ExtremeXOS and Switch Engine Release Notes

Software Version 31.6

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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

- *ACL Solutions Guide*
- *ExtremeXOS 31.6 Command Reference Guide*
- *ExtremeXOS and Switch Engine 31.6 EMS Messages Catalog*
- *ExtremeXOS and Switch Engine 31.6 Feature License Requirements*
- *ExtremeXOS and Switch Engine 31.6 SNMP Traps Reference*
- *ExtremeXOS 31.6 User Guide*
- *ExtremeXOS Quick Guide*
- *ExtremeXOS Release Notes*
- *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*

Extreme Management Center or ExtremeCloud IQ - Site Engine Publications

- *Extreme Management Center User Guide*

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 and Switch Engine 31.6, which adds features and resolves software deficiencies.

New in this Release

Beginning with this release, the names of the network operating systems have changed on the Universal hardware. ExtremeXOS (EXOS) has been renamed to Switch Engine and VSP Operating System Software (VOSS) has been renamed to Fabric Engine.

The following platforms support Switch Engine 31.6:

- ExtremeSwitching 5320 Series
- ExtremeSwitching 5420 Series
- ExtremeSwitching 5520 Series

> **Note**
> Upgrading the firmware from an older version of ExtremeXOS to Switch Engine 31.6 on the ExtremeSwitching 5420 and 5520 series will change the SNMP SysObjectID value. This change might affect SNMP-based management systems.

> **Note**
>
> For non-Universal Hardware switches, the names of the network operating systems will continue to be VSP Operating System Software (VOSS) and ExtremeXOS (EXOS).

New Hardware Supported in ExtremeXOS and Switch Engine 31.6

The following new hardware is supported in ExtremeXOS and Switch Engine 31.6:

Table 4: ExtremeSwitching 5320 Series Switches

ExtremeSwitching 5320-48T-8XE	48 10/100/1000BASE-T full/half duplex MACsec capable ports, 8 10G unpopulated SFP+ ports, and one AC PSU
ExtremeSwitching 5320-48P-8XE	48 10/100/1000BASE-T full/half duplex MACsec capable ports with 802.3at Type 2 PoE+ (30W), 8 10G unpopulated SFP+ ports, and one AC PSU
ExtremeSwitching 5320-24T-8XE	24 10/100/1000BASE-T full/half duplex MACsec capable ports, 8 10G unpopulated SFP+ ports, and one AC PSU
ExtremeSwitching 5320-24P-8XE	24 10/100/1000BASE-T full/half duplex MACsec capable ports with 802.3at Type 2 PoE+ (30W), 8 10G unpopulated SFP+ ports, and one AC PSU

A future release will add support for the following two models for Switch Engine, which are included in this document:

Table 5: ExtremeSwitching 5320 Series Switches

ExtremeSwitching 5320-16P-4XE	16 10/100/1000BASE-T full/half duplex MACsec capable ports with 802.3at Type 2 PoE+ (30W), 4 10G unpopulated SFP+ ports, and one AC PSU
ExtremeSwitching 5320-16P-4XE-DC	16 10/100/1000BASE-T full/half duplex MACsec capable ports with 802.3at Type 2 PoE+ (30W), 4 10G unpopulated SFP+ ports, and one DC PSU

Dual Network Operating System Information

All Universal Hardware switches can run two different network operating systems: Switch Engine (default, formerly EXOS) or Fabric Engine (formerly VOSS). When you power up the switch for the first time, you must select an operating system.

For more information about selecting a network operating system, or changing it after initial selection, see Changing the Network Operating System on page 17.

Security Information

The following section covers important security information for ExtremeXOS and Switch Engine 31.6.

Linux Kernel

ExtremeXOS and Switch Engine 31.6 use Linux Kernel 5.4 for ExtremeSwitching X465, X590, X690, X695, X870, 5320, 5420 and 5520 series switches, and Linux Kernel 4.14 for all other switches.

OpenSSL Version

ExtremeXOS and Switch Engine 31.6 use FIPS openssl-fips-2.0.16.

Upgrading ExtremeXOS and Switch Engine

For instructions about upgrading ExtremeXOS and Switch Engine software, see *Software Upgrade and Boot Options* in *ExtremeXOS 31.6 User Guide*.

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

Stacking: Upgrading from ExtremeXOS 30.2 and Earlier

You cannot automatically update a switch running ExtremeXOS 30.2 or earlier to ExtremeXOS 30.3 or later due to a file system compatibility issue. If a switch has ExtremeXOS 30.2 or earlier, prior to inserting the switch into the stack topology, you need to upgrade the switch manually:

1. To download and install a new image, the active partitions (primary or secondary) of all non-master nodes must match the active partition of the master node.
   a. To determine the active partition selected on all nodes and the ExtremeXOS versions installed in each partition, use the `show slot {`*slot* `{`**detail**`} |` **detail** `}` command with the **detail** option. If the node being upgraded is running on the primary partition, then the new image is downloaded and installed on the secondary partition.
   b. If the active partition is different on some nodes, the action you take depends on what is stored in both partitions:

   If both primary and secondary partitions have the same ExtremeXOS release, you can use the following commands to cause a node to use the same active image as the rest of the stack:

   ```
   use image {primary | secondary} slot slot-number
   reboot slot slot-number
   ```
2. Download a new ExtremeXOS software release and install it on all nodes on the active topology using the command: `download [`**url** *url* `{`**vr** *vrname*`} |` image `[`**active** `|` **inactive**`] [[`*hostname* `|` *ipaddress*`]` *filename* `{{`**vr**`}` *vrname*`} {`**block-size** *block_size*`}] {`*partition*`} {`**install** `{`**reboot**`}}`
3. Restart all nodes in the new release using `reboot {[`**time** *mon day year hour min sec*`] |` **cancel**`} {`**slot** *slot-number*`} {`**all**`}`

Newly Purchased Switches Require Software Upgrade

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

For information about upgrading the ExtremeXOS or Switch Engine software, see the *ExtremeXOS Upgrade Process* topic in the *Software Upgrade and Boot Options* chapter of the *ExtremeXOS 31.6 User Guide*.

Default ExtremeXOS and Switch Engine Settings

The following table shows the default settings for ExtremeXOS and Switch Engine starting with version 31.6.

Table 6: Default ExtremeXOS and Switch Engine Settings

Feature	31.6
1G behavior in 10G ports (5420 and 5520 series switches)	Autoneg OFF for port when 1G optic is inserted in a 10G port
Account Lockout	After 3 consecutive login failures, account is locked for 5 minutes.
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.
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
Identity Management	Disabled.
IGMP	Enabled, set to IGMPv2 compatibility mode.
IGMP Snooping	Enabled.
Image Integrity Check	Disabled.
IP Route Compression	Enabled.
ISIS	Disabled.
Log	Admin level privileges required to show log.
Logging memory buffer	Generate an event when the logging memory buffer exceeds 90% of capacity.

Table 6: Default ExtremeXOS and Switch Engine Settings (continued)

Feature	31.6
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.
PIM	Disabled.
PIM Snooping	Disabled.
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.
SSH	Disabled.
Stacking	—
Stacking auto-discovery	Enabled.
STP	Enabled.
Syslog	Disabled.
TACACS	Disabled.
Telnet	Disabled.
VPEX IP Multicast Replication	Controlling Bridge

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

Table 6: Default ExtremeXOS and Switch Engine Settings (continued)

Feature	31.6
VPLS	All newly created VPLS instances are enabled.
Watchdog	Enabled.
Web HTTP server	Disabled.

Image File Names

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

Table 7: Image Types (Prefixes)

Switches	Image File Type (Prefix)
ExtremeSwitching X465, X690, X695, X590, and X870	`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, X670-G2, X620	`summitX-` Example: `summitX-22.2.1.2.xos`

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

ExtremeSwitching 5320, 5420, 5520	`summit_arm` Example: `summit_arm-31.1.0.3.xos`

New and Corrected Features in ExtremeXOS and Switch Engine 31.6

This section lists the new and corrected features supported in the 31.6 software:

Distributed Denial of Service Support for ExtremeCloud IQ Agent

Distributed Denial of Service (DDoS) support for IQ Agent installs a filter on HTTPS L4 ports to set a CPU queue (QoS 5) that separates IQ Agent traffic from other IP exceptions. This new ACL redirects TCP traffic with source port 443 (default HTTPS port) to CPU queue 5. The IQ Agent system ACL is installed or uninstalled along with the L3 Unicast Miss (L3UCMiss) filter.

