Switch Engine Release Notes

Software Version 32.5

9037879-00 Rev AB
August 2023

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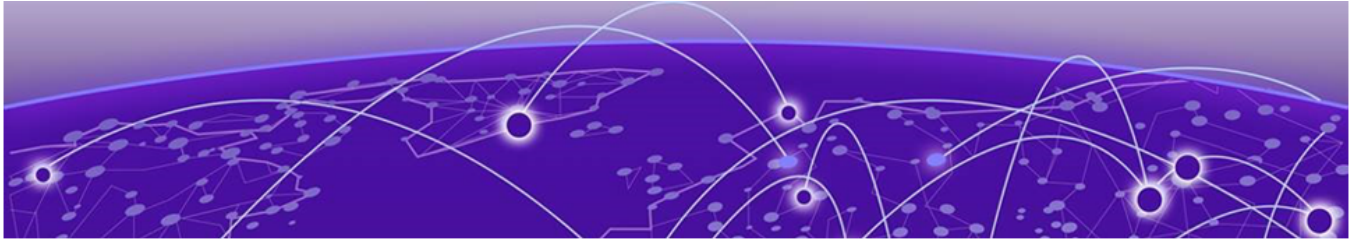

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Preface

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

Table 1: Notes and warnings (continued)

Icon	Notice type	Alerts you to...
	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.

Table 3: Command syntax (continued)

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

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

To send feedback, email us at documentation@extremenetworks.com.

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

Help and Support

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

Extreme Portal

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

The Hub

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

Call GTAC

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

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

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

Subscribe to Product Announcements

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

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

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

Related Publications

Switch Engine Publications

- *Switch Engine 32.5 Command Reference Guide*
- *Switch Engine 32.5 Feature License Requirements*
- *Switch Engine 32.5 User Guide*
- *Switch Engine 32.5 Release Notes*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*
- *Extreme Optics Compatibility*
- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*

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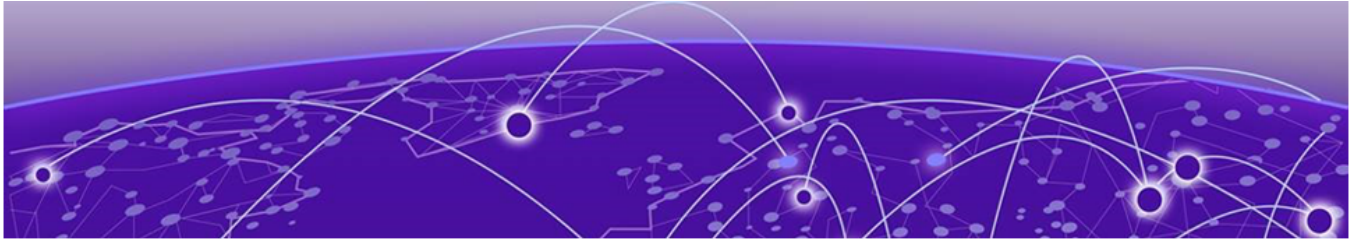
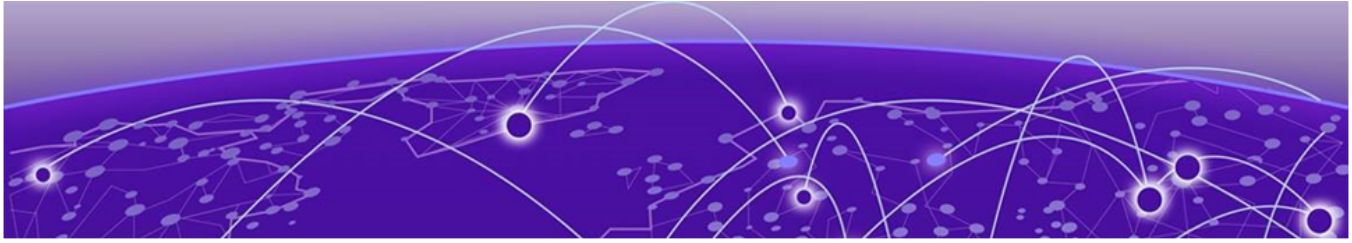


Overview

These release notes document Switch Engine 32.5, which adds features and resolves software deficiencies.



Security Information

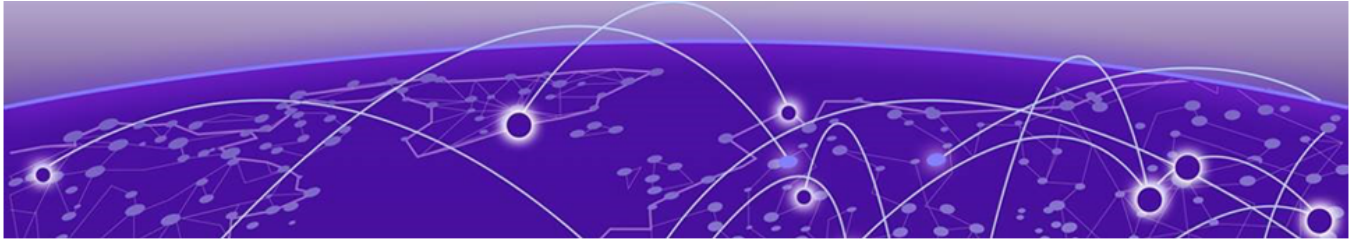
The following section covers important security information for Switch Engine 32.5.

Linux Kernel

Switch Engine 32.5 uses Linux Kernel 5.4.

OpenSSL Version

Switch Engine 32.5 uses FIPS openssl-fips-2.0.16.



Upgrading Switch Engine

For instructions about upgrading Switch Engine software, see *Software Upgrade and Boot Options* in *Switch Engine 32.5 User Guide*.

A 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 system displays the following error message: `Error: Image can only be installed to the non-active partition.`. A Switch Engine modular software package (.xmod file) can still be downloaded and installed on either the active or alternate partition.

Note

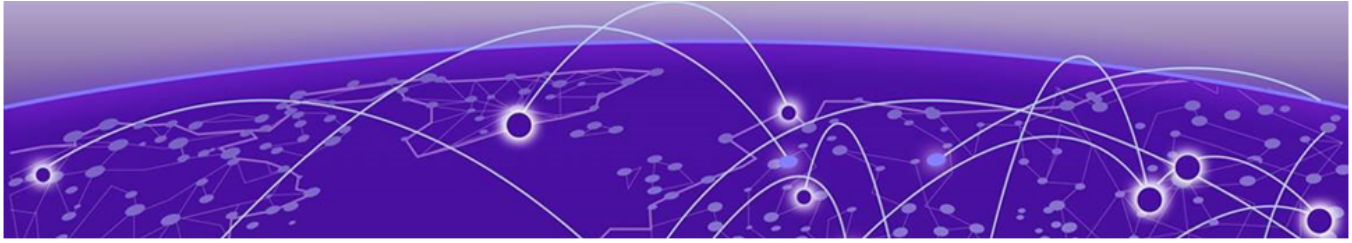
New ExtremeSwitching 5420 and 5520 PoE switches with a Giga device MCU part (switch default ships with supported Switch Engine versions from the factory) will prevent the switch downgrade to older EXOS versions and prevent operating system switchover to unsupported VOSS versions.

The following error message is displayed during the downgrades to older versions:

```
Error: Failed to download image - summit_arm-31.6.1.3.xos does not
include compatible PoE microcontroller support. See the User Guide for
information on installing a newer software release. See the
Hardware/Software Compatibility and Recommendation Matrices to verify the
supported releases.
```

The switch can be identified for the inclusion of the Giga device MCU by checking the PoE firmware revision (5.0 or later) by entering the `show inline-power stats` command (line four):

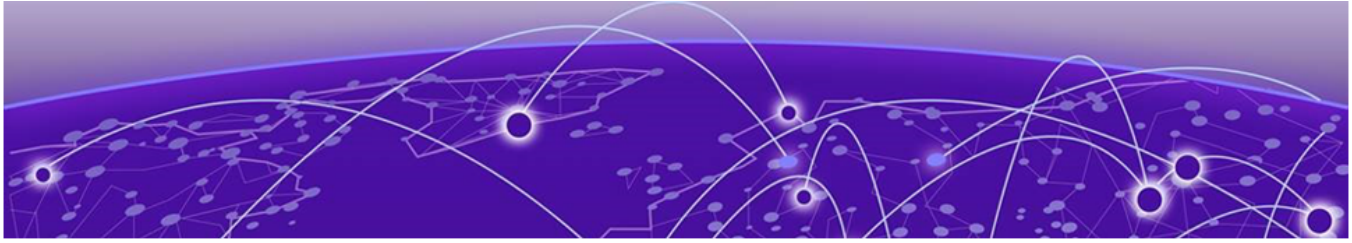
```
# show inline-power stats
Inline-Power Slot Statistics
Firmware status               : Operational
Firmware revision             : 5.0.0b4
Total ports powered           : 3
Total ports awaiting power    : 20
Total ports faulted           : 0
Total ports disabled          : 1
```



Newly Purchased Switches Require Software Upgrade

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

For information about upgrading the Switch Engine software, see the *Switch Engine Upgrade Process* topic in the *Software Upgrade and Boot Options* chapter of the *Switch Engine 32.5 User Guide*.



