Switch Engine Release Notes

Software Version 32.2

Table of Contents

Preface

Read the following topics to learn about:

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

Conventions

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

Text Conventions

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

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

Table 1: Notes and warnings

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

Table 2: Text

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

Table 3: Command syntax

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

Platform-Dependent Conventions

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

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

To send feedback, do either of the following:

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

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

Help and Support

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

Extreme Portal

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

The Hub

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

Call GTAC

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

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

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

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

Subscribe to Product Announcements

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

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

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

Related Publications

Switch Engine Publications

- *Switch Engine 32.2 Command Reference Guide*
- *Switch Engine 32.2 Feature License Requirements*
- *Switch Engine 32.2 User Guide*
- *Switch Engine 32.2 Release Notes*
- *ExtremeXOS and Switch Engine 32.2 SNMP Traps Reference*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*
- *Extreme Optics Compatibility*
- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*

Open Source Declarations

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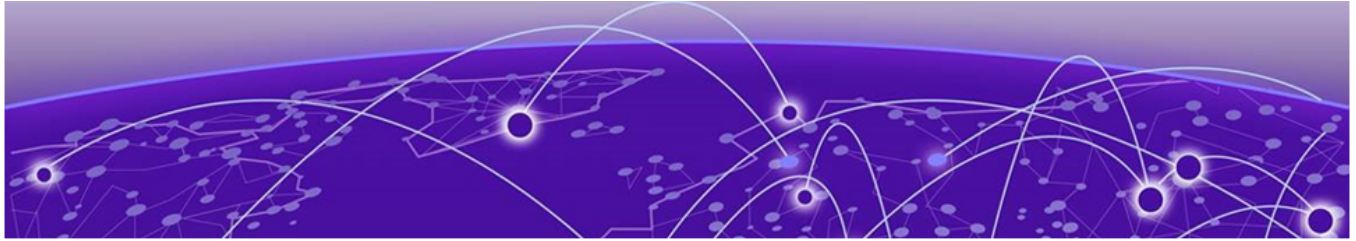
Overview

These release notes document Switch Engine 32.2, which adds features and resolves software deficiencies.
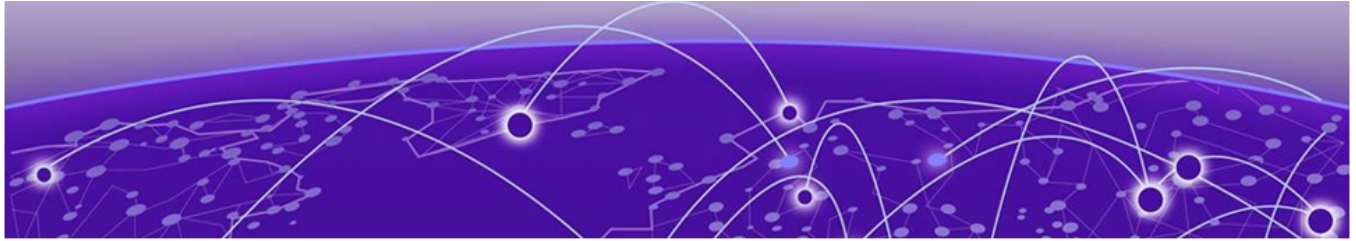
Security Information

The following section covers important security information for Switch Engine 32.2.

Linux Kernel

Switch Engine 32.2 uses Linux Kernel 5.4.

