, see *ExtremeXOS and Switch Engine Release Recommendations*.

The latest versions of this and other ExtremeXOS guides are at: www.extremenetworks.com/documentation/.

Compatibility with ExtremeCloud IQ – Site Engine

ExtremeXOS 32.3 is compatible with the version of ExtremeCloud IQ - Site Engine shown in this table:
http://emc.extremenetworks.com/content/common/releasenotes/extended_firmware_support.htm

Supported MIBs

The Extreme Networks management information bases (MIBs) are located at 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 32.3 User Guide*.

Tested Third-Party Products

The following third-party products have been tested for ExtremeXOS 32.3.

Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS

Extreme Switch Security Assessment

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

Limits

This chapter summarizes the supported limits in ExtremeXOS 32.3.

Limits Overview

The limits data is grouped by license level that contains the associated features:
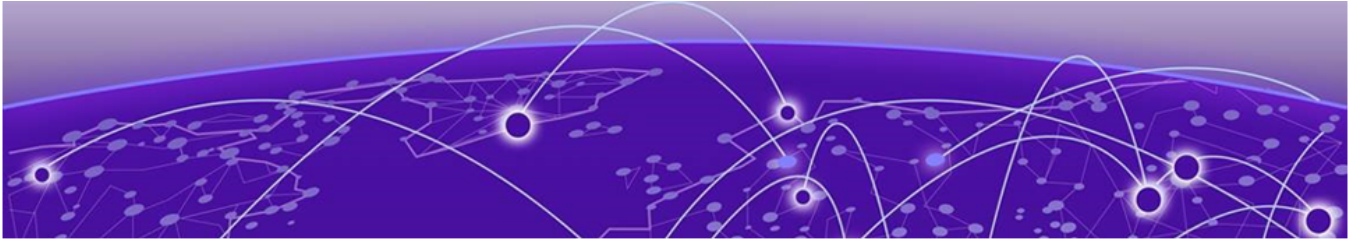
- Value Edge License Limits on page 33
- Edge License Limits on page 45
- Advanced Edge License Limits on page 68
- Core License Limits on page 76

Non-universal switches include the following license levels:

Switch Category	Switches	Applicable License Levels
Non-universal switches	X435 *, X440-G2, X450-G2, X460-G2, X465, X590, X620, X695	Value Edge *, Edge, Advanced Edge, Core
Note: * The X435 is the only switch that supports the Value Edge license level.		

The following figure illustrates that each license level builds on the features of the license level below it. For example, the Advanced Edge license includes all of the features in the Edge license, plus the features in the Advance Edge license level.
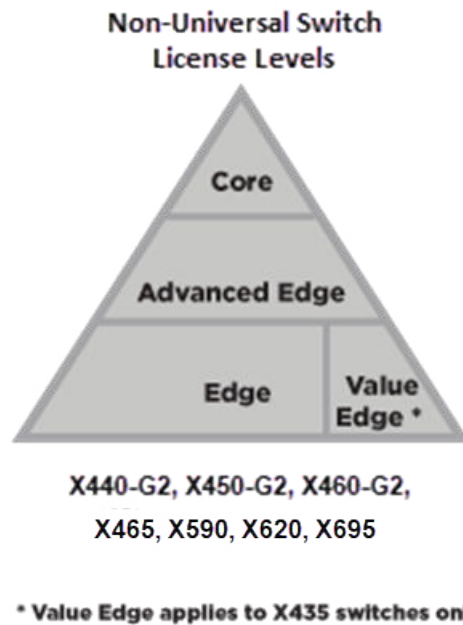
Figure 1: License Levels for non-Universal Switches

For more information about licenses, see *ExtremeXOS 32.3 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 in use. For applicable limits, see the following tables for the controlling bridge you are using.

Value Edge License Limits

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

Table 9: Supported Limits for Value Edge License

Metric	Product	Limit
AAA (local)—maximum number of admin and local user accounts.	ExtremeSwitching X435	16
Access lists (meters)—maximum number of meters.	ExtremeSwitching X435	512 ingress
Access lists (policies)—suggested maximum number of lines in a single policy file.	ExtremeSwitching X435	300,000
Access lists (policies)—maximum number of rules in a single policy file. [a]	ExtremeSwitching X435	1,024 ingress 0 egress
Access lists (slices)—number of ACL slices.	ExtremeSwitching X435	8 ingress only
ACL Per Port Meters—number of meters supported per port.	ExtremeSwitching X435	8
ACL port ranges	ExtremeSwitching X435	32
Meters Packets-Per-Second Capable	ExtremeSwitching X435	Yes
AVB (audio video bridging)—maximum number of active streams.	ExtremeSwitching X435	512
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	ExtremeSwitching X435	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	ExtremeSwitching X435	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents.	ExtremeSwitching X435	30
Connectivity fault management (CFM)—maximum number or CFM domains.	ExtremeSwitching X435	8
CFM—maximum number of CFM associations.	ExtremeSwitching X435	256
CFM—maximum number of CFM up end points.	ExtremeSwitching X435	32
CFM—maximum number of CFM down end points.	ExtremeSwitching X435	32

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
CFM—maximum number of CFM remote end points per up/down end point.	ExtremeSwitching X435	2,000
CFM—maximum number of dot1ag ports.	ExtremeSwitching X435	128
CFM—maximum number of CFM segments.	ExtremeSwitching X435	1,000
CFM—maximum number of MIPs.	ExtremeSwitching X435	256
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	ExtremeSwitching X435	30 (with static routes)
DHCP snooping entries—maximum number of DHCP snooping entries.	ExtremeSwitching X435	30
Dynamic ACLs—maximum number of ACLs processed per second. **Note:** Limits are load-dependent.	ExtremeSwitching X435 with 50 DACLs with 500 DACLs	10 5
EAPS domains—maximum number of EAPS domains.	ExtremeSwitching X435	4
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X435	1,000
ERPS domains—maximum number of ERPS domains with or without CFM configured.	ExtremeSwitching X435	4
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X435	1,000
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching X435	2,000
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X435	7,844 pps
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching X435	16,019
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	ExtremeSwitching X435	16,384
FDB (maximum L2 entries)—maximum number of MAC addresses.	ExtremeSwitching X435	16,384 [9]

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching X435	512
Identity management—maximum number of Blacklist entries.	ExtremeSwitching X435	512
Identity management—maximum number of Whitelist entries.	ExtremeSwitching X435	512
Identity management—maximum number of roles that can be created.	ExtremeSwitching X435	64
Identity management—maximum role hierarchy depth allowed.	ExtremeSwitching X435	5
Identity management—maximum number of attribute value pairs in a role match criteria.	ExtremeSwitching X435	16
Identity management—maximum number of child roles for a role.	ExtremeSwitching X435	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	ExtremeSwitching X435	8
Identity management—maximum number of LDAP servers that can be configured.	ExtremeSwitching X435	8
Identity management—maximum number of Kerberos servers that can be configured.	ExtremeSwitching X435	20
Identity management—maximum database memory size.	ExtremeSwitching X435	512
Identity management—recommended number of identities per switch. **Note:** Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	ExtremeSwitching X435	100
Identity management—recommended number of ACL entries per identity. **Note:** Number of ACLs per identity, based on system ACL limitation.	ExtremeSwitching X435	20