Default Switch Engine Settings

The following table shows the default settings for Switch Engine starting with version 31.6, and shows any changes that have been made to these settings and in what version these changes were made.

Table 4: Default Switch Engine Settings

Feature	31.6 and later	32.4 and later
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. [a]	
Auto-Discovery for Universal Hardware	Enabled.	
AVB	Disabled.	
BFD Strict Session Protection	Disabled.	
BGP	Disabled.	
Bluetooth	Enabled.	
BOOTP Relay	Disabled.	
CDP	Enabled.	
Configuration auto save	Disabled.	
Clear-flow	Disabled.	
Diagnostics	Admin level privileges required to show diagnostics. [a]	
DHCP	Disabled.	
DNS Cache Resolver and Analytics	Disabled.	
IPFIX	Disabled.	
IP NAT	Disabled.	
EAPS	Disabled.	
EDP	Enabled on management port.	
ELRP	Disabled.	

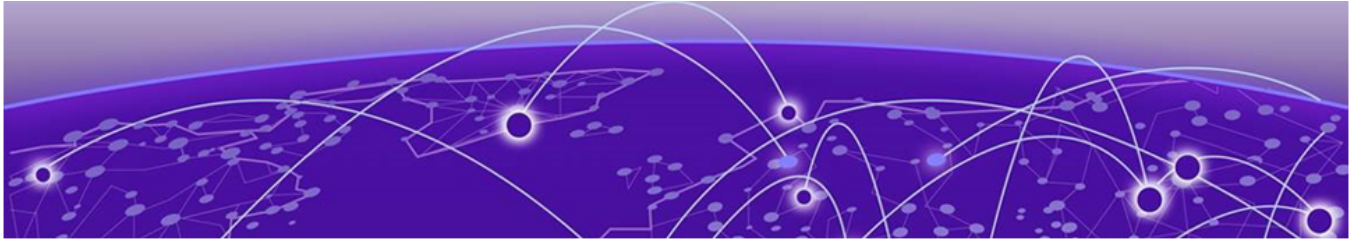
[a] If you choose enhanced security mode when initially setting up the switch or after running `unconfigure switch all`.

Table 4: Default Switch Engine Settings (continued)

Feature	31.6 and later	32.4 and later
ESRP	Disabled.	
Extended Edge Switching (VPEX)	Disabled.	
ExtremeCloud IQ	Enabled	
FEC	Enabled on Native 25Gb ports.	
Identity Management	Disabled.	
IGMP	Enabled, set to IGMPv2 compatibility mode.	
IGMP Snooping	Enabled.	
Image Integrity Check	Disabled.	
IP Route Compression	Enabled.	
ISIS	Disabled.	
LLDP	Enabled.	
Log	Admin level privileges required to show log. [a]	
Logging memory buffer	Generate an event when the logging memory buffer exceeds 90% of capacity. [a]	
MAC Security	Disabled.	
MLD	Disabled.	
MLD Snooping	Disabled.	
MPLS	Disabled.	
MSRP	Disabled.	
MSTP	Enabled.	
NetLogin	All types of authentication are disabled.	
NTP	Disabled.	
ONEPolicy	Disabled.	
Policy rule model	Hierarchical (Unless upgrading from 30.5 with a saved configuration set to access list.)	
OpenFlow	Disabled.	
OSPF	Disabled.	
OVSDB	Disabled.	
Passwords	Plain text password entry not allowed. [a]	
PIM	Disabled.	

Table 4: Default Switch Engine Settings (continued)

Feature	31.6 and later	32.4 and later
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. [a]	
SSH	Disabled.	
Stacking-support	Enabled.	Disabled for Extreme 7520 and 7720 only.
Stacking auto-discovery	Enabled.	
STP	Enabled.	
Syslog	Disabled.	
TACACS	Disabled.	
Telnet	Enabled. [a]	
VPEX IP Multicast Replication	BPE	
VPLS	All newly created VPLS instances are enabled.	
Watchdog	Enabled.	
Web HTTP server	Enabled. [a]	
Web HTTPS server	Disabled. [a]	

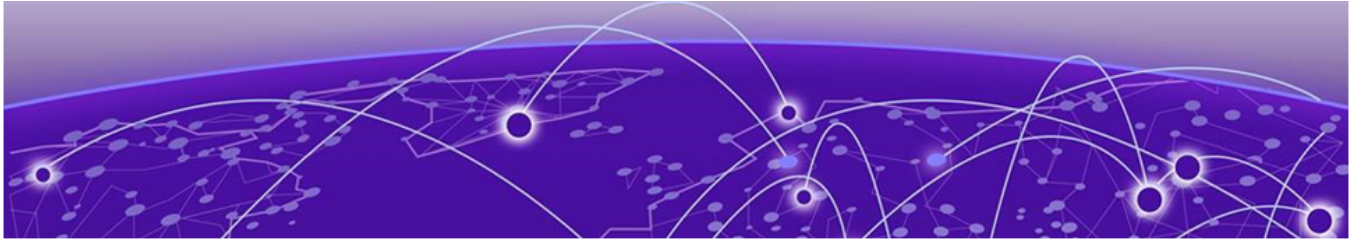


Switch Engine Image File Names

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

Table 5: Switch Engine Image Types (Prefixes)

Switches	Image File Type (Prefix)
ExtremeSwitching 5320, 5420, 5520	`summit_arm` Example: `summit_arm-31.1.0.3.xos`
ExtremeSwitching 5720, 7520, 7720	`onie` Example: `onie-32.1.1.6.x86_64.xos`



New and Corrected Features in Switch Engine 32.5

This section lists the new and corrected features supported in the 32.5 software:

Auto-bind on Spanning Tree Protocol Domain for Auto-provisioned VLANs

Version 32.5 modifies a Zero Touch Provisioning – Dynamic Host Configuration Protocol (ZTPDHCP) script to enable auto-bind on Spanning Tree Protocol Domain (STPD) "s0" for auto-provisioned Virtual Local Area Networks (VLAN). This allows the newly created VLAN(s) to participate in “s0” along with the default VLAN.

The ZTPDHCP script enables auto-bind by calling the following CLI command for every VLAN it creates:

```
enable stpd s0 auto-bind [ {vlan} vid
```

If during ZTP the path to a DHCP server uses a tagged port, then the ZTPDHCP script auto-provisions a corresponding VLAN and adds the tagged port. This removes the port from STP Domain "s0", which may result in a network loop. Enabling auto-bind for the auto-provisioned VLAN on STPD "s0" provides loop protection.

The log file generated by the ZTPDHCP script logs the event whenever auto-bind is enabled on STPD “s0” for a newly created VLAN.

Supported Platforms

All platforms.

Audio Video Bridging Support on ExtremeSwitching 5720 VIM Ports

Version 32.5 adds Audio Video Bridging (AVB) support on ExtremeSwitching 5720 VIM-2CE and VIM-6YE ports. Including these ports, AVB is supported on 5720 front panel ports by default, and also Universal Ethernet ports “U1” and “U2” when using the **`disable stacking-support`** command.

Integrated Application Hosting Support for Extreme 7720

Version 32.5 adds Integrated Application Hosting (IAH) support for the Extreme 7720-32C switch, ports 33 and 34. IAH is now supported on all 7520 and 7720 series switches.

Multiprotocol Label Switching Support on Extreme 7520 and 7720

Version 32.5 adds Multiprotocol Label Switching (MPLS) support on Extreme 7520 and 7720 series switches. MPLS speeds up network traffic. When forwarding packets, the Layer 2 (Switching) label is used to avoid complex destination lookups in the routing table. MPLS uses Label Switched Paths (LSPs) to establish the network path. The packet will be labeled so that service providers can decide the best way to keep traffic flowing.

Port Bounce Attribute Support

Version 32.5 introduces port bounce attribute support. Port bouncing is the process of temporarily disabling and re-enabling a network port, which enables the clients connected to an authenticator to reinitiate a DHCP request. RADIUS port bounce occurs only when there is a change in the authenticator VLAN and when a CoA request is received from a RADIUS server with VSA port bounce. You can enable or disable port bounce using the command line interface, but first you must do the following:

- Start an active Netlogin session on an authenticator port.
- Create a policy.
- Enable Dynamic Authentication.

Supported Platforms

All platforms.

New CLI Command

The following new command configures the port bounce feature:

```
configure radius port bounce [ on | off]
```

Support for Partition Change with an Existing Link Aggregation Group

Version 32.5 adds support for ports with different max speed capabilities to be part of the same Link Aggregation Group (LAG). This lets you change speed and the auto-negotiation configuration of a port that is part of a LAG without unconfiguring and

reconfiguring the LAG. This feature also supports dynamic repartitioning of the LAG ports without deleting and then recreating the LAG.

Supported Platforms

All platforms that support LAG and port partitioning.