OpenSSL Version

Switch Engine 32.2 uses FIPS openssl-fips-2.0.16.
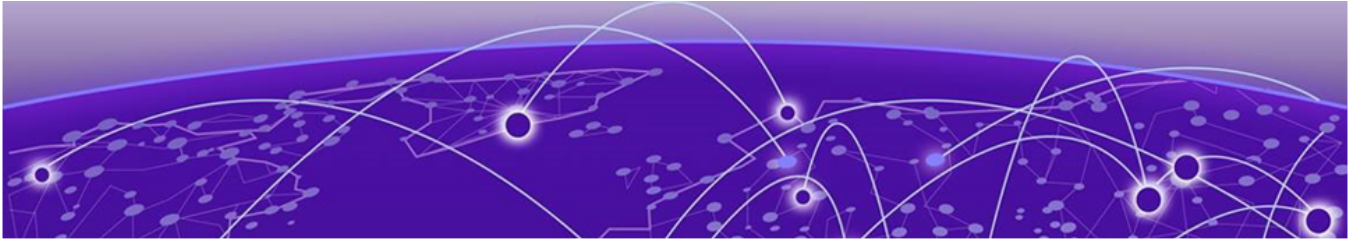
Upgrading Switch Engine

For instructions about upgrading Switch Engine software, see *Software Upgrade and Boot Options* in *Switch Engine 32.2 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.
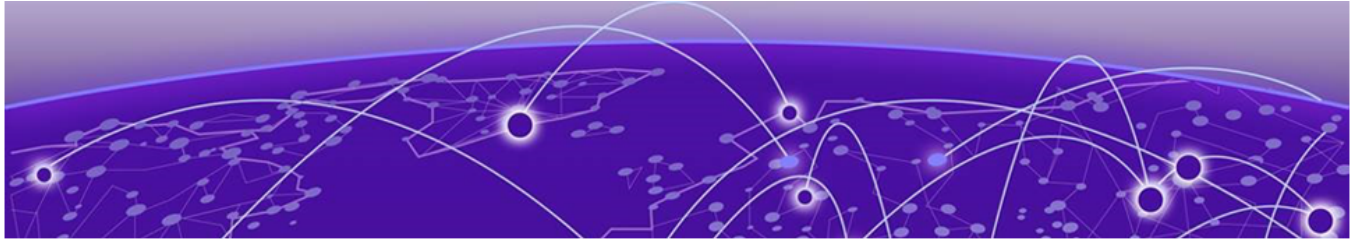
Newly Purchased Switches Require Software Upgrade

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 32.2 User Guide*.
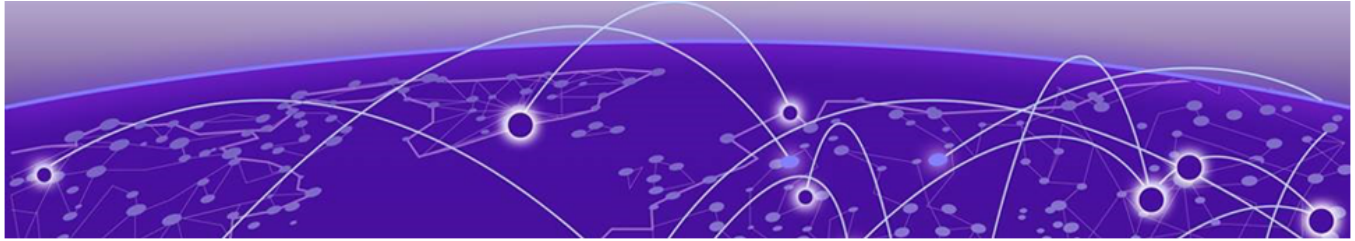
Default Switch Engine™ Settings

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
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.
ESRP	Disabled.
Extended Edge Switching (VPEX)	Disabled.
ExtremeCloud IQ	Enabled
FEC	Enabled on Native 25Gb ports.

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

Table 4: Default Switch Engine Settings (continued)

Feature	31.6 and later
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.
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.

Table 4: Default Switch Engine Settings (continued)