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	ExtremeSwitching X435	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching X435	500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	ExtremeSwitching X435	2,500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching X435	12,500
IGMPv3 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X435	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching X435	1,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching X435	10,000
IP ARP entries in software—maximum number of IP ARP entries in software. **Note:** Might be limited by hardware capacity of FDB (maximum L2 entries).	ExtremeSwitching X435	20,424
IPv4 ARP entries in hardware with minimum LPM routes—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 X435	509 [h]
IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is "maximum."	ExtremeSwitching X435	500 [h]

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
IPv4 remote hosts in hardware with zero LPM routes—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 X435	3,100 [h]
IPv4 routes—maximum number of static IPv4 routes in software (combination of unicast and multicast routes).	ExtremeSwitching X435	32
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching X435	32
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	ExtremeSwitching X435	15
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	ExtremeSwitching X435	15
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching X435	500
IPv6 routes in software—maximum number of static IPv6 routes in software.	ExtremeSwitching X435	16
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching X435	16
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X435	30
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching X435	32
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching X435	30
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching X435	9,216

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. Note: • The internal lookup table configuration used is "l2-and-l3". • IPv6 and IPv4 L2 IPMC scaling is the same for this mode. • Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are the same.	ExtremeSwitching X435	5,000
Layer-3 IPv4 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). Note: • Limit value is the same for MVR senders, PIM Snooping entries. PIM SSM cache, IGMP senders, PIM cache. • Assumes source-group-vlan mode as look up key. • Layer 3 IPMC cache limit in mixed mode also has the same value.	ExtremeSwitching X435	1,500
Layer-3 IPv6 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). Note: • Limit value is the same for MLD sender per switch, PIM IPv6 cache. • Assumes source-group-vlan mode as lookup key.	ExtremeSwitching X435	700

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Load sharing—maximum number of load sharing groups. **Note:** 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.	ExtremeSwitching X435	8
Load sharing—maximum number of ports per load-sharing group.	ExtremeSwitching X435 (standalone only)	8
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching X435	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching X435	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching X435	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters.	ExtremeSwitching X435	512
Maximum mirroring instances.	ExtremeSwitching X435	1 (egress)
Mirroring (filters)—maximum number of mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	ExtremeSwitching X435	128
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	ExtremeSwitching X435	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching X435	1
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching X435	63

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	ExtremeSwitching X435	2,500
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching X435	12,500
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	ExtremeSwitching X435	2,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching X435	10,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X435	200
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching X435	1,024
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching X435	1,024
Network Login VLAN VSAs— maximum number of VLANs a client can be authenticated on at any given time.	ExtremeSwitching X435	10
Network Service Identifiers (NSI)/VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching X435	94
ONEPolicy Roles/Profiles— maximum number of policy roles/ profiles.	ExtremeSwitching X435	63
ONEPolicy Rules per Role/Profile —maximum number of rules per role/policy.	ExtremeSwitching X435	IPv4 Rules: 128 L2 Rules: 56
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch with TCI-Overwrite disabled. Note: The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X435	192

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port per switch with TCI overwrite disabled. **Note:** The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X435	187
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	ExtremeSwitching X435	184
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	ExtremeSwitching X435	128
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	ExtremeSwitching X435	56
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching X435	256 ^{O}
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching X435	32 ^{O}
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching X435	15
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. **Note:** This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	ExtremeSwitching X435	15

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching X435	15
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching X435	10,000
Spanning Tree (maximum STPDs) —maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching X435	16
Spanning Tree PVST+—maximum number of port mode PVST domains. **Note:** 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, on a switch that supports 256 PVST domains (maximum) and 4,096 STP ports (maximum), the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching X435	128
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching X435	16
Spanning Tree—maximum number of VLANs per MSTI. **Note:** Maximum number of 10 active ports per VLAN when all 100 VLANs are in one MSTI.	ExtremeSwitching X435	100
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching X435	256
Spanning Tree (802.1d domains) —maximum number of 802.1d domains per port.	ExtremeSwitching X435	1
Spanning Tree (number of ports) —maximum number of ports including all Spanning Tree domains.	ExtremeSwitching X435	1,024
Spanning Tree (maximum VLANs) —maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching X435	256

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	ExtremeSwitching X435	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching X435	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching X435	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching X435	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	ExtremeSwitching X435	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching X435	16 (local-only VRs)
Virtual router forwarding (VRFs)—maximum number of VRFs that can be created on a switch. **Note:** * Subject to other system limitations.	ExtremeSwitching X435	16 (local-only VRFs)
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	ExtremeSwitching X435	1,000
VLANs—includes all VLANs.	ExtremeSwitching X435	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching X435	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X435	IPv4: 30 IPv6: 15
VLANs (maximum active port-based)—maximum active ports per VLAN when 1,000 VLANs are configured with default license.	ExtremeSwitching X435	28
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X435	4,090

Table 9: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	ExtremeSwitching X435	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching X435	15
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN. **Note:** 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.	ExtremeSwitching X435	15
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching X435	15
VMAN CEP—maximum number of CVIDs.	ExtremeSwitching X435	192
XML requests—maximum number of XML requests per second. **Note:** Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	ExtremeSwitching X435	10 with 100 DACLs

Edge License Limits

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

Table 10: Supported Limits for Edge License

Metric	Product	Limit
AAA (local)—maximum number of admin and local user accounts.	All platforms, except X435	16
Access lists (meters)—maximum number of meters.	ExtremeSwitching X620, X440-G2	1,024 ingress 256 egress
	ExtremeSwitching X450-G2, X460-G2	1,024 ingress 512 egress
	ExtremeSwitching X590, X465	2,048 ingress 512 egress
	ExtremeSwitching X695	6,000 ingress 2,000 egress
Access lists (policies)—suggested maximum number of lines in a single policy file.	All platforms, except X435	300,000
Access lists (policies)—maximum number of rules in a single policy file.[a]	ExtremeSwitching X460-G2, X450-G2	4,096 ingress 1,024 egress
	ExtremeSwitching X620, X440-G2	2,048 ingress 512 egress
	ExtremeSwitching X590, X465, X695	8,192 ingress 1,024 egress
Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2, X590, X465	2,048 ingress only
	ExtremeSwitching X695	1,024 ingress only
	ExtremeSwitching X620, X440-G2	512 ingress only
Access lists (slices)—number of ACL slices.	ExtremeSwitching X460-G2, X450-G2	16 ingress 4 egress
	ExtremeSwitching X590, X465, X695	12 ingress 4 egress
	ExtremeSwitching X440-G2, X620	8 ingress 4 egress
Access lists (slices)—number of ACL slices in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2, X465, X620, X440-G2, X590, X695	4 ingress only
ACL Per Port Meters—number of meters supported per port.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16
ACL port ranges.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	32
Meters Packets-Per-Second Capable.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	Yes