Support for RSA/SHA256 for Host Key Algorithm

Version 32.5 adds support for two new host key algorithms: rsa-sha2-256 and rsa-sha2-512. While the default algorithm remains ssh-rsa, this SHA-1 algorithm is weak and not recommended. In version 32.5, you can use the CLI to select the host key algorithm from the list of three options.

During an upgrade to version 32.5, the ssh-rsa type host key present in the switch is used, but the following EMS log will be generated when the switch starts:

```
04/25/2023 08:19:25.67 <Noti:exsshd.CfgHostKeyAlgWeak> The configured host key
algorithm(s),
        ssh-rsa, is/are weaker than what is recommended.
```

The switch will continue to generate an ssh-rsa type key until you use the **configure ssh2 key algorithm** command. Once you use the command to make a selection, the new algorithm chosen will take effect when you run **disable/enable ssh2** or **sshd restart**, as displayed in the following example output:

```
# configure ssh2 key algorithm rsa-sha2-256
New key algorithm will be usable after disable and enable SSH or 'restart process exsshd'.

Warning: Legacy clients that do not support this algorithm will not connect with the
        switch's SSH server.
```

Use the **show ssh2** command to display current and configured algorithms.

Supported Platforms

All platforms.

New CLI Command

The following command configures the host key algorithm:

```
configure ssh2 key algorithm [ ssh-rsa | rsa-sha2-256 | rsa-sha2-512]
```

Changing the Network Operating System

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

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 23)—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 you see the message `Starting Default Bootloader ...Press and hold the <spacebar> to enter the bootrom`, press and hold the **space bar** until the boot menu is displayed (you have 30 seconds):

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

     EXOS: Default
     EXOS: Primary 32.1.1.6
     EXOS: Secondary 32.1.1.6
     EXOS: Primary 32.1.1.6 with default configuration
     EXOS: Secondary 32.1.1.6 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**.

Note
The 5720 Series uses the **GRUB** menu. There is no need to press and hold the **space bar**. Use the **up** and **down** arrow keys to navigate the menu.

- **Safe defaults mode start-up menu**—When the question `Would you like to change the switch OS to VOSS? [y/N/q]` is displayed:
  - 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 *Switch Engine 32.5 User Guide*.

Changing Your Network Operating System

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

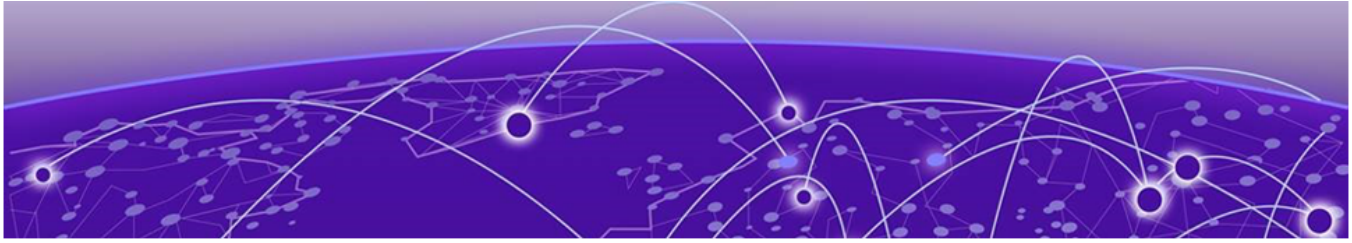
Caution
Changing your network operating systems deletes all configuration files, debug information, logs, events, and statistics information of the previous network operating system.

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 *Switch Engine 32.5 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

Switch Engine supports ExtremeCloud IQ. For network administrators looking for unified management of access points, switches, & 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, OS choice
- offers unlimited data duration for more informed networking decisions

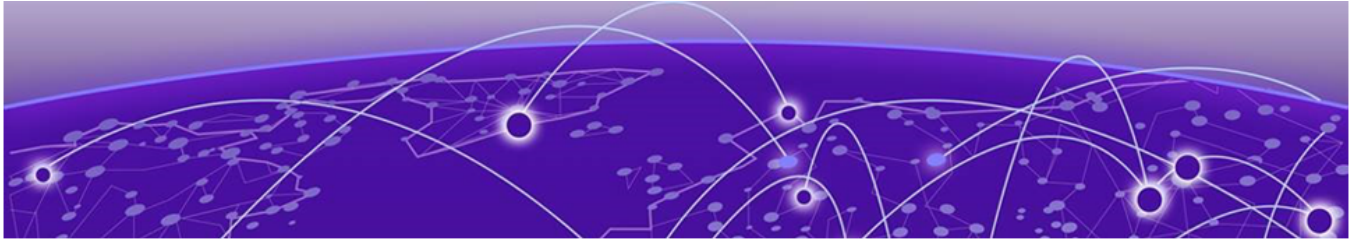
Important
Check the ExtremeCloud IQ release notes to ensure support for your version has been added before upgrading.

This release supports device discovery, basic monitoring, visibility into homogenous stacking, and the ability to configure an optional user-defined virtual router (VR) and address of the server 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 6: Supported Platforms

Switch Series	Switch Models
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
ExtremeSwitching 5720	5720-24MW 5720-24MXW 5720-48MW 5720-48MXW
Extreme 7520	7520-48Y-8C 7520-48XT-6C
Extreme 7720	7720-32C



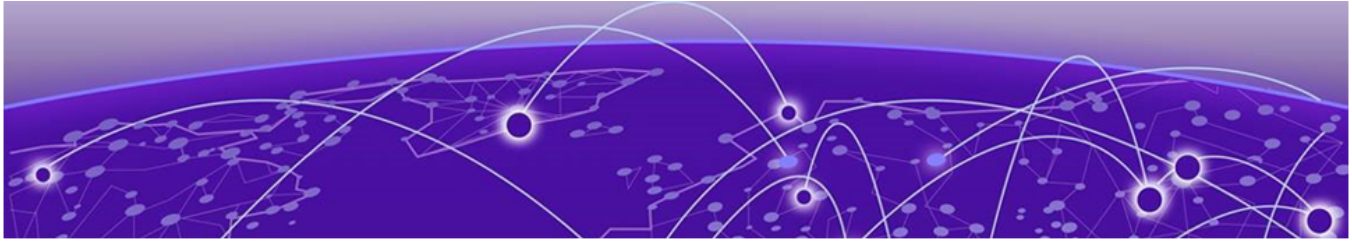
Extreme Hardware/Software Compatibility and Recommendation Matrices

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

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

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

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

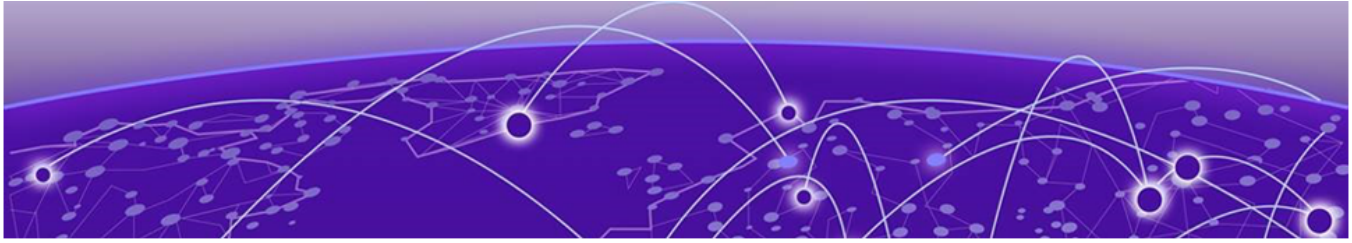


Compatibility with ExtremeCloud IQ - Site Engine

Switch Engine 32.5 is compatible with the version of ExtremeCloud IQ - Site Engine as shown in this table: http://emc.extremenetworks.com/content/common/releasenotes/extended_firmware_support.htm

Switch Engine 32.5 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.

The ExtremeCloud IQ – Site Engine version 22.6 and Switch Engine version 32.1 can be used to onboard and manage the 5720 product line in non-production (demo/lab only) environments. For deployment in the production environment, an upgrade is required to both the Switch Engine firmware and the ExtremeCloud IQ – Site Engine version.

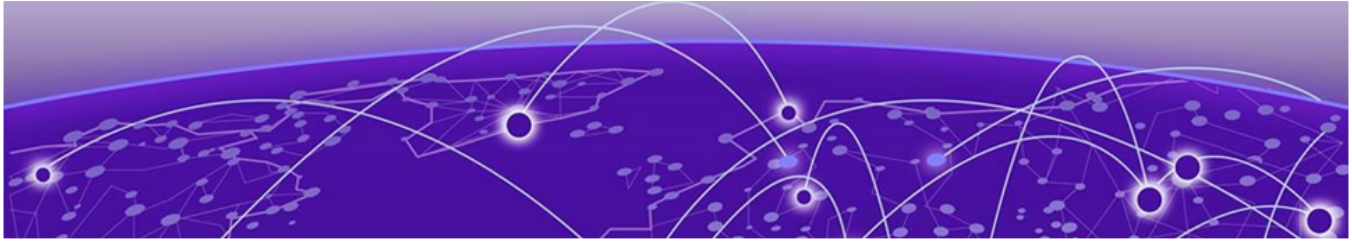


Supported MIBs

The Extreme Networks management information bases (MIBs) are located on the Extreme Portal in the Downloads section. Log in to the Extreme Portal to view and download.