Supported Platforms

ExtremeSwitching 5320, 5420, and 5520 series switches.

Limitations

Outside of the supported platforms, you can manually install the ACL to redirect IQ Agent traffic to CPU queue 5 on smaller switches with 8 ACL slices (for example, X440-G2, X435, X620) by running the following command:

```
# configure access-list iqagent.pol any

iqagent.pol:
entry iqagent_cpu5 {
  if {
    protocol tcp;
    source-port 443;
  } then {
    traffic-queue cpu_q_5;
  }
}
```

Stack Rolling Software Upgrade

A Stack Rolling Software Upgrade (Rolling Upgrade) enables a stack to continue functioning during a software upgrade. The benefit of a Rolling Upgrade is minimal impact to the devices connected via a LAG or other multi-homing technologies that allow a device to be simultaneously connected to different stack nodes. Performing a Rolling Upgrade does not change the current method of installing software, only how the stack is rebooted.

The Rolling Upgrade process reboots all the Standby nodes, reboots the Backup node, and then initiates a failover to make the old Backup node the new Primary. The failover results in the old Primary node rebooting. Because the selected software version on each node is the newer, upgraded software version, after each node reboots, it will run the new software version.

Supported Platforms

ExtremeSwitching X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5320, 5420, and 5520 series switches.

Changed CLI Command

The **rolling** option is added to the **reboot** command.

Link Layer Discovery Protocol (LLDP) Redundancy Supported on Stacking

The Link Layer Discovery Protocol (LLDP) allows stations attached to a 802 LAN to advertise, to other stations attached to the same 802 LAN, the major capabilities provided by the system incorporating that station, the management address or addresses of the entity or entities that provide management of those capabilities, and the identification of the station's point of attachment to the 802 LAN required by those management entity or entities.

ExtremeXOS and Switch Engine 31.6 introduces active redundancy support for LLDP on stacking.

LLDP information (for example, LLDP neighbors, Fabric Attach elements and assignments) is continuously synchronized from the primary to the backup nodes. In case of failover, the backup becomes the primary node, with all existing LLDP information retained. Existing LLDP and Fabric

Attach neighbors are not re-learned. Because Fabric Attach assignments are retained, there is no impact on the traffic during failover.

> **Note**
> Statistics information is not synchronized to the backup. LLDP and Fabric Attach statistics start from empty on failover.

Supported Platforms

ExtremeSwitching X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5320, 5420, and 5520 series switches.

IP Maximum Transmission Unit Configuration Added to GRE Tunnel

Starting with ExtremeXOS and Switch Engine 31.6, GRE tunnel supports IP Maximum Transmission Unit (MTU) configuration.

When the IP packet size exceeds the configured IP MTU value on a tunnel, the Path MTU (PMTU) mechanism can be used to notify the sender of the traffic that the packet size needs to be reduced.

Supported Platforms

ExtremeSwitching X590, X690, X695, and X465 series switches.

New CLI Command

```
configure tunnel tunnel_name ip mtu mtu
```

TCP Maximum Segment Size Adjustment Added to GRE Tunnel

Starting with ExtremeXOS and Switch Engine 31.6, GRE tunnel supports TCP Maximum Segment Size (MSS) adjustment.

Turning on the TCP MSS adjustment on a GRE tunnel redirects TCP SYN and SYN ACK packets going into the GRE tunnel to the Control Protocol (CP) via the ACL implemented on fastpath. When passing the IP stack on CP, the netfilter rule is applied to those packets. If the TCP MSS value in the option is greater than the configured adjustment, the TCP MSS option value is rewritten to the configured one. However, if the option value is less than the configured value, there is no change. Doing this helps avoid end-to-end over GRE tunnel application failure.

When the TCP MSS adjustment is turned off, there is no interference on TCP SYN and SYN ACK packets going to the GRE tunnel because the ACL is removed. Those packets are fastpath forwarded.

Supported Platforms

ExtremeSwitching X450-G2, X460-G2, X465, X590, X670-G2, X690, X870, 5320, 5420, 5520 series switches.

New CLI Command

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

Changing the Network Operating System

ExtremeSwitching Universal Hardware switches can run two different operating systems: Switch Engine (formerly EXOS) (default) or Fabric Engine (formerly VOSS).

Making Your Initial Network Operating System Selection

You can make your initial selection of the operating system using:

- **ExtremeCloud™ IQ** (see ExtremeCloud IQ Agent Support on page 18)—You can select your network operating system when purchasing your switch, which associates the switch serial number with your desired network operating system, which then causes the desired network operating system to be loaded during ExtremeCloud onboarding. For more information about using ExtremeCloud IQ, go to https://www.extremenetworks.com/support/documentation/extremecloud-iq/.
- **Extreme Management Center**— see *Extreme Management Center User Guide*
- **Manually during boot-up**:
  - ◦ **Bootloader**—When the message `Starting Default Bootloader ...`Press and hold the `<spacebar> to enter the bootrom` appears, press and hold the **space bar** until the boot menu appears (you have 30 seconds):

    ```
    *** 5320-48T-8XE Boot Menu ( 3.4.2.8 ) ***

        EXOS: Default
        EXOS: Primary 31.6..
        EXOS: Secondary 31.6..
        EXOS: Primary 31.6.. with default configuration
        EXOS: Secondary 31.6.. with default configuration
        EXOS: Rescue
        Change the switch OS to VOSS
        Run Manufacturing Diagnostics
        Update bootloader
        Reboot system
    ```

    Use the **up** and **down** arrow keys to select `Change the switch OS to VOSS`, and then press **Enter**.
  - ◦ **Safe defaults mode start-up menu**—When the question `Would you like to change the switch OS to VOSS? [y/N/q]` appears:
    - ▪ For Switch Engine, type `N`.
    - ▪ For Fabric Engine, type `y`.

  Continue to log onto the switch. For more information about logging onto the switch, see the *ExtremeXOS 31.6 User Guide*.

Changing Your Network Operating System

You can change your network operating system selection at any time.

> ⚠️ **Caution**
> Changing your network operating systems deletes all configuration files, debug information, logs, events, and statistics information of the previous network operating system.

> **Note**
> If you anticipate ever changing the operating system to Fabric Engine, and you want to statically assign IP addresses on the DHCP server, then it is recommended to assign them based on the DHCP client ID. For more information about this issue, see the *Using a BOOTP or DHCP Server* topic in the *ExtremeXOS 31.6 User Guide*.

- **ExtremeCloud IQ**—See https://www.extremenetworks.com/support/documentation/extremecloud-iq/
- **Extreme Management Center**—See *Extreme Management Center User Guide*
- **CLI Command**—run the `download` [**url** *url* {**vr** *vrname*} | image [**active** | **inactive**] [[*hostname* | *ipaddress*] *filename* {{**vr**} *vrname*} {**block-size** *block_size*}] {*partition*} {**install** {**reboot**}} command specifying a VOSS image.

> **Note**
> Do *not* use the **active**, **inactive**, and **partition** options. They are not applicable for Fabric Engine.

ExtremeCloud IQ Agent Support

ExtremeXOS and Switch Engine 31.6 support 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.

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

Table 8: Supported Platforms (continued)

Switch Series	Switch Models
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
ExtremeSwitching 5320	5320-48T-8XE 5320-48P-8XE 5320-24T-8XE 5320-24P-8XE 5320-16P-4XE* 5320-16P-4XE-DC*
ExtremeSwitching 5420	5420F-8W-16P-4XE 5420F-24P-4XE 5420F-24S-4XE 5420F-24T-4XE 5420F-16MW-32P-4XE 5420F-16W-32P-4XE 5420F-48P-4XE 5420F-48P-4XL 5420F-48T-4XE 5420M-24T-4YE 5420M-24W-4YE 5420M-16MW-32P-4YE 5420M-48T-4YE 5420M-48W-4YE
ExtremeSwitching 5520	5520-24T 5520-24W 5520-48T 5520-48W 5520-12MW-36W 5520-24X 5520-48SE

* - Available in a future release

Extreme Hardware/Software Compatibility and Recommendation Matrices

Summit, ExtremeSwitching, and E4G Components: ExtremeXOS 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 EXOS releases for EXOS-based hardware platforms, see *ExtremeXOS Release Recommendations*.