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
AVB (audio video bridging)— maximum number of active streams.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2	1,024
	ExtremeSwitching X465, X695, X590	4,096
BFD sessions (Software Mode) —maximum number of BFD sessions.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695 (default timers—1 sec)	512
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695 (minimal timers—100 msec)	10 [c]
BFD IPv4 sessions (Hardware Assisted)—maximum number of IPv4 BFD sessions.	ExtremeSwitching X460-G2, X590, X465, X695	900 (PTP not enabled) 425 (PTP enabled) 256 (with 3 ms transmit interval)
BFD IPv6 sessions (Hardware Assisted)—maximum number of IPv6 BFD sessions.	ExtremeSwitching X460-G2, X590, X465, X695	425 (PTP not enabled)
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X465, X620, X590, X695	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	ExtremeSwitching X460-G2, 450-G2, X440-G2, X465, X620, X590, X695	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents	ExtremeSwitching X460-G2, X450-G2, X440-G2, X465, X620, X590, X695	4,000
Connectivity fault management (CFM)—maximum number or CFM domains. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	8
CFM—maximum number of CFM associations. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	256
CFM—maximum number of CFM up end points. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	32

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
CFM—maximum number of CFM down end points. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	32
	ExtremeSwitching X460-G2	256 (non-load shared ports) 32 (load shared ports)
CFM—maximum number of CFM remote end points per up/down end point. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	2,000
CFM—maximum number of dot1ag ports. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	128
CFM—maximum number of CFM segments. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	1,000
CFM—maximum number of MIPs. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	256
CLEAR-Flow—total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs.	ExtremeSwitching X460-G2, X450-G2	4,094
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X590, X465, X695	8,192
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)—maximum number of DCBX application TLVs.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	8
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	256 (with underlying protocol RIPng) 128 (with underlying protocol OSPFv3) 1,024 (with static routes)
DHCP snooping entries—maximum number of DHCP snooping entries.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	2,048

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Dynamic ACLs—maximum number of ACLs processed per second. **Note:** Limits are load-dependent.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695 with 50 DACLs with 500 DACLs	 10 5
EAPS domains—maximum number of EAPS domains. **Note:** An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains. **Note:** You can increase the number of domains by upgrading to the Advanced Edge license.	ExtremeSwitching X450-G2, X460-G2, X440-G2, X620, X590, X465, X695	4
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2-24T/P	1,000
	ExtremeSwitching X590, X465, X695	2,000
ERPS domains—maximum number of ERPS domains with or without CFM configured. **Note:** You can increase the number of domains by upgrading to the Advanced Edge license.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	4
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2-24T/P	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	2,000
	ExtremeSwitching X620, X440-G2-24T/P	500
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching X450-G2, X460-G2, X620, X590 , X465, X695	5,000
	ExtremeSwitching X440-G2-24T/P	4,000
Extended Edge Switching maximum BPEs—maximum number of attached bridge port extenders (BPEs).	ExtremeSwitching X465, X590	48

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs).	ExtremeSwitching X465, X590	2 on V400-24 and V300 models 4 on V400-48 models
Extended Edge Switching maximum tiers—maximum number of cascade levels (tiers) of bridge port extenders (BPEs).	ExtremeSwitching X465, X590	4 (except for V300-8P-2T-W, which support 1 tier)
Extended Edge Switching maximum ring BPEs—maximum number of bridge port extenders (BPEs) in a ring topology.	ExtremeSwitching X465, X590	8
Extended Edge Switching maximum VLANs—maximum number of VLANs - Includes all VLANs	ExtremeSwitching X465, X590	4,094
Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships.	ExtremeSwitching X465, X590	12,000 in hash mode (default) 131,000 in port-group mode
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X440-G2	6,460 pps
	ExtremeSwitching X450-G2	16,000 pps
	ExtremeSwitching X465	28,497 pps
	ExtremeSwitching X460-G2	17,000 pps
	ExtremeSwitching X590	18,162 pps
	ExtremeSwitching X620	6,968 pps
	ExtremeSwitching X695	34,813 pps
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching X460-G2	49,152[f]
	ExtremeSwitching X450-G2	34,816[f]
	ExtremeSwitching X620, X440-G2	16,384[f]
	ExtremeSwitching X590, X465	278,528[f]
	ExtremeSwitching X695	294,912 [f]
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	1,024
	ExtremeSwitching X590, X465, X695	4,096

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
FDB (maximum L2 entries)—maximum number of MAC addresses.	ExtremeSwitching X460-G2	98,300 [g]
	ExtremeSwitching X450-G2	68,000 [g]
	ExtremeSwitching X620, X440-G2	16,384
	ExtremeSwitching X590, X465, X695	278,528 [g]
	ExtremeSwitching X695	294,912 [g]
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching X590, X465, X695	4,096
	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2	1,024
Identity management—maximum number of Blacklist entries.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	512
Identity management—maximum number of Whitelist entries.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	512
Identity management—maximum number of roles that can be created.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	64
Identity management—maximum role hierarchy depth allowed.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	5
Identity management—maximum number of attribute value pairs in a role match criteria.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16
Identity management—maximum number of child roles for a role.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
Identity management—maximum number of LDAP servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
Identity management—maximum number of Kerberos servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	20
Identity management—maximum database memory size.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	512

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Identity management—recommended number of identities per switch. **Note:** Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	100
Identity management—recommended number of ACL entries per identity. **Note:** Number of ACLs per identity, based on system ACL limitation.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	20
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching X460-G2, X695	1,500
	ExtremeSwitching X450-G2	2,048
	ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X590, X465	4,000
IGMPv1/v2 SSM-map entries—maximum number of IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	500
IGMPv1/v2 SSM-map entries—maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	50
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	ExtremeSwitching X590, X465, X695, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X465, X590, X695	45,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	250

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X590, X465, X695	4,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X590, X465, X695	45,000
IP ARP entries in software—maximum number of IP ARP entries in software. Note: Might be limited by hardware capacity of FDB (maximum L2 entries).	ExtremeSwitching X460-G2	57,344 (up to)[h]
	ExtremeSwitching X450-G2	47,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	20,480
	ExtremeSwitching X590, X465	157,694 (up to)[h]
	ExtremeSwitching X695	184,318 (up to)[h]
IPv4 ARP entries in hardware with minimum LPM routes—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 X460-G2	50,000 (up to)[h]
	ExtremeSwitching X450-G2	39,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X590, X465	119,000 (up to)[h]
	ExtremeSwitching X695	146,000 (up to)[h]
IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is "maximum."	ExtremeSwitching X460-G2	43,000 (up to)[h]
	ExtremeSwitching X450-G2	29,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X590, X465	109,000 (up to)[h]
	ExtremeSwitching X695	125,000 (up to)[h]
IP flow information export (IPFIX)—number of simultaneous flows.	ExtremeSwitching X460-G2	2,048 ingress 2,048 egress
	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	N/A
IPv4 remote hosts in hardware with zero LPM routes—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 X460-G2	73,000[h]
	ExtremeSwitching X450-G2	61,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X590, X465	216,000 (up to)[h]
	ExtremeSwitching X695	241,000 (up to)[h]