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 *Switch Engine 32.5 User Guide*.



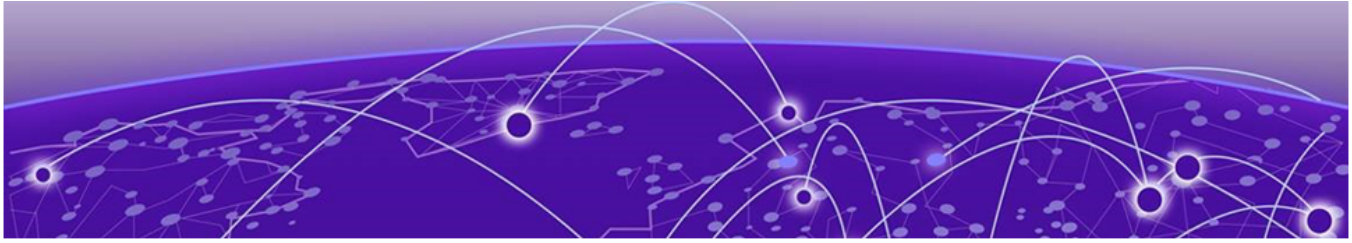
Tested Third-Party Products

The following third-party products have been tested for Switch Engine 32.5.

Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS



Extreme Switch Security Assessment

DoS Attack Assessment

Tools used to assess DoS attack vulnerability:

- Network Mapper (NMAP)

ICMP Attack Assessment

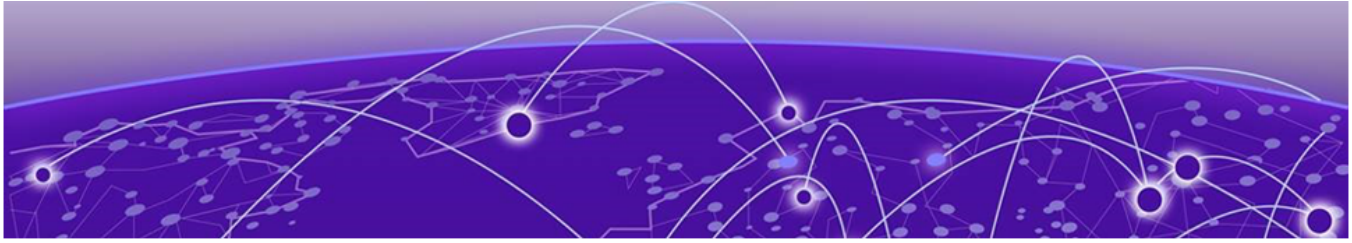
Tools used to assess ICMP attack vulnerability:

- SSPing
- Twinge
- Nuke
- WinFreeze

Port Scan Assessment

Tools used to assess port scan assessment:

- Nessus



Limits

This chapter summarizes the supported limits in Switch Engine 32.5.

Limits Overview

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

- Base License Limits on page 32
- Premier License Limits on page 63

The ExtremeSwitching Universal family of switches includes two license levels: Base and Premier.

The following figure illustrates that each license level builds on the features of the license level below it. For example, the Premier license includes all of the features in the Base license, plus the features in the Premier license level.

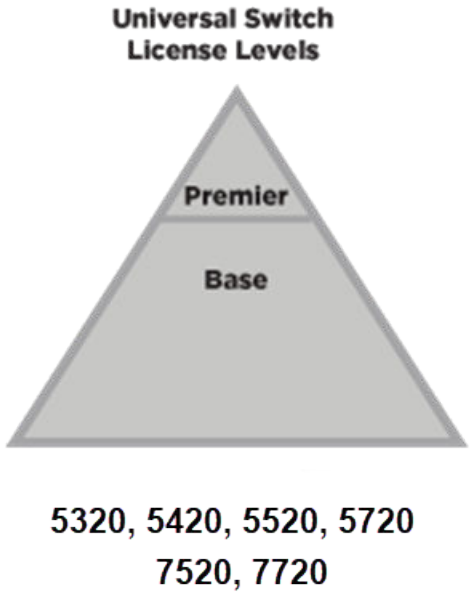


Figure 1: License Levels for Universal Switches

For more information about licenses, see *Switch Engine 32.5 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 Switch Engine books.

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

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

In the Extended Edge Switching architecture, Layer-2, Layer-3, and multicast packet forwarding and filtering operations take place on the controlling bridge. The controlling bridge switch and attached BPEs (V400 Virtual Port Extenders) constitute a single,

extended switch system. Therefore, the Extended Edge Switching system assumes the scale and limits from the specific controlling bridge model in use. For applicable limits, see the following tables for the controlling bridge you are using.

Base License Limits

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

Table 7: Supported Limits for the Base License

Metric	Product	Limit
Access lists (meters)—maximum number of meters.	ExtremeSwitching 5320, 5420	6,144 ingress 512 egress
	Extreme 7520, 7720	6,000 ingress 2,000 egress
	ExtremeSwitching 5520	2,048 ingress 512 egress
	ExtremeSwitching 5720-MW	6,144 ingress 3,072 egress
	ExtremeSwitching 5720-MXW	6,144 ingress 6,144 egress
Access lists (policies)—suggested maximum number of lines in a single policy file.	All platforms	300,000

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Access lists (policies)—maximum number of rules in a single policy file.[a]	ExtremeSwitching 5320-48T/P, Extreme 7520, 7720	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
	ExtremeSwitching 5720-MW	18,432 (80-bit) ingress 8,192 egress
	ExtremeSwitching 5720-MXW	36,864 (80-bit), 18,432 (160-bit) ingress 12,288 egress
Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP).	ExtremeSwitching 5520, 5720	2,048 ingress only
	ExtremeSwitching 5320-48T/P, 5420, Extreme 7520, 7720	1,024 ingress only
	ExtremeSwitching 5320-16P	512 ingress only

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Access lists (slices)—number of ACL slices.	ExtremeSwitching 5720, Extreme 7520, 7720	12 ingress 4 egress
	ExtremeSwitching 5320-48T/P, 5420, 5520	18 ingress 4 egress
	ExtremeSwitching 5320-24T/P, 5320-16P	8 ingress 4 egress
Access lists (slices)—number of ACL slices in first stage (VFP).	All platforms	4 ingress only
ACL Per Port Meters—number of meters supported per port.	All platforms	16
ACL port ranges.	All platforms	32
Meters Packets-Per-Second Capable.	All platforms	N/A
AVB (audio video bridging)—maximum number of active streams.	ExtremeSwitching 5320, 5420	1,024
	ExtremeSwitching 5520, 5720	4,096
BFD sessions (Software Mode)—maximum number of BFD sessions.	All platforms (default timers—1 sec)	512
BGP (peers)—maximum number of BGP peers.	All platforms	2
BGP auto-peering—maximum number of auto-peering nodes and VTEPs.	All platforms	64
BGP auto-peering attached IPv4 hosts— maximum number of attached IPv4 hosts.	All platforms	64,000
BGP auto-peering attached IPv6 hosts— maximum number of attached IPv6 hosts.	All platforms	8,000
BGP auto-peering ECMP—maximum number of equal cost multipath for auto-peering. **Note:** * Subject to the limitation imposed by the number of physical ports on a switch.	ExtremeSwitching 5720, Extreme 7520, 7720	16*
	ExtremeSwitching 5320, 5420, 5520	4*

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
BGP auto-peering maximum IPv4 prefixes with ECMP—Maximum number of IPv4 Network prefixes with ECMP.	ExtremeSwitching 5320, 5420, 5520, 5720 Extreme 7520, 7720	16,000 64,000
BGP auto-peering maximum IPv6 prefixes with ECMP—Maximum number of IPv6 Network prefixes with ECMP.	ExtremeSwitching 5320, 5420, 5520, 5720 Extreme 7520, 7720	254 64,000
BGP auto-peering MLAG peers—maximum MLAG peers per AutoBGP node.	All platforms	1
BGP auto-peering VRFs—maximum number of VRFs.	All platforms	64
BGP auto-peering EVPN instances—maximum EVPN instances.	All platforms	1,024
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	All platforms	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	All platforms	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents	All platforms	4,000
Connectivity fault management (CFM)—maximum number or CFM domains.	All platforms	8
CFM—maximum number of CFM associations.	All platforms	256
CFM—maximum number of CFM up end points.	All platforms	32
CFM—maximum number of CFM down end points.	All platforms	32
CFM—maximum number of CFM remote end points per up/down end point.	All platforms	2,000
CFM—maximum number of dot1ag ports.	All platforms	128
CFM—maximum number of CFM segments.	All platforms	1,000
CFM—maximum number of MIPs.	All platforms	256