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

Compatibility with Extreme Management Center or ExtremeCloud IQ - Site Engine and ExtremeCloud™ IQ - Site Engine

ExtremeXOS 31.6 is compatible with the version of Extreme Management Center or ExtremeCloud IQ - Site Engine shown in this table: http://emc.extremenetworks.com/content/common/releasenotes/extended_firmware_support.htm

Switch Engine 31.6 is compatible with ExtremeCloud IQ - Site Engine version 22.3 or later. Older versions (including Extreme Management Center) will not recognize devices running Switch Engine.

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 31.6 User Guide*.

Tested Third-Party Products

The following third-party products have been tested for ExtremeXOS and Switch Engine 31.6.

Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS

Tested Third-Party Clients

The following third-party clients are fully tested:

- Windows 7
- Windows Vista

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

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 and Switch Engine 31.6.

Limits Overview

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

- Value Edge License Limits on page 24
- Edge and Base License Limits on page 36
- Advanced Edge and Base License Limits on page 68
- Core and Premier License Limits on page 76

The ExtremeSwitching family of switches includes two categories of switches with different license levels:

Switch Category	Switches	Applicable License Levels
Non-universal switches	X435 *, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870	Value Edge *, Edge, Advanced Edge, Core
Universal hardware switches	5320, 5420, 5520	Base, Premier
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.
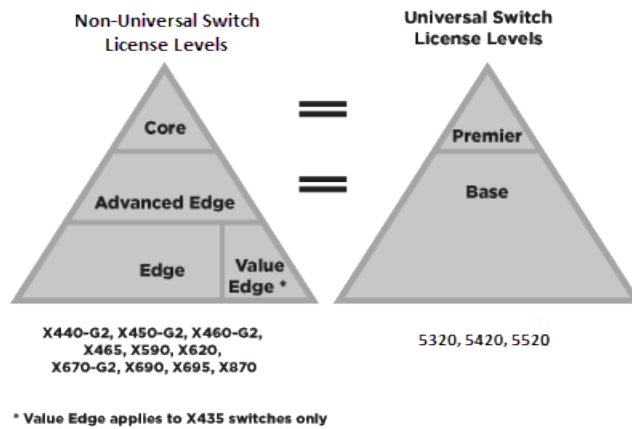
Figure 1: License Levels for non-Universal and Universal Switches

The non-universal and universal switch license levels correlate in the following way:

Premier = Core

Base = Advanced Edge + AVB

For more information about licenses, see *ExtremeXOS and Switch Engine 31.6 Feature License Requirements*.

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

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

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

In the Extended Edge Switching architecture, Layer-2, Layer-3, and multicast packet forwarding and filtering operations take place on the controlling bridge. The controlling bridge switch and attached BPEs (V400 Virtual Port Extenders) constitute a single, extended switch system. Therefore, the Extended Edge Switching system assumes the scale and limits from the specific controlling bridge model (for example, Extended Edge Switching X670-G2 series switches) 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 [g]

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

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

Metric	Product	Limit
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching X435	63
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

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

Metric	Product	Limit
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
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

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

Metric	Product	Limit
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
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, ExtremeSwitching X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	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

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

Metric	Product	Limit
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
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

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

Metric	Product	Limit
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
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 and Base License Limits

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

Table 10: Supported Limits for Edge and Base 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 X670-G2, X450-G2, X460-G2	1,024 ingress 512 egress
	ExtremeSwitching X870, X690, X590, X465	2,048 ingress 512 egress
	ExtremeSwitching X695	6,000 ingress 2,000 egress
	ExtremeSwitching 5320	2,048
	ExtremeSwitching 5420	3,000 ingress 1,024 egress
	ExtremeSwitching 5520	6,144 ingress 512 egress
Access lists (policies)—suggested maximum number of lines in a single policy file.	All platforms, except X435	300,000
	ExtremeSwitching 5320, 5420, 5520	N/A

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Access lists (policies)—maximum number of rules in a single policy file. [a]	ExtremeSwitching X460-G2, X450-G2, X670-G2	4,096 ingress 1,024 egress
	ExtremeSwitching X620, X440-G2	2,048 ingress 512 egress
	ExtremeSwitching X870	3,072 ingress 1,024 egress
	ExtremeSwitching X690, X590, X465, X695	8,192 ingress 1,024 egress
	ExtremeSwitching 5320-48T/P	8,192 ingress 1,024 egress
	ExtremeSwitching 5320-24T/P, 5320-16P	8,192 ingress 512 egress
	ExtremeSwitching 5420M	18,000 (rules double-wide (160-bit)) ingress 36,000 (rules single-wide (80-bit, default)) ingress 1,024 egress
	ExtremeSwitching 5420F	8,000 (rules double-wide (160-bit)) ingress 16,000 (rules single-wide (80-bit, default)) ingress 1,024 egress
	ExtremeSwitching 5520	9,216 ingress 1,024 egress
Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2ExtremeSwitching, X590, X465, 5520	2,048 ingress only
	ExtremeSwitching X670-G2, X870, X690, X695, 5320-48T/P, 5420	1,024 ingress only
	ExtremeSwitching X620, X440-G2, 5320-24T/P, 5320-16P	512 ingress only
Access lists (slices)—number of ACL slices.	ExtremeSwitching X460-G2, X450-G2	16 ingress 4 egress
	ExtremeSwitching X670-G2, X690, X590, X465, X695	12 ingress 4 egress
	ExtremeSwitching X440-G2, X620	8 ingress 4 egress
	ExtremeSwitching X870	4 ingress 4 egress
	ExtremeSwitching 5320, 5420, 5520	18 ingress 4 egress

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Access lists (slices)—number of ACL slices in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X465, X620, X440-G2, X870, X690, X590, X695, 5320 , 5420, 5520	4 ingress only
ACL Per Port Meters—number of meters supported per port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695	16
	ExtremeSwitching 5320, 5420, 5520	2,048
ACL port ranges.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	32
Meters Packets-Per-Second Capable.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695	Yes
	ExtremeSwitching 5320, 5420, 5520	N/A
AVB (audio video bridging)—maximum number of active streams.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, 5320, 5420	1,024
	ExtremeSwitching X465, X670-G2, X695, X870, 5520, X690, X590	4,096
BFD sessions (Software Mode)—maximum number of BFD sessions.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520 (default timers—1 sec)	512
	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 (minimal timers—100 msec)	10 [c]
BFD IPv4 sessions (Hardware Assisted)—maximum number of IPv4 BFD sessions.	ExtremeSwitching X460-G2, X870, X690, 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, X870, X690, X590, X465, X695	425 (PTP not enabled)
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2 , X465, X620, X870, X690, X590, X695, 5320, 5420, 5520	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X465, X620, X870, X690, X590, X695, 5320, 5420, 5520	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2 , X465, X620, X870, X690, X590, X695, 5320, 5420, 5520	4,000

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Connectivity fault management (CFM)—maximum number or CFM domains. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
CFM—maximum number of CFM associations. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	256
CFM—maximum number of CFM up end points. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	32
CFM—maximum number of CFM down end points. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520 ExtremeSwitching X460-G2	32 256 (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, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,000
CFM—maximum number of dot1ag ports. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	128
CFM—maximum number of CFM segments. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,000
CFM—maximum number of MIPs. **Note:** With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	256

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
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, X670-G2, X450-G2	4,094
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X870	3,072
	ExtremeSwitching X690, X590, X465, X695, 5320, 5420	8,192
	ExtremeSwitching 5520	9,215
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)—maximum number of DCBX application TLVs.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695	2,048
	ExtremeSwitching 5320, 5420, 5520	2,050
Dynamic ACLs—maximum number of ACLs processed per second. Note: Limits are load-dependent.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520 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 X670-G2, X450-G2, X460-G2, X440-G2, X620, X870, X690, X590, X465, X695	4
	ExtremeSwitching 5320-24T/P, 5320-16P	32
	ExtremeSwitching 5320-48T/P, 5420, 5520	64
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, 5320-24T/P, 5320-16P	1,000
	ExtremeSwitching X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	2,000

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695	4
	ExtremeSwitching 5320, 5420, 5520	See Advanced Edge and Base License Limits on page 68
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	2,000
	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, 5320-24T/P, 5320-16P	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690 , X590, X465, X695, 5320-48T/P, 5420, 5520	2,000
	ExtremeSwitchingX620, X440-G2, 5320-24T/P, 5320-16P	500
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590 , X465, X695, 5320-48T/P, 5420, 5520	5,000
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	4,000
Extended Edge Switching maximum BPEs—maximum number of attached bridge port extenders (BPEs).	ExtremeSwitching X465, X590, X670-G2, X690, 5520	48
	ExtremeSwitching 5420	20
Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs).	ExtremeSwitching X465, X590, X670-G2, X690, 5420, 5520	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, X670-G2, X690, 5420, 5520	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, X670-G2, X690, 5420, 5520	8
Extended Edge Switching maximum VLANs—maximum number of VLANs - Includes all VLANs	ExtremeSwitching X465, X590, X670-G2, X690, 5520	4,094
	ExtremeSwitching 5420	1,024