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	25,000
	ExtremeSwitchingX590, X465, X695	131,000
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching X460-G2	12,000
	ExtremeSwitching X450-G2	16,000
	ExtremeSwitching X590, X465, X695	131,000 [q]
	ExtremeSwitching X620, X440-G2	480
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	255
	ExtremeSwitching X440-G2, X620	N/A
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	1 (per virtual router)
	ExtremeSwitching X440-G2, X620	N/A
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	255
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	2,048
	ExtremeSwitching X620, X440-G2	510
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching X460-G2,	22,000 [h]
	ExtremeSwitching X450-G2	12,000 [h]
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X590, X465	24,500 [s]
	ExtremeSwitching X695	57,000 [h]
IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2	25,000
	ExtremeSwitching X590, X465, X695	65,000 [q]
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching X460-G2	6,000
	ExtremeSwitching X450-G2	8,000
	ExtremeSwitching X590, X465, X695	65,000 [q]
	ExtremeSwitching X620, X440-G2	240

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv6 routes with a mask greater than 64 bits in hardware—maximum number of such IPv6 LPM routes in hardware.	ExtremeSwitching X590, X465, X695	8,192[r]
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X450-G2, X460-G2	2,048
IPv6 route sharing in hardware—route mask lengths for which ECMP is supported in hardware.	ExtremeSwitching X460-G2, X450-G2, X620	0–64 >64 single path only
	ExtremeSwitching X590, X465, X695	0–128[r]
	ExtremeSwitching X440-G2	Not supported
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2,X450-G2, X590, X465, X695	2,048
	ExtremeSwitching X620, X440-G2	510
IP multicast static routes—maximum number of permanent multicast IP routes.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	1,024
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	1,024
	ExtremeSwitching X620, X440-G2	480
IP route sharing (maximum gateways)—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.	ExtremeSwitching X460-G2, X450-G2, X620, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X440-G2	N/A

Table 10: 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.	ExtremeSwitching X460-G2, X450-G2 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	 1,022 1,022 510 254 126 62
	ExtremeSwitching X620 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	 126 126 126 126 62 30
	ExtremeSwitching X590, X465, X695 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64 Note: 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 *ExtremeXOS 32.3 User Guide*.	 4,094 4,094 2,046 1,022 510 254
	ExtremeSwitching if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	 2,046 2,046 2,046 1,022 510 254
	ExtremeSwitching X440-G2	N/A
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	255
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	9,216

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. **Note:** • The internal lookup table configuration used is "l2-and-l3". • IPv6 and IPv4 L2 IPMC scaling is the same for this mode. • Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are the same.	ExtremeSwitching X695 ExtremeSwitching X460-G2 ExtremeSwitching X450-G2 ExtremeSwitching X620, X440-G2 ExtremeSwitching X590, X465	73,000 24,000 14,000 5,000 67,000
Layer-3 IPv4 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). **Note:** • Limit value is the same for MVR senders, PIM Snooping entries. PIM SSM cache, IGMP senders, PIM cache. • Assumes source-group-vlan mode as look up key. • Layer 3 IPMC cache limit in mixed mode also has the same value.	ExtremeSwitching X460-G2 ExtremeSwitching X450-G2 ExtremeSwitching X620, X440-G2 ExtremeSwitching X590, X465 ExtremeSwitching X695	26,000 21,000 1,500 93,000 104,000
Layer-3 IPv6 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). **Note:** • Limit value is the same for MLD sender per switch, PIM IPv6 cache. • Assumes source-group-vlan mode as lookup key.	ExtremeSwitching X460-G2 ExtremeSwitching X450-G2 ExtremeSwitching X620, X440-G2 ExtremeSwitching X590, X465 ExtremeSwitching X695	14,000 10,000 700 48,000 52,000

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Load sharing—maximum number of load sharing groups. **Note:** 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.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	128
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2	8
	For standalone: ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	32
	For stacked: ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	64
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590 , X465, X695	2,048

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Maximum mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695 **Note:** 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. You can 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 **Note:** For stacks containing X620 or X440-G2, maximum supported egress mirror instances is 1.	1 (egress)
Mirroring (filters)—maximum number of mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	128
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
MLAG ports—maximum number of MLAG ports allowed.	ExtremeSwitching X695	61
	ExtremeSwitching X440-G2, X450-G2	51
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X620	15
	ExtremeSwitching X590	35
	ExtremeSwitching X465	55
	Stacking	480
MLAG peers—maximum number of MLAG peers allowed.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	2
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching X460-G2	768
	ExtremeSwitching X450-G2	508
	ExtremeSwitching X620, X440-G2	256
	ExtremeSwitching X590, X465, X695	1,500
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	ExtremeSwitching X450-G2, X460-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X590, X465, X695	4,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2, X620, X440-G2	10,000
	ExtremeSwitching X590, X465, X695	45,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	ExtremeSwitching X460-G2, X450-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X590, X465, X695	4,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2, X620, X440-G2	10,000
	ExtremeSwitching X590, X465, X695	45,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465 , X695	200
Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	500
	ExtremeSwitching X440-G2, X620	50
Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	50

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1,024
Network Login—maximum number of clients being authenticated with policy mode enabled with TCI overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465 ExtremeSwitching , X695 ExtremeSwitching X620, X440-G2	1,024 512 256
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695 ExtremeSwitching X440-G2, X620	2,000 1,024
Network Login VLAN VSAs—maximum number of VLANs a client can be authenticated on at any given time.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	10
Network Service Identifiers (NSI)/VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	94
Network Address Translation (NAT) VLANs—maximum number of NAT VLANs.	ExtremeSwitching X465, X590, X695,	4
Network Address Translation (NAT) Sessions—number of NAT sessions supported (non twice-NAT).	ExtremeSwitching X465, X590, ExtremeSwitchingX695	1,024 1,023
Node Alias—maximum number of entries per slot.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8,192
ONEPolicy Dynamic ACL Rules—maximum number of Dynamic ACLs supported via RADIUS VSA 232 per user in Access-List mode.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	64
ONEPolicy Roles/Profiles—maximum number of policy roles/profiles.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	63