Table 7: Supported Limits for the 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 5320, 5420, 5720, Extreme 7520, 7720 ExtremeSwitching 5520	8,192 9,215
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)—maximum number of DCBX application TLVs.	All platforms	8
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	All platforms	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 5320, 5420, 5520, 5720 Extreme 7520, 7720	2,050 2,048
Dynamic ACLs—maximum number of ACLs processed per second. **Note:** Limits are load-dependent.	All platforms 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.	Extreme 7520, 7720 ExtremeSwitching 5720 ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520	4 128 32 64
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	1,000 2,000
EAPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320, 5420, 5520 ExtremeSwitching 5720, Extreme 7520, 7720	500 2,000
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	4,000 5,000

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
ERPS domains—maximum number of ERPS domains with or without CFM configured.	All platforms	32
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320-24T/P, 5320-16P	1,000
	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	2,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320-24T/P, 5320-16P	500
	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	2,000
ESRP groups—maximum number of ESRP groups	All platforms	32
ESRP domains—maximum number of ESRP domains.	All platforms	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	All platforms	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	511
	ExtremeSwitching 5320-24T/P, 5320-16P	509
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	All platforms	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	All platforms	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	All platforms	1
Extended Edge Switching maximum BPEs—maximum number of attached bridge port extenders (BPEs).	ExtremeSwitching 5520	48
	ExtremeSwitching 5420	20
Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs).	ExtremeSwitching 5420, 5520	2 on V400-24 and V300 models 4 on V400-48 models

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Extended Edge Switching maximum tiers—maximum number of cascade levels (tiers) of bridge port extenders (BPEs).	ExtremeSwitching 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 5420, 5520	8
Extended Edge Switching maximum VLANs—maximum number of VLANs - Includes all VLANs	ExtremeSwitching 5520 ExtremeSwitching 5420	4,094 1,024
Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships.	ExtremeSwitching 5520 ExtremeSwitching 5420	12,000 in hash mode (default) 131,000 in port-group mode 8,750 in hash mode (default) 131,617 in port-group mode
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching 5320-48P ExtremeSwitching 5420F-48T ExtremeSwitching 5520-24T ExtremeSwitching 5720-MW ExtremeSwitching 5720-MXW Extreme 7520, 7720	19,142 pps 21,585 pps 18,838 pps 27,000 pps 31,000 pps 34,813 pps
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching 5320 ExtremeSwitching 5420M ExtremeSwitching 5420F ExtremeSwitching 5520 ExtremeSwitching 5720-MW ExtremeSwitching 5720-MXW, Extreme 7520, 7720	32,000 65,536 32,768 [f] 114,688 [f] 163,840 [f] 294,912 [f]

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	ExtremeSwitching 5520, 5720-MW, Extreme 7520, 7720	4,096
	ExtremeSwitching 5420	1,024
	ExtremeSwitching 5320	1,000
	ExtremeSwitching 5720-MXW	16,000
FDB (maximum L2 entries)—maximum number of MAC addresses.	ExtremeSwitching 5320	32,000
	ExtremeSwitching 5420M	65,536
	ExtremeSwitching 5420F	32,768 [g]
	ExtremeSwitching 5520	114,688 [g]
	ExtremeSwitching 5720-MW	163,840 [g]
	ExtremeSwitching 5720-MXW, Extreme 7520, 7720	294,912 [g]
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching 5520, Extreme 7520, 7720	4,096
	ExtremeSwitching 5320, 5420	1,024
	ExtremeSwitching 5720	16,000
Identity management—maximum number of Blacklist entries.	All platforms	512
Identity management—maximum number of Whitelist entries.	All platforms	512
Identity management—maximum number of roles that can be created.	All platforms	64
Identity management—maximum role hierarchy depth allowed.	All platforms	5
Identity management—maximum number of attribute value pairs in a role match criteria.	All platforms	16
Identity management—maximum number of child roles for a role.	All platforms	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	All platforms	8

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Identity management—maximum number of LDAP servers that can be configured.	All platforms	8
Identity management—maximum number of Kerberos servers that can be configured.	All platforms	20
Identity management—maximum database memory size.	All platforms	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.	All platforms	100
Identity management—recommended number of ACL entries per identity. **Note:** Number of ACLs per identity, based on system ACL limitation.	All platforms	20
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	All platforms	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching 5320, 5420, Extreme 7520, 7720 ExtremeSwitching 5720 ExtremeSwitching 5520	1,500 4,000 2,500
IGMPv1/v2 SSM-map entries—maximum number of IGMPv1/v2 SSM mapping entries.	All platforms	500
IGMPv1/v2 SSM-map entries—maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	All platforms	50

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	All platforms	4,000
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520	20,000
	ExtremeSwitching 5720-MW, Extreme 7520, 7720	45,000
	ExtremeSwitching 5720-MXW	54,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	All platforms	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	All platforms	4,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520	20,000
	ExtremeSwitching 5720-MW, Extreme 7520, 7720	45,000
	ExtremeSwitching 5720-MXW	54,000
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 5320, 5520	74,750 [h]
	ExtremeSwitching 5420M models	24,000
	ExtremeSwitching 5420F models	12,000
	ExtremeSwitching 5720-MW	100,000
	Extreme 7520, 7720	184,318 (up to)
	ExtremeSwitching 5720-MXW	221,000
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 5320	12,000
	ExtremeSwitching 5420M models	24,000
	ExtremeSwitching 5420F models	12,000
	ExtremeSwitching 5520	60,000 [h]
	ExtremeSwitching 5720-MW	80,000 [h]
	Extreme 7520, 7720	146,000 [h]
	ExtremeSwitching 5720-MXW	172,000 [h]

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
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 5320	10,000
	ExtremeSwitching 5420M models	21,000
	ExtremeSwitching 5420F models	10,000
	ExtremeSwitching 5520	49,000 [h]
	ExtremeSwitching 5720-MW	70,000 [h]
	Extreme 7520, 7720	125,000 [h]
	ExtremeSwitching 5720-MXW	156,000 [h]
IP flow information export (IPFIX)—number of simultaneous flows.	ExtremeSwitching 5320	N/A
	ExtremeSwitching 5420	4,000 (IPv4 and IPv6 flows)
	ExtremeSwitching 5520	32,000 (IPv4 flows) 18,000 (IPv6 flows)
	ExtremeSwitching 5720	257,000 (IPv4 flows) 112,000 (IPv6 flows)
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 5320	20,000
	ExtremeSwitching 5320-24T/P, 5320-16P	24,000
	ExtremeSwitching 5420M	36,000
	ExtremeSwitching 5420F	24,000 [h]
	ExtremeSwitching 5520	102,000 [h]
	ExtremeSwitching 5720-MW	139,000 [h]
	Extreme 7520, 7720	241,000 (up to) [h]
	ExtremeSwitching 5720-MXW (with ALPM enabled)	245,000 [h]
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	ExtremeSwitching 5520	81,000
	ExtremeSwitching 5320, 5420	25,000
	Extreme 7520, 7720	131,000
	ExtremeSwitching 5720-MW	163,000
	ExtremeSwitching 5720-MXW	288,000
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching 5520	81,000 [q]
	Extreme 7520, 7720	131,000 [q]
	ExtremeSwitching 5720-MW	163,000 [q]
	ExtremeSwitching 5720-MXW	288,000 [q]

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	All platforms	255
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	All platforms	1 (per virtual router)
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	All platforms	255
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	All platforms	2,048
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching 5320	6,000
	ExtremeSwitching 5420M models	12,000
	ExtremeSwitching 5420F models	6,000
	ExtremeSwitching 5520	18,000 [s]
	ExtremeSwitching 5720-MW	24,000 [s]
	Extreme 7520, 7720	57,000 [h]
	ExtremeSwitching 5720-MXW	78,000 [s]
IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	ExtremeSwitching 5520	18,000 [q]
	ExtremeSwitching 5320, 5420	25,000
	Extreme 7520, 7720	65,000 [q]
	ExtremeSwitching 5720-MW	107,000 [q]
	ExtremeSwitching 5720-MXW	213,000 [q]
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching 5520	40,000 [q]
	ExtremeSwitching 5420	6,000
	Extreme 7520, 7720	65,000 [q]
	ExtremeSwitching 5720-MW	107,000 [q]
	ExtremeSwitching 5720-MXW	213,000 [q]
IPv6 routes with a mask greater than 64 bits in hardware—maximum number of such IPv6 LPM routes in hardware.	ExtremeSwitching 5320, 5420	256
	ExtremeSwitching 5520, Extreme 7520, 7720	8,192 [r]
	ExtremeSwitching 5720-MW	16,000 [r]
	ExtremeSwitching 5720-MXW	24,000 [r]
IPv6 route sharing in hardware—route mask lengths for which ECMP is supported in hardware.	ExtremeSwitching 5320, 5420	0–64, >64 single path only
	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	0–128 [r]

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching 5320-48T/P, 5420	1,533
	ExtremeSwitching 5320-24T/P, 5320-16P	509
	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	2,048
IP multicast static routes—maximum number of permanent multicast IP routes.	All platforms	1,024
IP unicast static routes—maximum number of permanent IP unicast routes.	All platforms	1,024
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 5320, 5420, 5520	2, 4, or 8
	ExtremeSwitching 5720, Extreme 7520, 7720	2, 4, 8, 16, 32, or 64