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships.	ExtremeSwitching X465, X590, X670-G2, X690, 5520	12,000 in hash mode (default) 131,000 in port-group mode
	ExtremeSwitching 5420	8,750 in hash mode (default) 131,617 in port-group mode
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X870	19,000 pps
	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 X670-G2	9,714 pps
	ExtremeSwitching X690	17,000 pps
	ExtremeSwitching X695	34,813 pps
	ExtremeSwitching 5320-48P	19,142 pps
	ExtremeSwitching 5420F-48T	21,585 pps
	ExtremeSwitching 5520-24T	18,838 pps
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching X460-G2	49,152 [f]
	ExtremeSwitching X670-G2	294,912 [f]
	ExtremeSwitching X450-G2	34,816 [f]
	ExtremeSwitching X620, X440-G2	16,384 [f]
	ExtremeSwitching X870	139,264 [f]
	ExtremeSwitching X690, X590, X465	278,528 [f]
	ExtremeSwitching X695	294,912 [f]
	ExtremeSwitching 5320	32,000
	ExtremeSwitching 5420M ExtremeSwitching 5420F	65,536 32,768 [f]
	ExtremeSwitching 5520	114,688 [f]

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	1,024
	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching 5320	1,000
	ExtremeSwitching 5420	1,024
FDB (maximum L2 entries)—maximum number of MAC addresses.	ExtremeSwitching X460-G2	98,300 [g]
	ExtremeSwitching X670-G2	294,912 [g]
	ExtremeSwitching X450-G2	68,000 [g]
	ExtremeSwitching X620, X440-G2	16,384
	ExtremeSwitching X870	139,264 [g]
	ExtremeSwitching X690, X590, X465, X695	278,528 [g]
	ExtremeSwitching X695	294,912 [g]
	ExtremeSwitching 5320	32,000
	ExtremeSwitching 5420M	65,536
	ExtremeSwitching 5420F	32,768 [g]
	ExtremeSwitching 5520	114,688 [g]
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, 5320, 5420	1,024
Identity management—maximum number of Blacklist entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	512
Identity management—maximum number of Whitelist entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	512
Identity management—maximum number of roles that can be created.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	64
Identity management—maximum role hierarchy depth allowed.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	5
Identity management—maximum number of attribute value pairs in a role match criteria.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	16
Identity management—maximum number of child roles for a role.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
Identity management—maximum number of LDAP servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
Identity management—maximum number of Kerberos servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	20
Identity management—maximum database memory size.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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 X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching X460-G2, X870	1,500
	ExtremeSwitching X450-G2	2,048
	ExtremeSwitching X670-G2 , X695	2,000
	ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X690, X590, X465	4,000
	ExtremeSwitching 5320, 5420	1,500
	ExtremeSwitching 5520	2,500

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
IGMPv1/v2 SSM-map entries—maximum number of IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	500
IGMPv1/v2 SSM-map entries—maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	50
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	ExtremeSwitching X870, X690, X590, X465, X695 , X670-G2, X460-G2, X450-G2, 5320, 5420, 5520	4,000
	ExtremeSwitching X440-G2, X620	3,500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X460-G2, X450-G2, 5320, 5420, 5520	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X465, X870, X690, X590, X695	45,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching X670-G2, X460-G2, X450-G2, 5320, 5420, 5520	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690, X590, X465, X695	4,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2, 5320, 5420, 5520	20,000
	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690, X590, X465, X695	45,000

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
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 X670-G2	131,072 (up to) [h]
	ExtremeSwitching X460-G2	57,344 (up to) [h]
	ExtremeSwitching X450-G2	47,000 (up to) [h]
	ExtremeSwitching X440-G2, X620	20,480
	ExtremeSwitching X870	94,206 (up to) [h]
	ExtremeSwitching X690, X590, X465	157,694 (up to) [h]
	ExtremeSwitching X695	184,318 (up to) [h]
	ExtremeSwitching 5320, 5420, 5520	74,750 (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 X870	74,000 (up to) [h]
	ExtremeSwitching X460-G2	50,000 (up to) [h]
	ExtremeSwitching X670-G2	108,000 (up to) [h]
	ExtremeSwitching X450-G2	39,000 (up to) [h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590, X465	119,000 (up to) [h]
	ExtremeSwitching X695	146,000 (up to) [h]
	ExtremeSwitching 5320	16,000
	ExtremeSwitching 5420M models ExtremeSwitching 5420F models	21,000 12,000
	ExtremeSwitching 5520	60,000 [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 X870	64,000 (up to) [h]
	ExtremeSwitching X460-G2	43,000 (up to) [h]
	ExtremeSwitching X670-G2	98,000 (up to) [h]
	ExtremeSwitching X450-G2	29,000 (up to) [h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590, X465	109,000 (up to) [h]
	ExtremeSwitching X695	125,000 (up to) [h]
	ExtremeSwitching 5320	14,000
	ExtremeSwitching 5420M models ExtremeSwitching 5420F models	24,000 16,000
	ExtremeSwitching 5520	49,000 [h]

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
IP flow information export (IPFIX)—number of simultaneous flows.	ExtremeSwitching X460-G2	2,048 ingress 2,048 egress
	ExtremeSwitching X450-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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 X870	120,000 (up to)[h]
	ExtremeSwitching X460-G2	73,000[h]
	ExtremeSwitching X670-G2	176,000 (up to)[h]
	ExtremeSwitching X450-G2	61,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X690, X590, X465	216,000 (up to)[h]
	ExtremeSwitching X695	241,000 (up to)[h]
	ExtremeSwitching 5320	20,000
	ExtremeSwitching 5320-24T/P, 5320-16P	24,000
	ExtremeSwitching 5420M ExtremeSwitching 5420F	36,000 24,000[h]
	ExtremeSwitching 5520	102,000[h]
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
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	131,000
	ExtremeSwitching 5320, 5420, 5520	81,000
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching X460-G2, 5420	12,000
	ExtremeSwitching X450-G2	16,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	131,000[q]
	ExtremeSwitching X620, X440-G2	480
	ExtremeSwitching 5520	81,000[q]
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	255
	ExtremeSwitching X440-G2, X620	N/A
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	255

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048
	ExtremeSwitching X620, X440-G2	510
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching X670-G2	36,750 [h]
	ExtremeSwitching X460-G2, X870	22,000 [h]
	ExtremeSwitching X450-G2	12,000 [h]
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X690, X590, X465	24,500 [s]
	ExtremeSwitching 5320	6,000
	ExtremeSwitching 5420M models ExtremeSwitching 5420F models	12,000 6,000
	ExtremeSwitching 5520	18,000 [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 X670-G2, X690, X870, X590, X465, X695	65,000 [q]
	ExtremeSwitching 5320, 5420, 5520	18,000 [q]
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching X460-G2, 5420	6,000
	ExtremeSwitching X450-G2	8,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	65,000 [q]
	ExtremeSwitching X620, X440-G2	240
	ExtremeSwitching 5520	40,000 [q]
IPv6 routes with a mask greater than 64 bits in hardware—maximum number of such IPv6 LPM routes in hardware.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5520	8,192 [r]
	ExtremeSwitching 5320, 5420	256
	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, 5320, 5420, 5520	0–64 >64 single path only
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	0–128 [r]
	ExtremeSwitching X440-G2	Not supported

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695	2,048
	ExtremeSwitching X620, X440-G2	510
	ExtremeSwitching 5320-48T/P	1,533
	ExtremeSwitching 5320-24T/P, 5320-16P	509
	ExtremeSwitching 5420	1,533
	ExtremeSwitching 5520	2,048
IP multicast static routes—maximum number of permanent multicast IP routes.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,024
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X450-G2, X620, X870, X690, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching 5320, 5420, 5520	2, 4, or 8
	ExtremeSwitching X440-G2	N/A

Table 10: Supported Limits for Edge and Base 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 X670-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 1,022 1,022 510 254
	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 X690, 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 the *ExtremeXOS 31.6 User Guide*.	 4,094 4,094 2,046 1,022 510 254
	ExtremeSwitching X870 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8	 2,046 2,046 2,046