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Rules per Role/ Profile—maximum number of rules per role/policy.	ExtremeSwitching X450-G2, X460-G2	IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256
	ExtremeSwitching X620, X440-G2	IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch)
	ExtremeSwitching X465, X590, X695	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465	1,024
	ExtremeSwitching X695	512
	ExtremeSwitching X620, X440-G2	256
	Stacking	Depends on the stack nodes, but the maximum is 65,535.
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch with TCI-Overwrite disabled. **Note:** The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X590, X465	24,576
	ExtremeSwitching X460-G2,, X695	12,288
	ExtremeSwitching X450-G2	6,144
	ExtremeSwitching X620, X440-G2	1,536
	Stacking	1,536–65,534
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port per switch with TCI overwrite disabled. **Note:** The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X450-G2	6,144
	ExtremeSwitching X460-G2, X695	12,288
	ExtremeSwitching X590, X465	24,576
	ExtremeSwitching X440-G2, X620	1,536
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port with only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465	1,024
	ExtremeSwitching X695	512
	ExtremeSwitching X620, X440-G2	256

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	ExtremeSwitching X450-G2, X460-G2	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X590, X465, X695	1,976
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	ExtremeSwitching X450-G2, X460-G2	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X590, X465, X695	512
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	ExtremeSwitching X450-G2, X460-G2	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X590, X465, X695	512
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2,	256
	ExtremeSwitching X590, X465, X695	512
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	ExtremeSwitching X450-G2, X460-G2	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X590, X465, X695	440
OnePolicy Maximum number of rules supported in AccessList mode—maximum number of rules in AcessList mode.	ExtremeSwitching X450-G2, X460-G2	3,000
	ExtremeSwitching X440-G2, X620	952
	ExtremeSwitching X695	3,512
	ExtremeSwitching X435	440
	ExtremeSwitching X590	4,024
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590 , X465 , X695	256 [o]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	32 [o]

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X695	71
	ExtremeSwitching X590, X465	31
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. **Note:** This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	ExtremeSwitching X460-G2, X590, X465, X695	1,024
	ExtremeSwitching X450-G2	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching X460-G2, X590, X465, X695	1,280
	ExtremeSwitching X450-G2	597
	ExtremeSwitching X440-G2, X620	255
PTP/1588v2 Clock Ports	ExtremeSwitching X460-G2	31 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X465, X620, X590, X695	N/A
PTP/1588v2 Clock Instances	ExtremeSwitching X460-G2	2 combinations: • Transparent clock + ordinary clock • Transparent clock + boundary clock
	ExtremeSwitching X440-G2, X465, X620, X590, X695	N/A
PTP/1588v2 Unicast Static Slaves	ExtremeSwitching X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X465, X620, X590, X695	N/A
PTP/1588v2 Unicast Static Masters	ExtremeSwitching X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X465, X620, X590, X695	N/A
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching X460-G2, X620, X440-G2, X590, X465, X695	10,000

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	ExtremeSwitchingX460-G2, X440-G2, X620, X590, X465, X695	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	256
	ExtremeSwitching X440-G2, X620	128
RIPng learned routes—maximum number of RIPng routes.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	3,000
	ExtremeSwitching X440-G2, X620	N/A
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching X450-G2, X460-G2, X620, X590, X465, X695	64
	ExtremeSwitching X440-G2	32
Spanning Tree PVST+—maximum number of port mode PVST domains. **Note:** 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, on a switch that supports 256 PVST domains (maximum) and 4,096 STP ports (maximum), the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching X620	256
	ExtremeSwitching X460-G2, X450-G2, X440-G2	128
	ExtremeSwitching X590, X465, X695	384
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching X450-G2, X460-G2, X620, X590, X465, X695	64
	ExtremeSwitching X440-G2,	32
Spanning Tree—maximum number of VLANs per MSTI. **Note:** Maximum number of 10 active ports per VLAN when all 500 VLANs are in one MSTI.	ExtremeSwitching X460-G2, X450-G2, X620, X590, X465, X695	600
	ExtremeSwitching X440-G2	256
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching X460-G2, X450-G2, X620, X590, X465, X695	1,024
	ExtremeSwitching X440-G2	512
Spanning Tree (802.1d domains)—maximum number of 802.1d domains per port.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	ExtremeSwitching X450-G2, X460-G2, X620, X590, X465, X695	4,096
	ExtremeSwitching X440-G2	2,048
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching X460-G2, X450-G2, X620, X590, X465, X695	1,024
	ExtremeSwitching X440-G2	600
SSH (number of sessions) —maximum number of simultaneous SSH sessions.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16
Telnet (number of sessions) —maximum number of simultaneous Telnet sessions.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	63
	ExtremeSwitching X440-G2, X620	16 (local-only VRs)
Virtual router forwarding (VRFs)—maximum number of VRFs that can be created on a switch. **Note:** * Subject to other system limitations.	ExtremeSwitching X460-G2,X450-G2, X590, X465, X695	960 *
	ExtremeSwitching X440-G2, X620	16 (local-only VRFs)
Virtual router protocols per VR —maximum number of routing protocols per VR.	ExtremeSwitching X460-G2,X450-G2, X590, X465, X695	8
	ExtremeSwitching X440-G2, X620	N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	ExtremeSwitching X460-G2,X450-G2, X590, X465, X695	64
	ExtremeSwitching X440-G2, X620	N/A
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1,000

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLANs—includes all VLANs. **Note:** Only 4,092 user-configurable VLANs are supported. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2,X450-G2, X590, X465, X695	2,048
	ExtremeSwitching X440-G2, X620	510
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X620	65,536
	ExtremeSwitching X465, X590, X695	131,585
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with the default license.	ExtremeSwitching X590 , X465, X695	32
	ExtremeSwitching X440-G2	28
	ExtremeSwitching X460-G2	26
	ExtremeSwitching X620	16
	ExtremeSwitching X450-G2	29
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X695	71
	ExtremeSwitching X590, X465	31

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN. **Note:** 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.	ExtremeSwitching X465, X590, X695	1,024
	ExtremeSwitching X450-G2	512
	ExtremeSwitching X620	510
	ExtremeSwitching X440-G2	255
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	2,046
	ExtremeSwitching X440-G2, X620	255
VMAN CEP—maximum number of CVIDs. **Note:** With 75% hash table utilization.	ExtremeSwitching X440-G2	1,500
	ExtremeSwitching X450-G2	6,000
	ExtremeSwitching X460-G2,	12,000
	ExtremeSwitching X590, X465	24,000
XML requests—maximum number of XML requests per second. **Note:** Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	10 with 100 DACLs
XNV authentication—maximum number of VMs that can be processed (combination of local and network VMs).	ExtremeSwitching X460-G2, X590, X465, X695	2,048
	ExtremeSwitching X450-G2, X440-G2, X620	1,024
XNV database entries—maximum number of VM database entries (combination of local and network VMs).	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	16,000
XNV database entries—maximum number of VPP database entries (combination of local and network VPPs).	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	2,048
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs /local VMs).	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	2,048
XNV local VPPs—maximum number of XNV local VPPs.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	2,048 ingress 512 egress

Table 10: Supported Limits for Edge License (continued)

Metric	Product	Limit
XNV policies/dynamic ACLs—maximum number of policies/dynamic ACLs that can be configured per VPP.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs. [p]	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	2,048 ingress 512 egress