Table 7: Supported Limits for the 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 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 *Switch Engine 32.5 User Guide*.	510 (if maximum gateways is 2) 254 (if maximum gateway 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 *Switch Engine 32.5 User Guide*.	2046 (if maximum gateways is 2) 1022 (if maximum gateway is 4) 510 (if maximum gateways is 8)
	ExtremeSwitching 5720 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	2,046 2,046 2,046 1,022 510 254

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
	about RIOT, see *Switch Engine 32.5 User Guide*.	
	Extreme 7520, 7720 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 *Switch Engine 32.5 User Guide*.	4,094 4,094 2,046 1,022 510 254
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	All platforms	255
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	All platforms	9,216
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 5320 ExtremeSwitching 5420 ExtremeSwitching 5520 ExtremeSwitching 5720-MW Extreme 7520, 7720 ExtremeSwitching 5720-MXW	32,000 64,000 32,768 49,152 73,000 81,920

Table 7: Supported Limits for the 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 5320 ExtremeSwitching 5420M ExtremeSwitching 5420F ExtremeSwitching 5520 ExtremeSwitching 5720-MW Extreme 7520, 7720 ExtremeSwitching 5720-MXW	8,000 12,000 6,000 43,000 61,000 104,000 110,000
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 5320 ExtremeSwitching 5420M ExtremeSwitching 5420F ExtremeSwitching 5520 ExtremeSwitching 5720-MW Extreme 7520, 7720 ExtremeSwitching 5720-MXW	4,000 6,000 3,000 21,500 30,500 52,000 55,000
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.	All platforms	128
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching 5320, 5420 For standalone: ExtremeSwitching 5520, 5720, Extreme 7520, 7720 For stacked: ExtremeSwitching 5520, 5720, Extreme 7520, 7720	8 32 64

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Logged messages—maximum number of messages logged locally on the system.	All platforms	20,000
MAC-based security—maximum number of MAC-based security policies.	All platforms	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	All platforms	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	All platforms	2,048
Maximum mirroring instances.	All platforms	4 total, 2 egress
Mirroring (filters)—maximum number of mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	All platforms	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.	All platforms	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	All platforms	16
MLAG ports—maximum number of MLAG ports allowed. **Note:** The number of MLAG ports that can be configured is limited by the number of physical ports present in the system.	ExtremeSwitching 5320 ExtremeSwitching 5720 ExtremeSwitching 5420, 5520 Extreme 7520, 7720 Stacking **Note:** Maximum user ports	55 63 59 61 1

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
MLAG peers—maximum number of MLAG peers allowed.	All platforms	2
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520 ExtremeSwitching 5720, Extreme 7520, 7720	1,500 1,000 1,500
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	All platforms	4,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520 ExtremeSwitching 5720-MW Extreme 7520, 7720 ExtremeSwitching 5720-MXW	10,000 30,000 45,000 54,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	All platforms	4,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520 ExtremeSwitching 5720-MW Extreme 7520, 7720 ExtremeSwitching 5720-MXW	10,000 30,000 45,000 54,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	All platforms	200
Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries.	All platforms	500
Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries.	All platforms	50
Network Address Translation (NAT) VLANs—maximum number of NAT VLANs.	Extreme 7520, 7720	4

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Network Address Translation (NAT) Sessions—number of NAT sessions supported (non twice-NAT).	Extreme 7520, 7720	1,023
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	All platforms	1,024
Network Login—maximum number of clients being authenticated with policy mode enabled with TCI overwrite enabled.	All platforms	1,024
Network Login—maximum number of dynamic VLANs.	All platforms	1,024
Network Login VLAN VSAs—maximum number of VLANs a client can be authenticated on at any given time.	All platforms	10
Network Service Identifiers (NSI)/VLAN mappings—maximum number of VLANs to NSI mappings.	All platforms	94
Node Alias—maximum number of entries per slot.	All platforms	8,192
ONEPolicy Dynamic ACL Rules—maximum number of Dynamic ACLs supported via RADIUS VSA 232 per user in Access-List mode.	All platforms	64
ONEPolicy Roles/Profiles—maximum number of policy roles/profiles.	All platforms	63

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
ONEPolicy Rules per Role/ Profile—maximum number of rules per role/policy.	ExtremeSwitching 5320	IPv4 Rules: 1,024 IPv6 Rules: 0 MAC Rules: 0 L2 Rules: 952
	ExtremeSwitching 5420-F, Extreme 7520, 7720	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440
	ExtremeSwitching 5720-MW	IPv4 Rules: 1,536 IPv6 Rules: 1,536 MAC Rules: 1,536 L2 Rules: 1,464
	ExtremeSwitching 5720-MXW	IPv4 Rules: 2,048 IPv6 Rules: 2,048 MAC Rules: 2,048 L2 Rules: 1 ,976
	ExtremeSwitching 5420-M, 5520	IPv4 Rules: 1,024 IPv6 Rules: 1,024 MAC Rules: 1,024 L2 Rules: 952
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch only with TCI-Overwrite enabled.	ExtremeSwitching 5520, 5720	1,024
	ExtremeSwitching 5320, 5420, Extreme 7520, 7720	512
	Stacking	Depends on the stack nodes, but the maximum is 1,024.

Table 7: Supported Limits for the Base 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.	Stacking	1,536–65,534
	Extreme 7520, 7720	24,576
	ExtremeSwitching 5320, 5420	768
	ExtremeSwitching 5720	12,288
	ExtremeSwitching 5520	9,216
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 5320, 5420	768
	Extreme 7520, 7720	24,576
	ExtremeSwitching 5720	12,288
	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 5320, 5420, Extreme 7520, 7720	512
	ExtremeSwitching 5520, 5720	1,024
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	ExtremeSwitching 5320, 5420-F, Extreme 7520, 7720	1,976
	ExtremeSwitching 5720-MW	6,072
	ExtremeSwitching 5720-MXW	8,120
	ExtremeSwitching 5420-M, 5520	4,024
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	ExtremeSwitching 5420-M, 5520	1,024
	ExtremeSwitching 5420-F, Extreme 7520, 7720	512
	ExtremeSwitching 5720-MW	1,536
	ExtremeSwitching 5720-MXW	2,048
	ExtremeSwitching 5320	N/A
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	ExtremeSwitching 5420-M. 5520	1,024
	ExtremeSwitching 5420-F, Extreme 7520, 7720	512
	ExtremeSwitching 5720-MW	1,536
	ExtremeSwitching 5720-MXW	2,048
	ExtremeSwitching 5320	N/A

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
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 5320, 5420-F, 5520	1,024
	ExtremeSwitching 5720-MW	1,536
	ExtremeSwitching 5720-MXW	2,048
	ExtremeSwitching 5420-M, Extreme 7520, 7720	512
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/ deny traffic classification rules (ethertype/port).	ExtremeSwitching 5320, 5420-M, 5520	952
	ExtremeSwitching 5720-MW	1,464
	ExtremeSwitching 5720-MXW	1,976
	ExtremeSwitching 5420-F, Extreme 7520, 7720	440
OnePolicy Maximum number of rules supported in AccessList mode—maximum number of rules in AcessList mode.	Extreme 7520, 7720	3,512
	ExtremeSwitching 5320, 5420-F	4,024
	ExtremeSwitching 5420-M	8,120
	ExtremeSwitching 5720-MW	12,216
	ExtremeSwitching 5720-MXW	16,312
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching 5320, 5420, 5520, 5720	8
	Extreme 7520, 7720	64
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	All platforms	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching 5520	5,000
	ExtremeSwitching 5720, Extreme 7520, 7720	10,000
	ExtremeSwitching 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 5520, 5720, Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420	1,600
OSPFv2 inter-vr or leaking routes—recommended maximum number of inter-vr routes contained in an OSPF LSDB.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420	1,600

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	All platforms	4
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	400
	ExtremeSwitching 5320, 5420	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	All platforms	4
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching 5520	50
	ExtremeSwitching 5720, Extreme 7520, 7720	100
	ExtremeSwitching 5320, 5420	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	32
	ExtremeSwitching 5320, 5420	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching 5520	16
	ExtremeSwitching 5720, Extreme 7520, 7720	100
	ExtremeSwitching 5320, 5420	12
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching 5520, 5720-MXW, Extreme 7520, 7720	10,000
	ExtremeSwitching 5320, 5420, 5720-MW	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching 5520	3,000
	ExtremeSwitching 5720, Extreme 7520, 7720	4,000
	ExtremeSwitching 5320, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	All platforms	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	All platforms	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	16
	ExtremeSwitching 5320, 5420	12

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	All platforms	N/A
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	All platforms	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	All platforms	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	All platforms	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	All platforms	145
PIM IPv4 Limits—static rendezvous points.	All platforms	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	All platforms	N/A
PIM IPv6 Limits—maximum number of multicast sources per group.	All platforms	1,750
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	All platforms	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	All platforms	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	All platforms	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	All platforms	70
PIM IPv6 Limits—static rendezvous points.	All platforms	32