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
	if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	1,022 510 254
	ExtremeSwitching X440-G2	N/A
	ExtremeSwitching 5320	128 (if maximum gateways is 2) 128 (if maximum gateways is 4) 64 (if maximum gateways is 8)
	ExtremeSwitching 5420 **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 the *ExtremeXOS 31.6 User Guide*.	510 (if maximum gateways is 2) 254 (if maximum gateways is 4) 126 (if maximum gateways is 8)
	ExtremeSwitching 5520 **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 the *ExtremeXOS 31.6 User Guide*.	2046 (if maximum gateways is 2) 1022 (if maximum gateways is 4) 510 (if maximum gateways is 8)
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	255
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	9,216
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch—maximum number of VCCV enabled VPLS VPNs.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465	16
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A
L2 VPN: VPLS MAC addresses—maximum number of MAC addresses learned by a switch.	ExtremeSwitching X670-G2, X690, X590, X465	140,000
	ExtremeSwitching X460-G2	55,000
	ExtremeSwitching X870	65,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465	1,023
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A
L2 VPN: VPLS peers— maximum number of VPLS peers per VPLS instance.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465	64
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A
L2 VPN: LDP pseudowires— maximum number of pseudowires per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465	7,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A
L2 VPN: static pseudowires— maximum number of static pseudowires per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465	7,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A
L2 VPN: Virtual Private Wire Service (VPWS) VPNs— maximum number of virtual private networks per switch.	ExtremeSwitching X670-G2, X870, X690, X590, X465	4,090
	ExtremeSwitching X460-G2	1,023
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5320, 5420, 5520	N/A
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 X670-G2, X695	73,000
	ExtremeSwitching X460-G2	24,000
	ExtremeSwitching X450-G2	14,000
	ExtremeSwitching X620, X440-G2	5,000
	ExtremeSwitching X870	36,000
	ExtremeSwitching X690, X590, X465	67,000
	ExtremeSwitching 5320	32,000
	ExtremeSwitching 5420	64,000
	ExtremeSwitching 5520	32,768

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
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	26,000
	ExtremeSwitching X450-G2	21,000
	ExtremeSwitching X670-G2	77,500
	ExtremeSwitching X620, X440-G2	1,500
	ExtremeSwitching X870	52,000
	ExtremeSwitching X690, X590, X465	93,000
	ExtremeSwitching X695	104,000
	ExtremeSwitching 5320	8,000
	ExtremeSwitching 5420M	12,000
	ExtremeSwitching 5420F	6,000
	ExtremeSwitching 5520	43,000
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 X670-G2	30,000
	ExtremeSwitching X460-G2	14,000
	ExtremeSwitching X450-G2	10,000
	ExtremeSwitching X620, X440-G2	700
	ExtremeSwitching X870	18,000
	ExtremeSwitching X690, X590, X465	48,000
	ExtremeSwitching X695	52,000
	ExtremeSwitching 5320	4,000
	ExtremeSwitching 5420M	6,000
	ExtremeSwitching 5420F	3,000
	ExtremeSwitching 5520	21,500
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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	128

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2, 5320, 5420	8
	For standalone: ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	32
	For stacked: ExtremeSwitching X670-G2, X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	64
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	ExtremeSwitching X460-G2, X450-G2, X670-G2, X440-G2, X620, X870, X690, X590 , X465, X695, 5320, 5420, 5520	2,048

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Maximum mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, 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)
	ExtremeSwitching 5320, 5420, 5520	4 total, 2 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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	16

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
MLAG ports—maximum number of MLAG ports allowed.	ExtremeSwitching X670-G2, X690, X695	71
	ExtremeSwitching X440-G2, X450-G2	51
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X590,	35
	ExtremeSwitching X465, 5320	55
	ExtremeSwitching 5420, 5520	59
MLAG peers—maximum number of MLAG peers allowed.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2
MPLS RSVP-TE interfaces— maximum number of interfaces.	ExtremeSwitching X460-G2, X670-G2, X590, X465,, X695, X870	32
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS RSVP-TE ingress LSPs— maximum number of ingress LSPs.	ExtremeSwitching X460-G2, X670-G2, X870, X590,X690, X695, X465	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS RSVP-TE egress LSPs— maximum number of egress LSPs.	ExtremeSwitching X460-G2, X670-G2, X870, X690 X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS RSVP-TE transit LSPs— maximum number of transit LSPs.	ExtremeSwitching X460-G2, X670-G2	2,000
	ExtremeSwitching X870, X690, X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS RSVP-TE paths— maximum number of paths.	ExtremeSwitching X460-G2	1,000
	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS RSVP-TE profiles— maximum number of profiles.	ExtremeSwitching X460-G2	1,000
	ExtremeSwitching X670-G2, X870, X690 X590, X465, X695	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
MPLS RSVP-TE EROs—maximum number of EROs per path.	ExtremeSwitching X460-G2, X670-G2, X870, X690 X590, X465, X695	64
	ExtremeSwitching X450-G2, and ExtremeSwitching X440-G2, X620, 5420, 5520	N/A
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465, X695	128
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	ExtremeSwitching X460-G2	50
	ExtremeSwitching X670-G2, X870, X690 X590, X465, X695	64
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465, X695	2,048
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465, X695	128
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS static egress LSPs—maximum number of static egress LSPs.	ExtremeSwitching X460-G2	7,116
	ExtremeSwitching X870, X690, X590, X465, X695, X670-G2	8,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
MPLS static ingress LSPs—maximum number of static ingress LSPs.	ExtremeSwitching X460-G2, X870, X690 X590, X465, X695	4,000
	ExtremeSwitching X670-G2	2,048
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
MPLS static transit LSPs—maximum number of static transit LSPs	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520	N/A
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching X460-G2, X670-G2, X870	768
	ExtremeSwitching X450-G2	508
	ExtremeSwitching X620, X440-G2	256
	ExtremeSwitching X690, X590, X465, X695, 5320, 5420	1,500
	ExtremeSwitching 5520	1,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	ExtremeSwitching X670-G2, X450-G2, X460-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590, X465, X695, 5320, 5420, 5520	4,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2, X620, X440-G2, 5320, 5420, 5520	10,000
	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X870, X690, X590, X465, X695	45,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	ExtremeSwitching X670-G2, X460-G2, X450-G2, 5320, 5420, 5520	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590, X465, X695	4,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X460-G2, X450-G2, X620, X440-G2, 5320, 5420, 5520	10,000
	ExtremeSwitching X870, X690, 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, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5320, 5420, 5520	200
Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	500
	ExtremeSwitching X440-G2, X620	50

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	50
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, 5320, 5420, 5520	1,024
	ExtremeSwitching X670-G2, X870, X690, X695	512
	ExtremeSwitching X620, X440-G2	256
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695	2,000
	ExtremeSwitching X440-G2, X620, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	10
Network Service Identifiers (NSI)/VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	94
Network Address Translation (NAT) VLANs—maximum number of NAT VLANs.	ExtremeSwitching X465, X590, X690, X695, X870	4
Network Address Translation (NAT) Sessions—number of NAT sessions supported (non twice-NAT).	ExtremeSwitching X465, X590, X690, X870	1,024
	ExtremeSwitchingX695	1,023
Node Alias—maximum number of entries per slot.	ExtremeSwitching X450-G2, X460-G2, X670-G2 X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X870, X690, X590, X465, X695, 5320, 5420, 5520	64
ONEPolicy Roles/Profiles—maximum number of policy roles/profiles.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	63

Table 10: Supported Limits for Edge and Base 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 X670-G2, X870	IPv6 Rules: 256 L2 Rules: 184 MAC Rules: 256 IPv4 Rules: 256
	ExtremeSwitching X620, X440-G2	IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch)
	ExtremeSwitching X465, X690, X590, X695, 5420	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440
	ExtremeSwitching 5320	IPv4 Rules: 1,024 IPv6 Rules: 0 MAC Rules: 0 L2 Rules: 952
	ExtremeSwitching 5520	4,024
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465, 5520	1,024
	ExtremeSwitching X670-G2, X690, X870, X695, 5320, 5420	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 X690, X590, X465	24,576
	ExtremeSwitching X670-G2, X460-G2, X870, X695	12,288
	ExtremeSwitching X450-G2	6,144
	ExtremeSwitching X620, X440-G2	1,536
	Stacking	1,536–65,534
	ExtremeSwitching 5320, 5420	768
	ExtremeSwitching 5520	9,216