Feature	31.6 and later
SNMP server	Disabled. [a]
SSH	Disabled.
Stacking-support	Enabled.
Stacking auto-discovery	Enabled.
STP	Enabled.
Syslog	Disabled.
TACACS	Disabled.
Telnet	Disabled. [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]
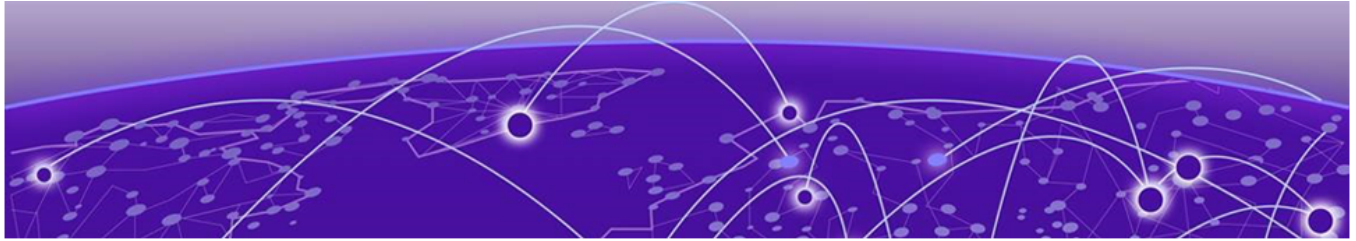
Switch Engine Image File Names

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	`onie` Example: `onie-32.1.1.6.x86_64.xos`
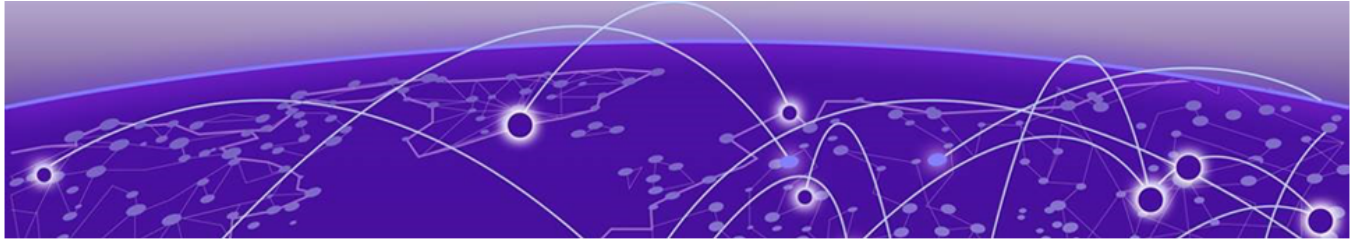
New and Corrected Features in Switch Engine 32.2

This section lists the new and corrected features supported in the 32.2 software:

Digital Twin

Digital Twin is a Virtual Machine (VM) that simulates specific physical switch models. ExtremeCloud IQ can create Digital Twin switches running Switch Engine. For more information, refer to the ExtremeCloud IQ documentation at https://www.extremenetworks.com/support/documentation/extremecloud-iq/.

Flood to VLAN Filters for mDNS, LLMNR, and UPnP Protocols

Version 32.2 introduces support for flood to VLAN Filters for mDNS, LLMNR, and UPnP protocols. This feature enables you to create filters that forward to VLAN for these three protocol packets on both standalone switches and stacks.

When **flood** to VLAN is enabled, an actual ACL filter is installed, and one ACL entry is consumed for each of the three protocols.

When in **learn** mode, no ACL filters are installed, and no ACL resources are consumed.

Supported Platforms

This command is available on ExtremeSwitching 5320, 5420, 5520, and 5720 series switches.

New CLI Commands

```
configure forwarding ipmc all [flood | learn]
```

```
configure forwarding ipmc llmnr [flood | learn]

configure forwarding ipmc mdns [flood | learn]

configure forwarding ipmc upnp [flood | learn]
```

Flow Monitor

Flow Monitor provides IP Flow Information Export (IPFIX) and K-Mirror support based on RFC 7011 to collect and export flow records for Universal platforms. Flow Monitor builds on IPFIX by providing additional metering and exporting processes. Flow Monitor enables switches to gather information about flows through different ports on each switch and export the flow records (via UDP) to one or more remote collectors. This information can be used to analyze application and network usage, and monitor real-time network infrastructure.

> **Tip**
> Flow Monitor for Switch Engine version 32.2 is for demonstration purposes only. Full functionality will be available in a future software version.

Supported Platforms

This feature is supported on ExtremeSwitching 5420 and 5520 series switches.