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	All platforms	256 [o]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	All platforms	32 [o]
Port-specific VLAN tags—maximum number of port-specific VLAN tags.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520, 5720, Extreme 7520, 7720	N/A 1,023
Port-specific VLAN tags—maximum number of port-specific VLAN tag ports.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520, 5720, Extreme 7520, 7720	N/A 4,000
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720 Extreme 7520, 7720	36 71
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 5320, 5420, 5520, 5720 Extreme 7520, 7720	960 1,024
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching 5320, 5420, 5520, 5720 Extreme 7520, 7720	960 1,280
Route policies—suggested maximum number of lines in a route policy file.	All platforms	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	All platforms	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	All platforms	256
RIPng learned routes—maximum number of RIPng routes.	All platforms	3,000

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	64
	ExtremeSwitching 5320-24T/P, 5320-16P	32
Spanning Tree PVST+—maximum number of port mode PVST domains. **Note:** For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, for an ExtremeSwitching switch that supports 256 PVST domains (maximum) and 4,096 STP ports (maximum), the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching 5320, 5420, 5520, 5720	128
	Extreme 7520, 7720	384
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	64
	ExtremeSwitching 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 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	600
	ExtremeSwitching 5320-24T/P, 5320-16P	256
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	1,024
	ExtremeSwitching 5320-24T/P, 5320-16P	512
Spanning Tree (802.1d domains)—maximum number of 802.1d domains per port.	All platforms	1
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	4,096
	ExtremeSwitching 5320-24T/P, 5320-16P	2,048
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720	1,024
	ExtremeSwitching 5320-24T/P, 5320-16P	600

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	All platforms	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	All platforms	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	All platforms	16
Syslog targets—maximum number of configurable Syslog targets.	All platforms	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	All platforms	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320-24T/P, 5320-16P	63 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 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320-24T/P, 5320-16P	960 * 16 (local-only VRs)
Virtual router protocols per VR—maximum number of routing protocols per VR.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320-24T/P, 5320-16P	8 N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320-24T/P, 5320-16P	64 N/A
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	All platforms	1,000

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
VLANs—includes all VLANs. **Note:** Only 4,092 user-configurable VLANs are supported. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	All platforms	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	All platforms	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching 5320-48T/P, 5420 ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5520, 5720, Extreme 7520, 7720	1,533 509 2,048
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching 5320 ExtremeSwitching 5420 ExtremeSwitching 5520, 5720, Extreme 7520, 7720	53,328 60,000 131,585
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with the default license.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320, 5420	32 3
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	All platforms	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720 Extreme 7520, 7720	36 71
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 5320, 5420, 5520, 5720 Extreme 7520, 7720	960 1,024

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching 5320, 5420, 5520, 5720 Extreme 7520, 7720	960 2,046
VMAN CEP—maximum number of CVIDs. **Note:** With 75% hash table utilization.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520, 5720	768 9,000
VRRP (v2/v3-IPv4) (maximum instances)—maximum number of VRRP instances for a single switch. **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):** All platforms **Scaled Mode (with groups):** ExtremeSwitching 5720, Extreme 7520, 7720 ExtremeSwitching 5320, 5420, 5520 **Sliced Mode:** All platforms	 511 2,048 1,000 511
VRRP (v3-IPv6) (maximum instances)—maximum number of VRRP instances for a single switch. (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):** All platforms **Scaled Mode (with groups):** ExtremeSwitching 5720, Extreme 7520, 7720 ExtremeSwitching 5320, 5420, 5520	 511 2,048 1,000
VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch.	All platforms	255
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN.	All platforms	255

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)—maximum number of ping tracks per VLAN.	All platforms	8
VRRP (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances.	All platforms	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.	All platforms	8 (20 centisecond or 1 second hello interval)
VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)—maximum number of IP route tracks per VLAN.	All platforms	8
VRRP (v2/v3-IPv4/IPv6)—maximum number of VLAN tracks per VLAN.	All platforms	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. **Note:** On ExtremeSwitching 5520 and 5420 switches, every VNET reduces this limit by 1. Every (VPLS/PSTag VLAN) + port reduces the limit by 1 on all platforms. Every VXLAN Underlay Multicast Tunnel reduces this limit by 1.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320, 5420	2,048–4,000 200-375

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
VXLAN—maximum tenant VLANs plus port combinations Note: Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	ExtremeSwitching 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320, 5420	4,096 200-375
VXLAN—maximum static MAC to IP bindings. Note: Every FDB entry configured reduces this limit by 1.	All platforms	64,000
VXLAN—maximum RTEP IP addresses	All platforms	512
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	ExtremeSwitching 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320, 5420	4,000 375
VXLAN—or replicator role, maximum number of attached leafs per switch.	All platforms	256
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.	All platforms	10 with 100 DACLs
XNV authentication—maximum number of VMs that can be processed (combination of local and network VMs).	All platforms	2,048
XNV database entries—maximum number of VM database entries (combination of local and network VMs).	All platforms	16,000
XNV database entries—maximum number of VPP database entries (combination of local and network VPPs).	All platforms	2,048

Table 7: Supported Limits for the Base License (continued)

Metric	Product	Limit
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs /local VMs).	All platforms	2,048
XNV local VPPs—maximum number of XNV local VPPs.	All platforms	2,048 ingress 512 egress
XNV policies/dynamic ACLs—maximum number of policies/dynamic ACLs that can be configured per VPP.	All platforms	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs. P	All platforms	2,048 ingress 512 egress

Premier License Limits

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

Table 8: Supported Limits for the Premier License

Metric	Product	Limit
Anycast RP Using PIM—maximum number of IPv4 Anycast RP set per VR.	All platforms	32
Anycast RP Using PIM—maximum number of IPv6 Anycast RP set per VR.	All platforms	32
Anycast RP Using PIM—RP peers per Anycast RP set.	All platforms	10
BGP (aggregates)—maximum number of BGP aggregates.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320	256 204
BGP (networks)—maximum number of BGP networks.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720 ExtremeSwitching 5320	1,024 820

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
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 5420, 5520	128
	ExtremeSwitching 5720, Extreme 7520, 7720	300
	ExtremeSwitching 5320	100
BGP (peer groups)—maximum number of BGP peer groups.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	64
	ExtremeSwitching 5320	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	256
	ExtremeSwitching 5320	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	1,024
	ExtremeSwitching 5320	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	ExtremeSwitching 5520, 5720-MXW, Extreme 7520, 7720	25,000
	ExtremeSwitching 5320, 5420, 5720-MW	20,000
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	ExtremeSwitching 5420, 5520, 5720-MXW, Extreme 7520, 7720 (at default)	25,000
	ExtremeSwitching 5320, 5720-MW	20,000
	ExtremeSwitching 5720-MW (with ALPM enabled)	163,000
	ExtremeSwitching 5720-MXW (with ALPM enabled)	288,000
	ExtremeSwitching 5520 (with ALPM enabled)	80,000
BGP (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching 5420, 5520, 5720-MXW, Extreme 7520, 7720	75,000
	ExtremeSwitching 5320, 5720-MW	60,000
BGP ECMP—maximum number of equal cost paths per multipath for BGP and BGPv6.	ExtremeSwitching 5320, 5420, 5520, Extreme 7520, 7720	8
	ExtremeSwitching 5720	64

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
BGPv6 (unicast address-family routes)—maximum number of unicast address family routes.	ExtremeSwitching 5420, 5520, 5720-MW	6,000
	ExtremeSwitching 5720-MW (with ALPM enabled)	107,000
	ExtremeSwitching 5720-MXW, Extreme 7520, 7720	10,000
	ExtremeSwitching 5720-MXW (with ALPM enabled)	213,000
	ExtremeSwitching 5320	4,800
	ExtremeSwitching 5520 (with ALPM enabled)	40,000
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching 5420, 5520, 5720-MW	18,000
	ExtremeSwitching 5720-MXW, Extreme 7520, 7720	30,000
	ExtremeSwitching 5320	14,000
EVPN EVI instances—maximum number of EVI instances.	All platforms	1,024
GRE Tunnels—maximum number of GRE tunnels.	All platforms	255
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	All platforms	128
IS-IS ECMP—maximum number of equal cost paths per multipath for IS-IS.	All platforms	2, 4, or 8
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	All platforms	255
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	All platforms	256
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	All platforms	20,000
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.	All platforms	25,000

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	All platforms	25,000
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.	All platforms	20,000
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.	All platforms	10,000
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	All platforms	10,000
IS-IS IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a L1/l2 router.	All platforms	10,000
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.	All platforms	20,000
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.	All platforms	20,000
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.	All platforms	20,000