Advanced Edge License Limits

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

Table 11: Supported Limits for Advanced Edge License

Metric	Product	Limit
BGP auto-peering—maximum number of auto-peering nodes and VTEPs.	ExtremeSwitching X590, X465, X695	64
BGP auto-peering attached IPv4 hosts— maximum number of attached IPv4 hosts.	ExtremeSwitching X590, X465, X695	64,000
BGP auto-peering attached IPv6 hosts— maximum number of attached IPv6 hosts.	ExtremeSwitching X590, X465, X695	8,000
BGP auto-peering ECMP—maximum number of equal cost multipath for auto-peering. Note: * Subject to the limitation imposed by the number of physical ports on a switch.	ExtremeSwitching X590, X465, X695	16*
BGP auto-peering maximum IPv4 prefixes with ECMP—Maximum number of IPv4 Network prefixes with ECMP.	ExtremeSwitching X590, X465, X695	64,000
BGP auto-peering maximum IPv6 prefixes with ECMP—Maximum number of IPv6 Network prefixes with ECMP.	ExtremeSwitching X590, X465, X695	8,000
BGP auto-peering MLAG peers—maximum MLAG peers per AutoBGP node.	ExtremeSwitching X590, X465, X695	1
BGP auto-peering VRFs—maximum number of VRFs.	ExtremeSwitching X590, X465, X695	64
BGP auto-peering EVPN instances—maximum EVPN instances.	ExtremeSwitching X590, X465, X695	1,024

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
EAPS domains—maximum number of EAPS domains. **Note:** An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains.	ExtremeSwitching X590, X465, X695	128
	ExtremeSwitching X450-G2, X460-G2	64
	ExtremeSwitching X440-G2, X620	32
EAPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X440-G2, X620	500
	ExtremeSwitching X590, X465, X695	2,000
ERPS domains—maximum number of ERPS domains without CFM configured.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	32
ERPS domains—maximum number of ERPS domains with CFM configured.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	32
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	2,000
	ExtremeSwitching X620, X440-G2	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	2,000
	ExtremeSwitching X620, X440-G2	500
ESRP groups—maximum number of ESRP groups	ExtremeSwitching X450-G2, X460-G2, X440-G2, X620, X590, X465, X695	32
ESRP domains—maximum number of ESRP domains.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	511
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	1
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch—maximum number of VCCV enabled VPLS VPNs.	ExtremeSwitching X460-G2, X590, X465, X695	16
	ExtremeSwitching X450-G2, X620, X440-G2	N/A

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
L2 VPN: VPLS MAC addresses—maximum number of MAC addresses learned by a switch.	ExtremeSwitching X590, X465, X695	140,000
	ExtremeSwitching X460-G2	55,000
	ExtremeSwitching X450-G2, X620, X440-G2	N/A
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	ExtremeSwitching X460-G2, X590, X465, X695	1,023
	ExtremeSwitching X450-G2, X620, X440-G2	N/A
L2 VPN: VPLS peers—maximum number of VPLS peers per VPLS instance.	ExtremeSwitching X460-G2, X590, X465, X695	64
	ExtremeSwitching X450-G2, X620, X440-G2	N/A
L2 VPN: LDP pseudowires—maximum number of pseudowires per switch.	ExtremeSwitching X460-G2, X590, X465, X695	7,000
	ExtremeSwitching X450-G2, X620, X440-G2	N/A
L2 VPN: static pseudowires—maximum number of static pseudowires per switch.	ExtremeSwitching X460-G2, X590, X465, X695	7,000
	ExtremeSwitching X450-G2, X620, X440-G2	N/A
L2 VPN: Virtual Private Wire Service (VPWS) VPNs—maximum number of virtual private networks per switch.	ExtremeSwitching X590, X465, X695	4,090
	ExtremeSwitching X460-G2	1,023
	ExtremeSwitching X450-G2, X620, X440-G2	N/A
MPLS RSVP-TE interfaces—maximum number of interfaces.	ExtremeSwitching X460-G2, X590, X465,, X695,	32
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	ExtremeSwitching X460-G2, X590,X695, X465	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	ExtremeSwitching X460-G2, X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	ExtremeSwitching X460-G2,	2,000
	ExtremeSwitching X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS RSVP-TE paths—maximum number of paths.	ExtremeSwitching X460-G2	1,000
	ExtremeSwitching X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	ExtremeSwitching X460-G2	1,000
	ExtremeSwitching X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	ExtremeSwitching X460-G2, X590, X465, X695	64
	ExtremeSwitching X450-G2, and ExtremeSwitching X440-G2, X620	N/A

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	ExtremeSwitching X460-G2, X590, X465, X695	128
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	ExtremeSwitching X460-G2	50
	ExtremeSwitching X590, X465, X695	64
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	ExtremeSwitching X460-G2, X590, X465, X695	2,048
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS LDP-enabled interfaces— maximum number of MPLS LDP configured interfaces per switch.	ExtremeSwitching X460-G2, X590, X465, X695	128
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	ExtremeSwitching X460-G2, X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch.	ExtremeSwitching X460-G2, X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS static egress LSPs— maximum number of static egress LSPs.	ExtremeSwitching X460-G2	7,116
	ExtremeSwitching X590, X465, X695	8,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS static ingress LSPs— maximum number of static ingress LSPs.	ExtremeSwitching X460-G2, X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
MPLS static transit LSPs— maximum number of static transit LSPs	ExtremeSwitching X460-G2, X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	64
	ExtremeSwitching X620	4
	ExtremeSwitching X440-G2	N/A
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X460-G2, X590, X465, X695	8
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 external routes— recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X590, X465, X695	10,000
	ExtremeSwitching X460-G2	5,000
	ExtremeSwitching X450-G2, 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 X590, X465, X695	2,000
	ExtremeSwitching X460-G2	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	1,000

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
OSPFv2 inter-vr or leaking routes—recommended maximum number of inter-vr routes contained in an OSPF LSDB.	ExtremeSwitching X590, X465, X695, X460-G2	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	1,000
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	4
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X590, X465, X695	400
	ExtremeSwitching X450-G2, X620, X440-G2	4
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X450-G2, X460-G2, X440-G2, X620, X590, X465, X695	4
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X590, X465, X695	100
	ExtremeSwitching X460-G2	50
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X590, X465, X695	32
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X590, X465, X695	100
	ExtremeSwitching X460-G2	16
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching X460-G2,X590, X465, X695	10,000
	ExtremeSwitching X450-G2, X440-G2, X620	1,200
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X590, X465, X695	4.000
	ExtremeSwitching X460-G2	3,000
	ExtremeSwitching X450-G2, X440-G2, X620	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620, X590, X465, X695	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X450-G2, X460-G2,X440-G2, X620, X590, X465, X695	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X460-G2, X590, X465, X695	16
	ExtremeSwitching X450-G2, X440-G2, X620	4
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X450-G2,X440-G2, X620, X590, X465, X695	4
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	180