New CLI Commands

The following new commands support Flow Monitor:

```
clear counters flowmon

configure flowmon collector collector_name

configure flowmon group group_name

configure flowmon group group_name [add | delete] collector
collector_name

configure flowmon group group_name [add | delete] key key_name

configure flowmon key key_name ipv4

configure flowmon key key_name ipv6

create flowmon collector collector_name

create flowmon group group_name

create flowmon key key_name

delete flowmon collector collector_name

delete flowmon group group_name
```

```
delete flowmon key key_name

disable flowmon

disable flowmon group group_name

enable flowmon

enable flowmon group group_name

show flowmon

show flowmon collector [collector_name | all] detail

show flowmon group group_name | all] detail

show flowmon group group_name template detail

show flowmon key [key_name | all] detail

show flowmon group group_name statistics no-refresh wide
```

Online Certificate Status Protocol Enhancement

An Online Certificate Status Protocol (OCSP) is performed in order to verify the peer certificate's revocation status (Good/Revoked/Unknown). OCSP is currently used in the following applications:

- SSH-x509v3 based authentication (the peer is an SSH client)
- RADIUS-TLS (the peer is a RADIUS-TLS server)
- Secure-Syslog (the peer is a Syslog server)

Version 32.2 introduces the following enhancement OCSP attributes:

- The OCSP server URL is now configurable and overrides the servers in the AuthorityInformationAccess (AIA) section of the RADIUS TLS server's certificate.
- Different applications can choose to have a different override server.
- One override server per application is acceptable.

Supported Platforms

This command is available on ExtremeSwitching 5320, 5420, 5520, and 5720 series switches.

New CLI Commands

```
configure radius tls ocsp nonce [on | off]

configure radius tls ocsp override [url | none]

configure radius tls ocsp signer ocsp-nocheck [on | off]

configure ssh2 x509v3 ocsp [on | off]

configure ssh2 x509v3 ocsp nonce [on | off]
```

```
configure ssh2 x509v3 ocsp override [url | none]

configure ssh2 x509v3 ocsp signer ocsp-nocheck [on | off]

configure syslog tls ocsp nonce [on | off]

configure syslog tls ocsp override [url | none]

configure syslog tls ocsp signer ocsp-nocheck [on | off]
```

SSH X.509v3 Authentication Using RADIUS

Version 32.2 introduces support for SSH X.509v3 Authentication Using RADIUS. When enabled, the SSH server requests a password from the client during X.509v3 key-certificate authentication. The user name and password received are then sent to Authentication, Authorization, and Accounting (AAA) for authentication. AAA sends these credentials to the RADIUS server for authentication. If the RADIUS server is not configured or is not reachable, then AAA will validate the user name and password through local authentication.

For authentication, you can use Principal Name as the user name in the client's certificate. The 'principalName' (OID: 1.3.18.0.2.4.318) is displayed below the 'otherName' identifier in the 'SubjectAltName' (SAN) extension of the X509v3 key-certificate.

The following is an example of openssl.cnf to generate X509v3 certificate with SAN extension having 'prinicipalName':

```
[ usr_cert ]
# Extensions for client certificates (`man x509v3_config`).
basicConstraints = CA:FALSE
#nsCertType = client, email
#nsComment = "OpenSSL Generated Client Certificate"
subjectKeyIdentifier = hash
authorityKeyIdentifier = keyid,issuer:always
keyUsage = critical, nonRepudiation, digitalSignature, keyEncipherment
extendedKeyUsage = clientAuth, emailProtection
authorityInfoAccess = OCSP;URI:http://ocspserver.extremenetworks.com:2561
subjectAltName = otherName:1.3.18.0.2.4.318;UTF8:exos-admin@sustaining.com
```

Supported Platforms

This command is available on ExtremeSwitching 5320, 5420, 5520, and 5720 series switches.