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch—maximum number of VCCV enabled VPLS VPNs.	ExtremeSwitching 5520, Extreme 7520, 7720	16
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: VPLS MAC addresses—maximum number of MAC addresses learned by a switch.	ExtremeSwitching 5520	64,000
	Extreme 7520, 7720	140,000
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	ExtremeSwitching 5520, Extreme 7520, 7720	1,023
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: VPLS peers—maximum number of VPLS peers per VPLS instance.	ExtremeSwitching 5520, Extreme 7520, 7720	64
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: LDP pseudowires—maximum number of pseudowires per switch.	ExtremeSwitching 5520	4,000
	Extreme 7520, 7720	7,000
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: static pseudowires—maximum number of static pseudowires per switch.	ExtremeSwitching 5520	4,000
	Extreme 7520, 7720	7,000
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: Virtual Private Wire Service (VPWS) VPNs—maximum number of virtual private networks per switch.	ExtremeSwitching 5520	1,023
	Extreme 7520, 7720	4,090
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE interfaces—maximum number of interfaces.	ExtremeSwitching 5520, Extreme 7520, 7720	32
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	ExtremeSwitching 5520, Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	ExtremeSwitching 5520, Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	ExtremeSwitching 5520, Extreme 7520, 7720	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
MPLS RSVP-TE paths—maximum number of paths.	ExtremeSwitching 5520	1,000
	Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	ExtremeSwitching 5520	1,000
	Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	ExtremeSwitching 5520, Extreme 7520, 7720	64
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	ExtremeSwitching 5520, Extreme 7520, 7720	128
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	ExtremeSwitching 5520, Extreme 7520, 7720	64
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	ExtremeSwitching 5520, Extreme 7520, 7720	2,048
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	ExtremeSwitching 5520, Extreme 7520, 7720	128
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	ExtremeSwitching 5520, Extreme 7520, 7720	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch.	ExtremeSwitching 5520, Extreme 7520, 7720	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS static egress LSPs—maximum number of static egress LSPs.	ExtremeSwitching 5520	4,000
	Extreme 7520, 7720	8,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS static ingress LSPs—maximum number of static ingress LSPs.	ExtremeSwitching 5520, Extreme 7520, 7720	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS static transit LSPs—maximum number of static transit LSPs	ExtremeSwitching 5520, Extreme 7520, 7720	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
MSDP active peers—maximum number of active MSDP peers.	All platforms	64
MSDP SA cache entries—maximum number of entries in SA cache.	ExtremeSwitching 5320, 5420F	6,000
	ExtremeSwitching 5420M	8,000
	ExtremeSwitching 5520, 5720, Extreme 7520, 7720	14,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	All platforms	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching 5320, 5420, 5520	8
	ExtremeSwitching 5720	64
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	All platforms	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching 5420, 5520	5,000
	ExtremeSwitching 5720	10,000
	ExtremeSwitching 5320	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 5520, 5720, Extreme 7520, 7720	2,000
	ExtremeSwitching 5320, 5420	1,600
OSPFv2 inter-vr or leaking routes—recommended maximum number of inter-vr routes contained in an OSPF LSDB.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	2,000
	ExtremeSwitching 5320	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	400
	ExtremeSwitching 5320	320
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	400
	ExtremeSwitching 5320	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	128
	ExtremeSwitching 5320	96

Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching 5420, 5520	50
	ExtremeSwitching 5720, Extreme 7520, 7720	100
	ExtremeSwitching 5320	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	32
	ExtremeSwitching 5320	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching 5420, 5520	16
	ExtremeSwitching 5720, Extreme 7520, 7720	100
	ExtremeSwitching 5320	12
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching 5520, 5720-MXW, Extreme 7520, 7720	10,000
	ExtremeSwitching 5420	6,000
	ExtremeSwitching 5320, 5720-MW	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching 5520	3,000
	ExtremeSwitching 5320, 5720, Extreme 7520, 7720	4,000
	ExtremeSwitching 5420	6,000
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	256
	ExtremeSwitching 5320	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	64
	ExtremeSwitching 5320	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching 5420, 5520, 5720, Extreme 7520, 7720	16
	ExtremeSwitching 5320	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	All platforms	255
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	All platforms	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	All platforms	3,000 (depends on policy file limits)

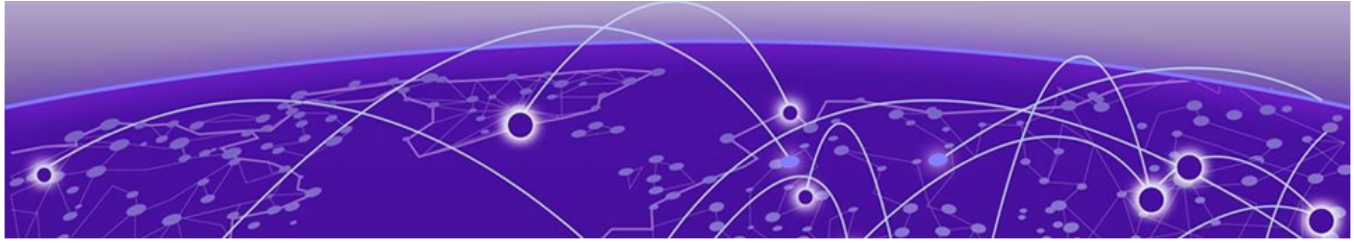
Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast sources per group.	All platforms	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	All platforms	145
PIM IPv4 Limits—static rendezvous points.	All platforms	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	All platforms	255
PIM IPv6 Limits—maximum number of multicast sources per group.	All platforms	1,750
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	All platforms	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	All platforms	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	All platforms	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	All platforms	70
PIM IPv6 Limits—static rendezvous points.	All platforms	32

Notes for Limits Tables

[a] The table shows the total available. When installing ACL rules bound to a set of ports, rules are replicated for each port if there are ACL counters and counter compression is not enabled, or if the ports are Extended Edge Switching extended ports.
[c] When there are BFD sessions with minimal timer, sessions with default timer should not be used.
[f] Effective capacity varies based on actual MAC addresses and VLAN IDs used and hash algorithm selected.

[g] Based on "configure forwarding internal-tables more l2".
[h] Based on "configure forwarding internal-tables more l3-and-ipmc".
[j] The limit depends on setting configured with configure iproute reserved-entries.
[m] The IPv4 and IPv6 multicast entries share the same hardware tables, so the effective number of IPv6 multicast entries depends on the number of IPv4 multicast entries present and vice versa.
[n] If IGMP and MLD are simultaneously configured on the switch, the number of effective subscribers supported are lessened accordingly.
[o] The total of all PBR next hops on all flow redirects should not exceed 4,096.
[p] The number of XNV authentications supported based on system ACL limitations.
[q] Based on "configure forwarding internal-tables more routes".
[r] Based on `configure forwarding internal-tables more routes ipv6-mask-length 128`.
[s] Based on `configure forwarding internal-tables more l3-and-ipmc` or `configure forwarding internal-tables l2-and-l3`.



Open Issues, Known Behaviors, and Resolved Issues

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

Open Issues

The following are new open issues for supported features found in version 32.5.

Table 9: Open Issues in 32.5

Defect Number	Description
General	
EXOS-34354	ExtremeCloud IQ configuration push and pull will not complete using IPv6 configuration on the switch. Workaround: It is recommended to run version 32.5.1-Patch1-1, where this issue is resolved.

Known Behaviors

There are no known issues in this version.

Resolved Issues in Switch Engine 32.5

The following issues were resolved in Switch Engine 32.5. Version 32.5 includes all fixes up to and including versions 31.6, 31.7, 32.1, 32.2, 32.3, and 32.4.

Table 10: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 32.5

Defect Number	Description
General	
CFD-9524	LACP port is not added to aggregator after flap in MLAG.

Table 10: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 32.5 (continued)

Defect Number	Description
EXOS-32890	The default FEC configuration is missing for some ports.
EXOS-32924	The stacking link status and stacking link speeds are not correct when polled using OIDs 1.3.6.1.2.1.2.2.1 and 1.3.6.1.2.1.31.1.1.
EXOS-33022	IP Address is returned in reverse order when IP-MIB is polled.
EXOS-33063	There is a delay in displaying the output of the **`show ports forward-error-correction`** command for not-present ports.
EXOS-33197	HAL process crash occurs after flapping BFD session.
EXOS-33290	Local authentication failover doesn't work when using Chalet.
EXOS-33314	STP fails to block loop when using Policy admin profile.
EXOS-33516	The SNMP trap source IP address configured using SNMP set requests is not saved to the stack backup and is lost if the stack's primary node reboots.
EXOS-33619	MLAG can be enabled on a cascade port in a VPEX+Stacking environment.
EXOS-33633	Need support for RADIUS port bounce VSA.
EXOS-33657	Error log needs to be displayed when OnePolicy ACL cannot be installed in the hardware.
EXOS-33676	End client is accessible even though it fails netlogin authentication.
EXOS-33930	10203 FORMERICAOE optics flapping after changing link speed to 10G.
EXOS-33931	An error occurs when enabling MACsec on the primary node of a stack.
EXOS-33934	The following error message displays in the switch after restart:`<Erro:cm.sys.LoadApplCfgObjFail> Slot-1: "exsshd" application failed to load "exsshdPrivKey" configuration object: Error reading SSH key.`