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	5,000
	ExtremeSwitching X440-G2, X620	1,500
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X450-G2,X440-G2, X620, X590 , X465, X695	4
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X590 , X465, X695	1,750
	ExtremeSwitching X450-G2	1,500
	ExtremeSwitching X440-G2, X620	550
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590 , X465, X695	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590 , X465, X695	32
Port-specific VLAN tags—maximum number of port-specific VLAN tags.	ExtremeSwitching X460-G2, X590 , X465	1,023
	ExtremeSwitching X450-G2, X440-G2, X620, X695	N/A
Port-specific VLAN tags—maximum number of port-specific VLAN tag ports.	ExtremeSwitching X460-G2, X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695	N/A
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X460-G2	65,536
	ExtremeSwitching X465, X590, X695	131,585

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
VRRP (v2/v3-IPv4) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs): ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	 511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups): ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	 2,048
	ExtremeSwitching X440-G2, X620	128
VRRP (v3-IPv6) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge or Base license, or higher. (VRRP-VRRPv3-IPv6) Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs): ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	 511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups): ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	 2,048
	ExtremeSwitching X440-G2, X620	128
VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch.	ExtremeSwitching X460-G2, X450-G2 X440-G2, X620, X590, X465, X695 Note: With Advanced Edge license or higher.	255
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN.	ExtremeSwitching X460-G2, X450-G2 X440-G2, X620, X590, X465, X695 Note: With Advanced Edge license or higher.	255
VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695 Note: With Advanced Edge license or higher.	8
VRRP (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8 (20 centisecond or 1 second hello interval)

Table 11: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
VRRP (v3-IPv6) (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8 (20 centisecond or 1 second hello interval)
VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)—maximum number of IP route tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
VRRP (v2/v3-IPv4/IPv6)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, X590, X465, X695	8
VXLAN—maximum virtual networks. **Note:** Every VPLS instance/PSTag VLAN reduces this limit by 1. **Note:** 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.	ExtremeSwitching X590, X465, X695 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	2,048–4,000 N/A
VXLAN—maximum tenant VLANs plus port combinations **Note:** Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	ExtremeSwitching X590, X465, X695 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	4,096 N/A
VXLAN—maximum static MAC to IP bindings. **Note:** Every FDB entry configured reduces this limit by 1.	ExtremeSwitching X590, X465, X695 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	64,000 N/A
VXLAN—maximum RTEP IP addresses	ExtremeSwitching X590, X465, X695 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	512 N/A
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	ExtremeSwitching X590, X465, X695 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	4,000 N/A
VXLAN—or replicator role, maximum number of attached leafs per switch.	ExtremeSwitching X465, X590, X695	256

Core License Limits

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

Table 12: Supported Limits for Core License

Metric	Product	Limit
Anycast RP Using PIM—maximum number of IPv4 Anycast RP set per VR.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X620, X590, X465, X695	32
Anycast RP Using PIM—maximum number of IPv6 Anycast RP set per VR.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X620, X590, X465, X695	32
Anycast RP Using PIM—RP peers per Anycast RP set.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X620, X590, X465, X695	10
BGP (aggregates)—maximum number of BGP aggregates.	ExtremeSwitching X460-G2, X590, X465, X695	256
	ExtremeSwitching X450-G2	204
BGP (networks)—maximum number of BGP networks.	ExtremeSwitching X460-G2, X590, X465, X695	1,024
	ExtremeSwitching X450-G2	820
BGP (peers)—maximum number of BGP peers. **Note:** With default keepalive and hold timers. **Note:** Each BGPv4/BGPv6 peer handles a maximum of 50 routes. **Note:** ECMP should not be enabled for BGP.	ExtremeSwitching X460-G2	128
	ExtremeSwitching X590, X465, X695	300
	ExtremeSwitching X450-G2	100
BGP (peer groups)—maximum number of BGP peer groups.	ExtremeSwitching X460-G2, X590, X465, X695	64
	ExtremeSwitching X450-G2	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	ExtremeSwitching X460-G2, X590, X465, X695	256
	ExtremeSwitching X450-G2	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	ExtremeSwitching X460-G2, X590, X465, X695	1,024
	ExtremeSwitching X450-G2	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	ExtremeSwitching X460-G2, X590, X465, X695	25,000
	ExtremeSwitching X450-G2	20,000
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	ExtremeSwitching X460-G2, X590, X465, X695 (at default)	25,000
	ExtremeSwitching X590, X465 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2	20,000

Table 12: Supported Limits for Core License (continued)

Metric	Product	Limit
BGP (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, X590, X465, X695	25,000
	ExtremeSwitching X450-G2	20,000
BGP ECMP—maximum number of equal cost paths per multipath for BGP and BGPv6.	ExtremeSwitching X460-G2, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X450-G2	64
BGPv6 (unicast address-family routes)—maximum number of unicast address family routes.	ExtremeSwitching X460-G2	6,000
	ExtremeSwitching X590, X465, X695	10,000
	ExtremeSwitching X450-G2	4,800
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2	18,000
	ExtremeSwitching X590, X465, X695	24,000
	ExtremeSwitching X450-G2	14,000
EVPN EVI instances—maximum number of EVI instances.	ExtremeSwitching X590, X465, X695	1,024
EVPN LAGs—maximum number of LAGs.	ExtremeSwitching X590, X465, X695	128
GRE Tunnels—maximum number of GRE tunnels.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	255
	ExtremeSwitching X620, X440-G2	N/A
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	ExtremeSwitching X460-G2, X590, X465, X695	128
	ExtremeSwitching X450-G2	N/A
IS-IS ECMP—maximum number of equal cost paths per multipath for IS-IS.	ExtremeSwitching X460-G2, X590, X465, X695	2, 4, or 8
	ExtremeSwitching X450-G2	N/A
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	ExtremeSwitching X460-G2, X590, X465, X695	255
	ExtremeSwitching X450-G2	N/A
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	ExtremeSwitching X460-G2, X590, X465, X695	256
	ExtremeSwitching X450-G2	N/A
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	ExtremeSwitching X460-G2, X590, X465, X695	20,000
	ExtremeSwitching 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.	ExtremeSwitching X460-G2, X590, X465, X695	25,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X590, X465, X695	25,000
	ExtremeSwitching X450-G2	N/A

Table 12: Supported Limits for Core License (continued)

Metric	Product	Limit
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.	ExtremeSwitching X460-G2, X590, X465, X695	20,000
	ExtremeSwitching 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.	ExtremeSwitching X460-G2, X590, X465, X695	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X590, X465, X695	10,000
	ExtremeSwitching 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.	ExtremeSwitching X460-G2, X590, X465, X695	10,000
	ExtremeSwitching 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.	ExtremeSwitching X460-G2, X590, X465, X695	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L2 routes in an L2 router—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.	ExtremeSwitching X460-G2, X590, X465, X695	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L1 routes in an L1/L2 router—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.	ExtremeSwitching X460-G2, X590, X465, X695	20,000
	ExtremeSwitching X450-G2	N/A
MSDP active peers—maximum number of active MSDP peers.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	64
MSDP SA cache entries—maximum number of entries in SA cache.	ExtremeSwitching X590, X465, X695	14,000
	ExtremeSwitching X450-G2	8,000
	ExtremeSwitching X460-G2	10,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X450-G2, X590, X465, X695	64