New CLI Commands

The following new commands support the RADIUS password authentication feature:

```
configure ssh2 x509v3 radius-password-auth [on | off]

configure ssh2 x509v3 username overwrite [on | off]

configure ssh2 x509v3 username strip-domain [on | off]

configure ssh2 x509v3 username use-domain [domain_name | none]
```

ExtremeSwitching X435 to 5520-24X 2.5G over 10G Optics Connection

This feature supports a 2.5G connection between ExtremeSwitching X435 uplink ports and 5520-24X front panel ports. This feature also supports connecting a 5520-24X to another 5520-24X at 2.5G.

Use of this feature requires 10G-SR-SFP300M-ET and 10G-LR-SFP10KM-ET 10G transceivers.

Note
2.5G support is only available with auto-negotiation disabled.

Supported Platforms

This feature is supported on ExtremeSwitching X435 uplink ports and 5520-24X front panel ports only.

Support for TLS v1.2 for Chalet

Chalet has been upgraded to support a more secure TLS v1.2. Support for versions v1.0 and v1.1 has been removed. Removal of previously supported versions prevents the operating system from being flagged as vulnerable.

Python 3 Support

Software version 32.2 adds support for Python 3.8. The support for all earlier versions including 2.7 have been removed. You can use the conversion tool to change your Python 2 scripts to Python 3. See https://docs.python.org/3/howto/pyporting.html for more information.
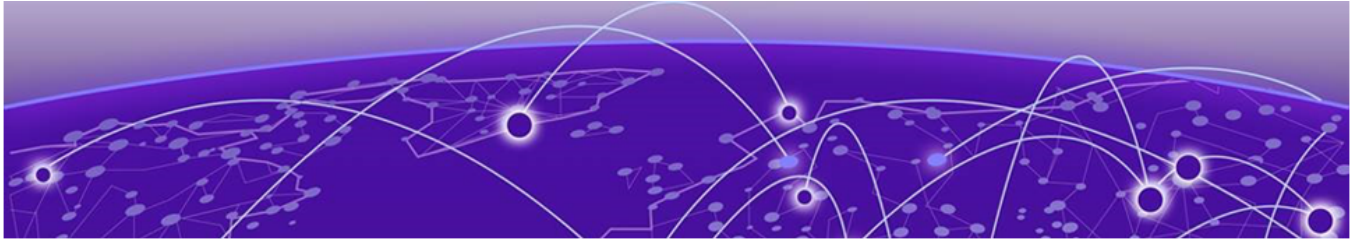
Changing the Network Operating System

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 24)—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 32.2 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 32.2 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

Table 6: Supported Platforms (continued)

Switch Series	Switch Models
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
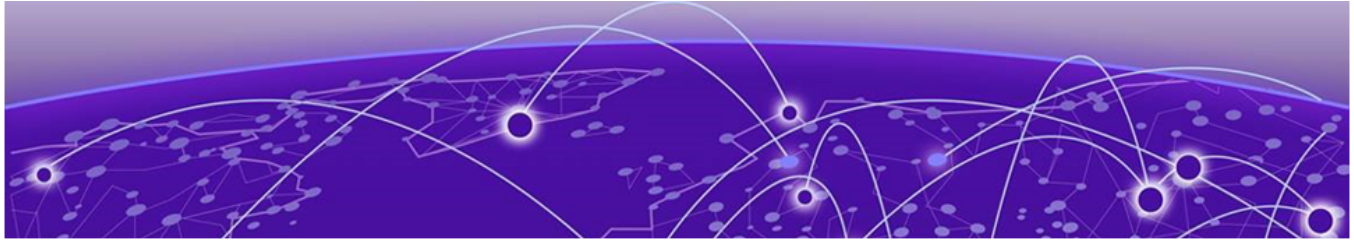
Extreme Hardware/Software Compatibility and Recommendation Matrices

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 Switch Engine releases for Universal Hardware platforms, see *ExtremeXOS and Switch Engine Release Recommendations*.