Table 10: Supported Limits for Edge and Base 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 X450-G2	6,144
	ExtremeSwitching X460-G2, X670-G2, X870, X695	12,288
	ExtremeSwitching X690, X590, X465	24,576
	ExtremeSwitching X440-G2, X620	1,536
	ExtremeSwitching 5320, 5420	768
	ExtremeSwitching 5520	9,216
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, 5520	1,024
	ExtremeSwitching X670-G2, X870, X690, X695, 5320, 5420	512
	ExtremeSwitching X620, X440-G2	256
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, X670-G2, X870	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X690, X590, X465, X695, 5320, 5420	1,976
	ExtremeSwitching 5520	4,024
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, X670-G2, X870	256
	ExtremeSwitching X620, X440-G2, 5320	N/A
	ExtremeSwitching X690, X590, X465, X695, 5420	512
	ExtremeSwitching 5520	1,024
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870	256
	ExtremeSwitching X620, X440-G2, 5320	N/A
	ExtremeSwitching X690, X590, X465, X695, 5420	512
	ExtremeSwitching 5520	1,024
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, X670-G2, X620, X440-G2, X870	256
	ExtremeSwitching X690, X590, X465, X695, 5420	512
	ExtremeSwitching 5320, 5520	1,024

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
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, X670-G2, X870	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X690, X590, X465, X695, 5420	440
	ExtremeSwitching 5320, 5520	952
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5320, 5420, 5520	256 [O]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	32 [O]
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching X670-G2	63
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X690, X695	71
	ExtremeSwitching X590, X465	31
	ExtremeSwitching 5320, 5420, 5520	36
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 X670-G2, X460-G2, X870, X690, X590, X465, X695	1,024
	ExtremeSwitching X450-G2	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
	ExtremeSwitching 5320, 5420, 5520	960
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695	1,280
	ExtremeSwitching X450-G2	597
	ExtremeSwitching X440-G2, X620	255
	ExtremeSwitching 5320, 5420, 5520	960

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
PTP/1588v2 Clock Ports	ExtremeSwitching X460-G2, X670-G2	31 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695, 5320, 5420, 5520	N/A
PTP/1588v2 Clock Instances	ExtremeSwitching X670-G2, X460-G2	2 combinations: • Transparent clock + ordinary clock • Transparent clock + boundary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590 , X695, 5320, 5420, 5520	N/A
PTP/1588v2 Unicast Static Slaves	ExtremeSwitching X670-G2, X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590 , X695, 5320, 5420, 5520	N/A
PTP/1588v2 Unicast Static Masters	ExtremeSwitching X670-G2, X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695, 5320, 5420, 5520	N/A
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5320, 5420, 5520	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	ExtremeSwitching X670-G2, X460-G2, X440-G2, X620, X870, X690, X590 , X465 , X695, 5320, 5420, 5520	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	256
	ExtremeSwitching X440-G2, X620	128
RIPng learned routes—maximum number of RIPng routes.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	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, X670-G2, X460-G2, X620, X870, X690, X590 , X465, X695, 5320-48T/P, 5420, 5520	64
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	32

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
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, ExtremeSwitching X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching X670-G2, X620	256
	ExtremeSwitching X460-G2, X450-G2, X440-G2, 5320, 5420, 5520	128
	ExtremeSwitching X870, X690, X590 , X465, X695	384
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590 , X465, X695, 5320-48T/P, 5420, 5520	64
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	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 X670-G2	500
	ExtremeSwitching X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695, 5320-48T/P, 5420, 5520	600
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	256
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695, 5320-48T/P, 5420, 5520	1,024
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	512
Spanning Tree (802.1d domains)—maximum number of 802.1d domains per port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	1
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	4,096
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	2,048

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching X670-G2, X460-G2, X450-G2, X620, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	1,024
	ExtremeSwitching X440-G2, 5320-24T/P, 5320-16P	600
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	63
	ExtremeSwitching X440-G2, X620, 5320-24T/P, 5320-16P	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, X670-G2, X450-G2, X870, X690, X590 , X465, X695, 5320-48T/P, 5420, 5520	960 *
	ExtremeSwitching X440-G2, X620, 5320-24T/P, 5320-16P	16 (local-only VRFs)
Virtual router protocols per VR—maximum number of routing protocols per VR.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	8
	ExtremeSwitching X440-G2, X620, 5320-24T/P, 5320-16P	N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	64
	ExtremeSwitching X440-G2, X620, 5320-24T/P, 5320-16P	N/A

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,000
VLANs—includes all VLANs. **Note:** ExtremeXOS supports only 4,092 user-configurable VLANs. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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 5320	53,248
	ExtremeSwitching 5420	60,000
	ExtremeSwitching X465, X590, X670-G2, X690, X870, X695, 5520	131,585
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with the default license.	ExtremeSwitching X670-G2, X870, X690, X590 , X465, X695, 5520	32
	ExtremeSwitching 5320, 5420	3
	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, X670-G2, X620, X440-G2. X870, X690, X590 , X465, X695, 5320, 5420, 5520	16

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching X670-G2	63
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X870	127
	ExtremeSwitching X690, X695	71
	ExtremeSwitching X590, X465	31
	ExtremeSwitching 5320, 5420, 5520	36
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 X670-G2, X465, X870, X690, X590, X695	1,024
	ExtremeSwitching X450-G2	512
	ExtremeSwitching X620	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching 5320, 5420, 5520	960
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695	2,046
	ExtremeSwitching X440-G2, X620	255
	ExtremeSwitching 5320, 5520	960
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, X670-G2, X870	12,000
	ExtremeSwitching X590, X690, X465	24,000
	ExtremeSwitching 5320, 5420	768
	ExtremeSwitching 5520	9,000
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, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	10 with 100 DACLs

Table 10: Supported Limits for Edge and Base License (continued)

Metric	Product	Limit
XNV authentication—maximum number of VMs that can be processed (combination of local and network VMs).	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	16,000
XNV database entries— maximum number of VPP database entries (combination of local and network VPPs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs /local VMs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048
XNV local VPPs—maximum number of XNV local VPPs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048 ingress 512 egress
XNV policies/dynamic ACLs— maximum number of policies/ dynamic ACLs that can be configured per VPP.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs.[p]	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048 ingress 512 egress

Advanced Edge and Base License Limits

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

Table 11: Supported Limits for Advanced Edge and Base License

Metric	Product	Limit
BGP (peers)—maximum number of BGP peers.	ExtremeSwitching 5320, 5420, 5520	2
BGP auto-peering—maximum number of auto-peering nodes and VTEPs.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5320, 5420, 5520	64
BGP auto-peering attached IPv4 hosts— maximum number of attached IPv4 hosts.	ExtremeSwitching X670-G2	16,000
	ExtremeSwitching X870, X690, X590, X465, X695, 5320, 5420, 5520	64,000
BGP auto-peering attached IPv6 hosts— maximum number of attached IPv6 hosts.	ExtremeSwitching X670-G2	254
	ExtremeSwitching X870, X690, X590, X465, X695, 5320, 5420, 5520	8,000

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

Metric	Product	Limit
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 X670-G2, ExtremeSwitching X690, X870, X590, X465, X695, 5320, 5420, 5520	16*
	ExtremeSwitching 5320, 5420, 5520	4*
BGP auto-peering maximum IPv4 prefixes with ECMP—Maximum number of IPv4 Network prefixes with ECMP.	ExtremeSwitching X670-G2, ExtremeSwitching X690, X870, X590, X465, X695	64,000
	ExtremeSwitching 5320, 5420, 5520	16,000
BGP auto-peering maximum IPv6 prefixes with ECMP—Maximum number of IPv6 Network prefixes with ECMP.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	8,000
	ExtremeSwitching 5320, 5420, 5520	254
BGP auto-peering MLAG peers—maximum MLAG peers per AutoBGP node.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5320, 5420, 5520	1
BGP auto-peering VRFs—maximum number of VRFs.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5320, 5420, 5520	64
BGP auto-peering EVPN instances—maximum EVPN instances.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5320, 5420, 5520	1,024
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 X870, X690, X590, X465, X695	128
	ExtremeSwitching X670-G2, X450-G2, X460-G2, 5320-48T/P, 5420, 5520	64
	ExtremeSwitching X440-G2, X620, 5320-24T/P, 5320-16P	32
EAPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X440-G2, X620, 5320, 5420, 5520	500
	ExtremeSwitching X870, X690, X590, X465, X695	2,000
ERPS domains—maximum number of ERPS domains without CFM configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	32
ERPS domains—maximum number of ERPS domains with CFM configured.	ExtremeSwitching X450-G2, X670-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	16
	ExtremeSwitching X460-G2	32
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	2,000
	ExtremeSwitching X620, X440-G2, 5320-24T/P, 5320-16P	1,000