Table 12: Supported Limits for Core License (continued)

Metric	Product	Limit
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	8
OSPFv2 external routes— recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X590, X465, X695	10,000
	ExtremeSwitching X460-G2	5,000
	ExtremeSwitching X450-G2	4,000
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 X590, X465, X695	4,000
	ExtremeSwitching X460-G2	2,000
	ExtremeSwitching X450-G2	1,600
OSPFv2 inter-vr or leaking routes —recommended maximum number of inter-vr routes contained in an OSPF LSDB.	ExtremeSwitching X590, X465, X695, X460-G2	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	1,000
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X460-G2, X590, X465, X695	400
	ExtremeSwitching X450-G2	320
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X590, X465, X695	400
	ExtremeSwitching X450-G2	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X460-G2, X590, X465, X695	128
	ExtremeSwitching X450-G2	96
OSPFv2 routers in a single area— recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X590, X465, X695	100
	ExtremeSwitching X460-G2	50
	ExtremeSwitching X450-G2	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X590, X465, X695	32
	ExtremeSwitching X450-G2	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X590, X465, X695	100
	ExtremeSwitching X460-G2	16
	ExtremeSwitching X450-G2	12
OSPFv3 external routes— recommended maximum number of external routes.	ExtremeSwitching X460-G2, X590, X465, X695	10,000
	ExtremeSwitching X450-G2	7,500
OSPFv3 inter- or intra-area routes —recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X590, X465, X695	4.000
	ExtremeSwitching X460-G2	3,000
	ExtremeSwitching X450-G2	500

Table 12: Supported Limits for Core License (continued)

Metric	Product	Limit
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X460-G2, X590, X465, X695	256
	ExtremeSwitching X450-G2	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X460-G2, X590, X465, X695	64
	ExtremeSwitching X450-G2	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X460-G2, X590, X465, X695	16
	ExtremeSwitching X450-G2	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	255
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	255
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X590, X465, X695	1,750
	ExtremeSwitching X450-G2	1,500
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	64

Table 12: Supported Limits for Core License (continued)

Metric	Product	Limit
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X590, X465, X695	32

Notes for Limits Tables

[a] 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.

[c] When there are BFD sessions with minimal timer, sessions with default timer should not be used.

[f] Effective capacity varies based on actual MAC addresses and VLAN IDs used and hash algorithm selected.

[g] Based on "configure forwarding internal-tables more l2".

[h] Based on "configure forwarding internal-tables more l3-and-ipmc".

[j] The limit depends on setting configured with configure iproute reserved-entries.

[m] 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.

[n] If IGMP and MLD are simultaneously configured on the switch, the number of effective subscribers supported are lessened accordingly.

[o] The total of all PBR next hops on all flow redirects should not exceed 4,096.

[p] The number of XNV authentications supported based on system ACL limitations.

[q] Based on "configure forwarding internal-tables more routes".

[r] Based on `configure forwarding internal-tables more routes ipv6-mask-length 128`.

[s] Based on `configure forwarding internal-tables more l3-and-ipmc` or `configure forwarding internal-tables l2-and-l3`.

Open Issues, Known Behaviors, and Resolved Issues

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

Open Issues

There are no open issues in this release.

Known Behaviors

The following is a list of limitations in ExtremeXOS system architecture that have yet to be resolved.

Table 13: Known Issues, Platform-Specific, and Feature Change Requests (CRs)

Defect Number	Description
ExtremeSwitching X435 Series Switches	
EXOS-32881	On the ExtremeSwitching X435-8p-4s switch, downgrading from version 31.7 to 30.7 can render the PoE permanently inoperable, resulting in an RMA being needed to recover PoE functionality.
EXOS-32968	On the ExtremeSwitching X435 series switch, if Fast PoE is enabled and the switch is rebooted (not power-cycled), the switch behaves like perpetual PoE (PoE power delivery on the ports are not interrupted during the reboot).

Resolved Issues in ExtremeXOS 32.3

The following issues were resolved in ExtremeXOS 32.3. Version 32.3 includes all fixes up to and including the following versions: 11.6.5.3 and earlier, 12.0.5, 12.1.7, 12.2.2-patch1-12, 12.3.6, 12.4.5, 12.5.5, 12.6.3, 12.6.5, 12.7.1, 15.1.5, 15.2.4, 15.3.3, 15.4.1, 15.5.1, 15.5.2, 15.6.1, 15.6.2, 15.7.1, 16.1, 16.1.2, 16.1.3, 21.1, 22.1,

22.2, 22.3, 22.4, 22.5, 22.6, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 31.1, 31.2, 31.3, 31.4, 31.5, 31.6, 31.7, 32.1, and 32.2. For information about those fixes, see the release notes for the specific release.

Table 14: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 32.3

Defect Number	Description
General	
EXOS-30265	SNMP query on pethPsePortIndex is returning both slot and port information instead of just the port value.
EXOS-31801	Error messages are logged after an upgrade or switch rescue.
EXOS-31968	The outer tag was removed when sending LLDP frames over L2PT.
EXOS-32032	Incorrect values are returned for Tx and Rx power sensor states when polled via SNMP.
EXOS-32042	The error message "Failed to set port dot1p 8" is displayed in the log.
EXOS-32120	The operating system sends a double authentication request for the same client on ab LLDP-enabled port.
EXOS-32187	Edge-Safeguard blocked an MLAG port when the MLAG device reboots, with no signs of a loop.
EXOS-32222	ExtremeCloud IQ - Site Engine raises an alarm if a file named EXTRTEST exists with the TFTP server.
EXOS-32264	ARP packets are not sent via the Standby slot when starting the stack with ports disabled.
EXOS-32327	SLPP Guard not disabling the ports if CPU congestion is present.
EXOS-32538	ACL process crash occurs when adding an L2PT profile in VPLS.
EXOS-32580	HAL signal 11 crash occurs.
EXOS-32603	Netlogin web-based URL redirection doesn't work when HTTP is disabled and HTTPS is enabled.
EXOS-32614	The IP address is reversed in the SNMP response message.
EXOS-32776	Switch unresponsive after upgrading from 30.7.1.1patch1-103 to 31.7.1.4 patch1-36 with ONEPolicy configured.
EXOS-32959	Transceiver RxPower values are displayed incorrectly in switch logs.
ExtremeSwitching X590 Series Switches	
EXOS-32453	An ELRP loop occurs on the port that was converted from a cascade to a non-cascade port.
ExtremeSwitching X690 Series Switches	
EXOS-32428	The FAN OID returns only the first fan serial number.