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

Compatibility with Extreme Management Center or ExtremeCloud IQ - Site Engine

Switch Engine 32.2 is compatible with the version of Extreme Management Center or ExtremeCloud IQ - Site Engine as shown in this table: http://emc.extremenetworks.com/content/common/releasenotes/extended_firmware_support.htm

Switch Engine 32.2 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.
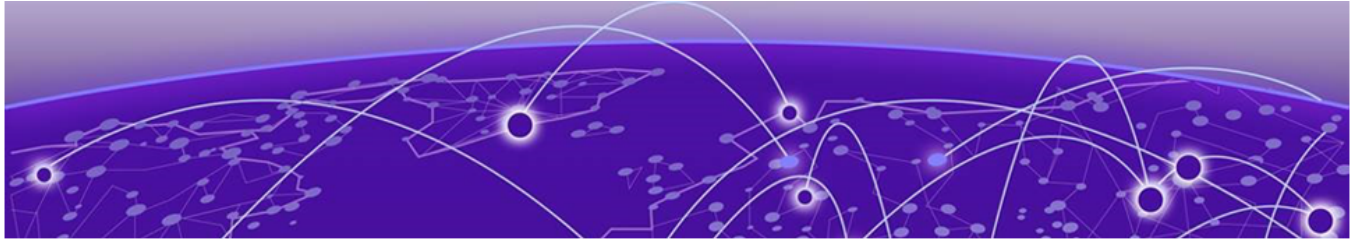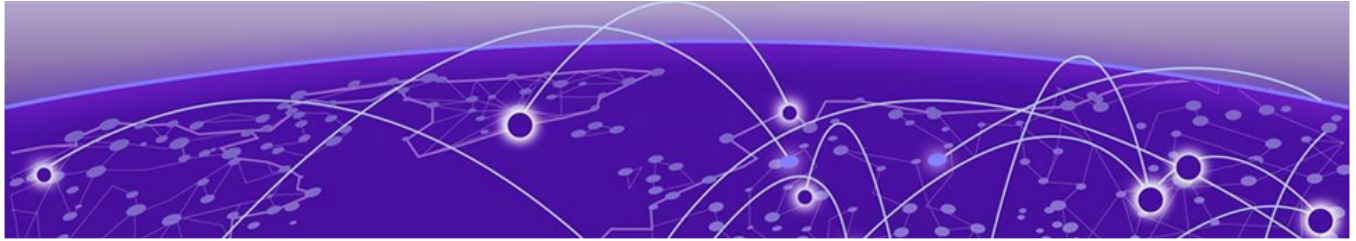
Supported MIBs

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

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

For detailed information on which MIBs and SNMP traps are supported, see the *Extreme Networks Proprietary MIBs* and *MIB Support Details* sections in the *Switch Engine 32.2 User Guide*.

Tested Third-Party Products

The following third-party products have been tested for Switch Engine 32.2.

Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS
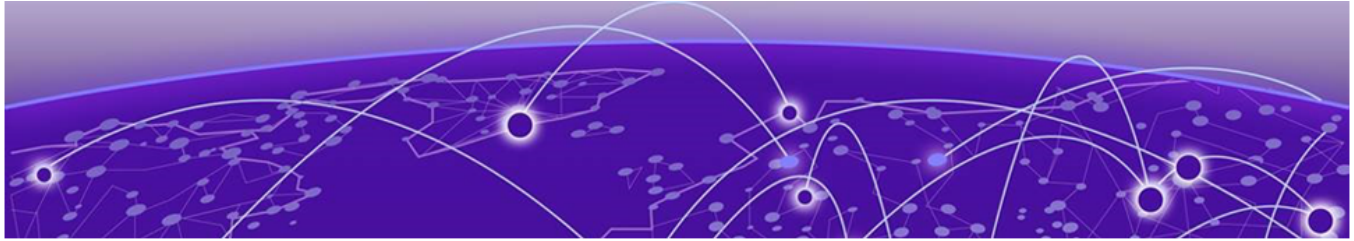
Extreme Switch Security Assessment

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 32.2.