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

Metric	Product	Limit
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	2,000
	ExtremeSwitching X620, X440-G2, 5320-24T/P, 5320-16P	500
ESRP groups—maximum number of ESRP groups	ExtremeSwitching X450-G2, X460-G2, X670-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	32
ESRP domains—maximum number of ESRP domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320-48T/P, 5420, 5520	511
	ExtremeSwitching 5320-24T/P, 5320-16P	509
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695	64
	ExtremeSwitching 5320, 5420, 5520	8
	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X670-G2, X460-G2, 5520	5,000
	ExtremeSwitching 5320, 5420	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	2,400

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

Metric	Product	Limit
OSPFv2 inter- or intra-area routes —recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590, X465, X695	4,000
	ExtremeSwitching X670-G2, X460-G2, 5520	2,000
	ExtremeSwitching 5320, 5420	1,600
	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	4
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching 5320, 5420	320
	ExtremeSwitching X450-G2, X620, X440-G2	4
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520	4
OSPFv2 routers in a single area— recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X670-G2, X460-G2, 5520	50
	ExtremeSwitching 5320, 5420	40
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	32
	ExtremeSwitching 5320, 5420	25
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X460-G2, X670-G2, 5520	16
	ExtremeSwitching 5320, 5420	12
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 external routes— recommended maximum number of external routes.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching 5320, 5420	7,500
	ExtremeSwitching X450-G2, X440-G2, X620	1,200

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

Metric	Product	Limit
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590, X465, X695	4.000
	ExtremeSwitching X670-G2, X460-G2, 5520	3,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5320, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X440-G2, X620, X590, X465, X695, 5320, 5420, 5520	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X440-G2, X620, X590, X465, X695, 5320, 5420, 5520	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
	ExtremeSwitching 5320, 5420	12
	ExtremeSwitching X450-G2, X440-G2, X620	4
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X440-G2, X620, X690, X590, X465, X695	4
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X440-G2, X620, X690, X590 , X465, X695	4
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	1,750
	ExtremeSwitching X450-G2	1,500
	ExtremeSwitching X440-G2, X620	550

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

Metric	Product	Limit
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5320, 5420, 5520	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5320, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5320, 5420, 5520	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5320, 5420, 5520	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5320, 5420, 5520	32
Port-specific VLAN tags— maximum number of port-specific VLAN tags.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590 , X465	1,023
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520, X695	N/A
Port-specific VLAN tags— maximum number of port-specific VLAN tag ports.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520, X695	N/A
VLAN Port Interfaces (VPIF)— maximum number of VLAN port interfaces.	ExtremeSwitching X460-G2	65,536
	ExtremeSwitching 5320, 5420	60,000
	ExtremeSwitching X465, X590, X670-G2, X690, X870, X695, 5520	131,585
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 X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048
	ExtremeSwitching X440-G2, X620	128
	Sliced Mode:	
	ExtremeSwitching 5320, 5420, 5520	511

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

Metric	Product	Limit
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 X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2,048
	ExtremeSwitching X440-G2, X620	128
VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch.	ExtremeSwitching X670-G2, X460-G2, X450-G2 X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520 **Note:** With Advanced Edge license or higher.	255
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN.	ExtremeSwitching X670-G2, X460-G2, X450-G2 X440-G2, X620, X870, X690, X590, X465, X695, 5320, 5420, 5520 **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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520 **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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8 (20 centisecond or 1 second hello interval)
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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8

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

Metric	Product	Limit
VRRP (v2/v3-IPv4/IPv6)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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 X670-G2, X870, X690, X590, X465, X695, 5520	2,048–4,000
	ExtremeSwitching 5320, 5420	200-375
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—maximum tenant VLANs plus port combinations **Note:** Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching 5320, 5420	200-375
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—maximum static MAC to IP bindings. **Note:** Every FDB entry configured reduces this limit by 1.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	64,000
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—maximum RTEP IP addresses	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	512
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5520	4,000
	ExtremeSwitching 5320, 5420	375
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—or replicator role, maximum number of attached leafs per switch.	ExtremeSwitching X465, X590, X670-G2, X690, X695, X870, 5320, 5420, 5520	256

Core and Premier License Limits

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

Table 12: Supported Limits for Core and Premier License

Metric	Product	Limit
Anycast RP Using PIM—maximum number of IPv4 Anycast RP set per VR.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X620, X690, X870, X590, X465, X695, 5320, 5420, 5520	32
Anycast RP Using PIM—maximum number of IPv6 Anycast RP set per VR.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X620, X690, X870, X590, X465, X695, 5320, 5420, 5520	32
Anycast RP Using PIM—RP peers per Anycast RP set.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X620, X690, X870, X590, X465, X695, 5320, 5420, 5520	10
BGP (aggregates)—maximum number of BGP aggregates.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2, 5320, 5420	204
BGP (networks)—maximum number of BGP networks.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X450-G2, 5320, 5420	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, X670-G2, X870, 5520	128
	ExtremeSwitching , X590, X465, X695	300
	ExtremeSwitching X450-G2, 5320, 5420	100
	ExtremeSwitching X690	500
BGP (peer groups)—maximum number of BGP peer groups.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching X450-G2, 5320, 5420	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2, 5320, 5420	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X450-G2, 5320, 5420	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2, 5320, 5420	20,000

Table 12: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465 , X695, 5520 (at default)	25,000
	ExtremeSwitching X870, X690, X590 , X465 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2	20,000
	ExtremeSwitching 5320, 5420	20,000
	ExtremeSwitching 5520 (with ALPM enabled)	80,000
BGP (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2, 5320, 5420	20,000
BGP ECMP—maximum number of equal cost paths per multipath for BGP and BGPv6.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X450-G2	64
	ExtremeSwitching 5320, 5420, 5520	8
BGPv6 (unicast address-family routes)—maximum number of unicast address family routes.	ExtremeSwitching X460-G2, 5320, 5420, 5520	6,000
	ExtremeSwitching X670-G2	8,000
	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2, 5320, 5420	4,800
	ExtremeSwitching 5520 (with ALPM enabled)	40,000
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, 5520	18,000
	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695	24,000
	ExtremeSwitching X450-G2, 5320, 5420	14,000
EVPN EVI instances—maximum number of EVI instances.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	1,024
EVPN LAGs—maximum number of LAGs.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695	128
GRE Tunnels—maximum number of GRE tunnels.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465 , X695, 5320, 5420, 5520	255
	ExtremeSwitching X620, X440G2	N/A
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	128
	ExtremeSwitching X450-G2	N/A

Table 12: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
IS-IS ECMP—maximum number of equal cost paths per multipath for IS-IS.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	2, 4, or 8
	ExtremeSwitching X450-G2	N/A
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	25,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	25,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A

Table 12: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	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, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A
MPLS RSVP-TE interfaces—maximum number of interfaces.	ExtremeSwitching 5520	32
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	ExtremeSwitching 5520	2000
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	ExtremeSwitching 5520	2000
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	ExtremeSwitching 5520	4000
MPLS RSVP-TE paths—maximum number of paths.	ExtremeSwitching 5520	1000
MPLS RSVP-TE profiles—maximum number of profiles.	ExtremeSwitching 5520	1000
MPLS RSVP-TE EROs—maximum number of EROs per path.	ExtremeSwitching 5520	64
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	ExtremeSwitching 5520	128
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	ExtremeSwitching 5520	64
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	ExtremeSwitching 5520	2048
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	ExtremeSwitching 5520	128
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	ExtremeSwitching 5520	4000
MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch.	ExtremeSwitching 5520	4000

Table 12: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
MPLS static egress LSPs—maximum number of static egress LSPs.	ExtremeSwitching 5520	4000
MPLS static ingress LSPs—maximum number of static ingress LSPs.	ExtremeSwitching 5520	4000
MPLS static transit LSPs—maximum number of static transit LSPs	ExtremeSwitching 5520	4000
MSDP active peers—maximum number of active MSDP peers.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	64
MSDP SA cache entries—maximum number of entries in SA cache.	ExtremeSwitching X670-G2, X690, X590, X465, X695, 5520	14,000
	ExtremeSwitching X450-G2, 5420M	8,000
	ExtremeSwitching 5320, 5420F	6,000
	ExtremeSwitching X460-G2	10,000
	ExtremeSwitching X870	11,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695	64
	ExtremeSwitching 5320, 5420, 5520	8
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X670-G2, X460-G2, 5520	5,000
	ExtremeSwitching X450-G2, 5320, 5420	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 X870, X690, X590, X465, X695	4,000
	ExtremeSwitching X670-G2, X460-G2, 5520	2,000
	ExtremeSwitching X450-G2, 5320, 5420	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching X450-G2, , 5320, 5420	320

Table 12: Supported Limits for Core and Premier License (continued)

| Metric	Product	Limit
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching X450-G2, 5320, 5420	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	128
	ExtremeSwitching X450-G2, 5320, 5420	96
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X670-G2, X460-G2 , 5520	50
	ExtremeSwitching X450-G2, 5320, 5420	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	32
	ExtremeSwitching X450-G2, 5320, 5420	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X460-G2, X670-G2, 5520	16
	ExtremeSwitching X450-G2, 5320, 5420	12
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching X450-G2, 5320, 5420	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590, X465, X695	4.000
	ExtremeSwitching X670-G2, X460-G2, 5520	3,000
	ExtremeSwitching X450-G2, 5320, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2, 5320, 5420	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching X450-G2, 5320, 5420	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
	ExtremeSwitching X450-G2, 5320, 5420	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	255

Table 12: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	255
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	1,750
	ExtremeSwitching X450-G2,	1,500
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5320, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5320, 5420, 5520	32

Notes for Limits Tables

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[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.

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[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`.
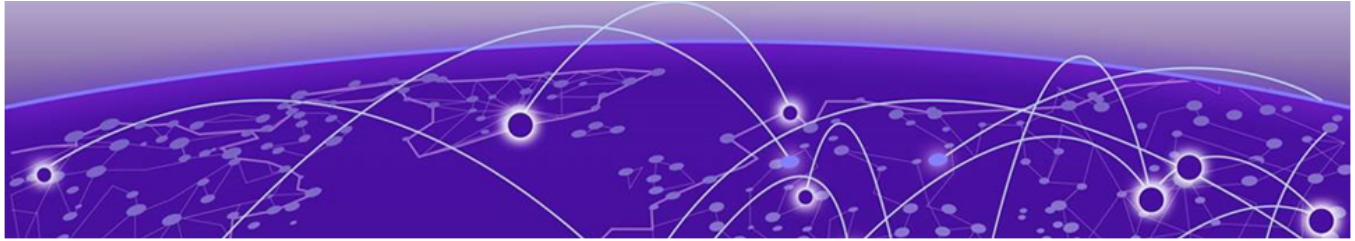
Open Issues, Known Behaviors, and Resolved Issues

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

Open Issues

The following open issue for supported features is found in ExtremeXOS and Switch Engine 31.6.

Defect Number	Description
ExtremeSwitching 5320 Series Switches	
EXOS-30165	When WRED drop profiles are configured and TCP/Non-TCP traffic is sent, a few packet drops may be observed in the corresponding TCP/Non-TCP green traffic. Workaround: TCP and Non-TCP green traffic drop can be avoided or mitigated by configuring the reserved packet buffer of WRED-enabled queue to the maximum value by running the **`configure qosprofile <queue-profile> maxbuffer 10000 ports <port-no>`** command.

Known Behaviors

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

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

Defect Number	Description
General	
EXOS-27575	When encapsulating a packet to be forwarded to a GRE tunnel, the TTL (time to live) field in the delivery IP header is different depending on whether the encapsulated packet requires slow or fastpath processing. When it's slowpath processed (when an IP option is detected on the packet, for example), the TTL is 63. When it's fastpath processed, the TTL is 255.

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

Defect Number	Description
EXOS-30440	ExtremeSwitching X590, X690, X695, and X870 series switches have observed performance degradation for IPv4 slow path forwarding.
EXOS-30582	ECMP is not supported when any one of the next hop of a route is via tunnel.
ExtremeSwitching X465 Series Switches	
EXOS-31156	A crash occurs when a Bluetooth dongle (with paired devices connected via Chalet) is removed. Workaround: Remove the Bluetooth dongle only when there are no paired devices.
ExtremeSwitching 5320 Series Switches	
EXOS-29421	For ExtremeSwitching 5320 16 and 24-port models, a warning message of "Hardware Table not available for IPv6 routes with Long Masks" occurs when a port is added to an IPv6 VLAN. IPv6 unicast traffic intended for a subnet route with a mask length greater than 64 bits can be forwarded to a less-specific route. This issue is not seen if all IPv6 subnet routes have a mask length less than or equal to 64 bits.
EXOS-30092	On the ExtremeSwitching 5320 series switch, cloning via the Network option is not supported in user VRs because the switch does not have a management port. Workaround: Try networking cloning with network reachability over VR-default and VR-Management.

EXOS-31080	ExtremeSwitching 5320 16 and 24-port models have limited ingress ACL "slice" resources and can experience a resource depleted condition when stacking, MLAG, and IPv6 are configured. The following error message may be seen:
	`01/03/2022 10:09:39.14 <Erro:HAL.VLAN.Error>`
	`Slot-1: Filter table Full: Failed to install`
	`IPV6 MC Solicit Filter for the port 1:1`

EXOS-31151	When connected using Chalet to an ExtremeSwitching 5320 (all models) or an 8-port X435 (X435-8T and X435-8P), selecting the **VLAN** tab causes Chalet to remain in the loading state. Workaround: Create a VLAN before selecting the **VLAN** tab.
ACL	
EXOS-30747	Error logs related to ACL may occur when upgrading to software version 31.6. Workaround: Use the shared ACL precedence mode by entering the **`configure access-list vlan-acl-precedence shared`** command.
VXLAN	
EXOS-31220	RIOT traffic is slow path forwarded when DHCP is enabled on the default VLAN.

Resolved Issues in ExtremeXOS 31.6

The following issues were resolved in ExtremeXOS 31.6. Release 31.6 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, and 31.5. 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 31.6

Defect Number	Description
General	
EXOS-29654	DHCP Offer and Acknowledgement packets are broadcasted on all sub-VLANs when the switch acts as a relay agent.
EXOS-30037	The **show ipconfig** command output breaks when CLI mode is configured as "non-persistent."
EXOS-30074	In a SummitStack with a mirror and the source port in non-master node, a loop occurs on the loopback port when running ELRP on the mirror source port.
EXOS-30320	The **debug hal show congestion** command throws an error message when executed in show tech-support.
EXOS-30443	An SSH key is not stored in EEPROM on a newly added slot and gets lost on switch reboot.
EXOS-30781	The following error is seen when attempting to download an image when the switch real time clock has a time set that is older than the image being installed: `Error: Failed to download image - Certificates verification failed; Image signature validation will be bypassed.`
BGP	
EXOS-30280	BGP is not established in user VR if another BGP instance is running on a VRF-type VR.
ExtremeSwitching X695 Series Switches	
EXOS-29899	The **show configuration** command does not display the speed setting of 100G-capable ports.
ExtremeSwitching 5520 Series Switches	
EXOS-30085	Packet buffering performance on 5520 is not proper.
EXOS-30243	ExtremeXOS shows an incorrect FEC clause on 5520-VIM-4YE.
Extended Edge Switching	
EXOS-30042	Unable to retrieve the slot description via SNMP.
OSPFv2	
EXOS-30103	Route tag is not advertised in OSPF redistribution after running the `restart ports` **all** command.
SummitStack	

Table 14: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.6 (continued)

Defect Number	Description
EXOS-29778	The CLI session in SummitStack is locked while saving the configuration if the `save configuration as-script` *script-name* command was executed previously in the same stack prior to turning on the backup/standby nodes.
EXOS-29835	At random times, the port partition-template configuration is lost after several failovers.
EXOS-29876	With certain triggers occur for a slot that is configured but not operational (for example, executing the `show access-list usage acl-slice port` *port* command), the following error message is logged: `Invalid inputs(slot:2, unit:0) to extr_soc_is_xgs3_switch`
VLAN	
EXOS-24651	An SNMP set on ifAlias OID changes both the display-string and description-string.
EXOS-30109	VLANs with IPv6 addresses are missing the **vlan** keyword in the **show configuration** output.
EXOS-30283	DHCP is not enabled on dynamically-created VLANs by ZTP+.
EXOS-30433	IGMP packets are not forwarded when received over network VLAN ports in VXLAN.