Limits Overview

The limits data is grouped by license level that contains the associated features:
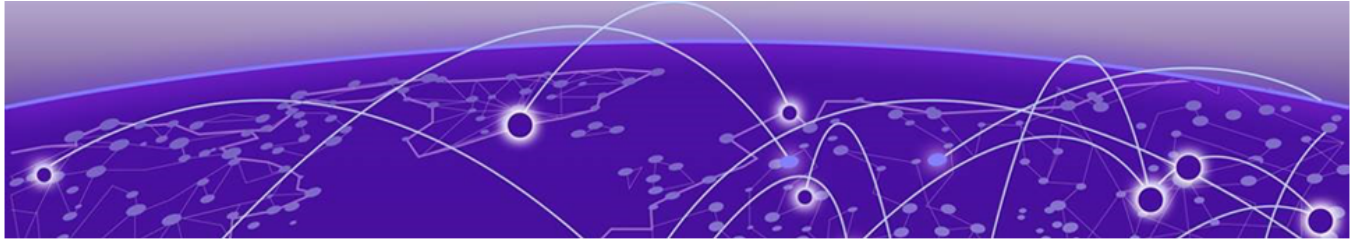
- Base License Limits on page 33
- Premier License Limits on page 59

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.
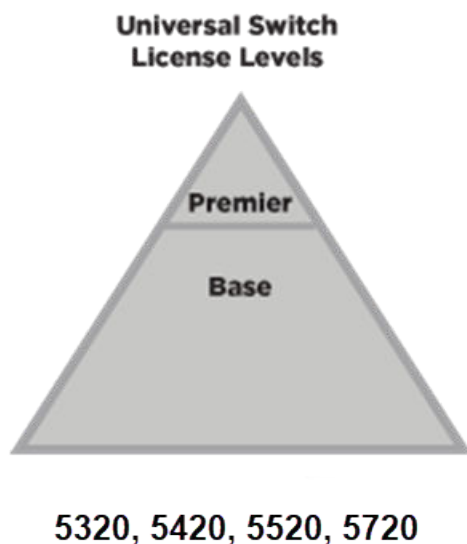
Figure 1: License Levels for non-Universal and Universal Switches

For more information about licenses, see *Switch Engine 32.2 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	6,144 ingress 512 egress
	ExtremeSwitching 5420	6,144 ingress 512 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.	ExtremeSwitching 5320, 5420, 5520, 5720	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	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	1,024 ingress only
	ExtremeSwitching 5320-16P	512 ingress only
Access lists (slices)—number of ACL slices.	ExtremeSwitching 5720	12 ingress 4 egress
	ExtremeSwitching 5320-48T/P, 5420, 5520	18 ingress 4 egress
	ExtremeSwitching 5320-24T/P, 5320-16P	8 ingress 4 egress

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

Metric	Product	Limit
Access lists (slices)—number of ACL slices in first stage (VFP).	ExtremeSwitching 5320, 5420, 5520, 5720	4 ingress only
ACL Per Port Meters—number of meters supported per port.	ExtremeSwitching 5320, 5420, 5520, 5720	16
ACL port ranges.	ExtremeSwitching 5320, 5420, 5520, 5720	32
Meters Packets-Per-Second Capable.	ExtremeSwitching 5320, 5420, 5520, 5720	N/A
AVB (audio video bridging)— maximum number of active streams.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520	1,024 4,096
BFD sessions (Software Mode)— maximum number of BFD sessions.	ExtremeSwitching 5420, 5520, 5720 (default timers—1 sec)	512
BGP (peers)—maximum number of BGP peers.	ExtremeSwitching 5320, 5420, 5520, 5720	2
BGP auto-peering—maximum number of auto-peering nodes and VTEPs.	ExtremeSwitching 5320, 5420, 5520, 5720	64
BGP auto-peering attached IPv4 hosts— maximum number of attached IPv4 hosts.	ExtremeSwitching 5320, 5420, 5520, 5720	64,000
BGP auto-peering attached IPv6 hosts— maximum number of attached IPv6 hosts.	ExtremeSwitching 5320, 5420, 5520, 5720	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 ExtremeSwitching 5320, 5420, 5520	16* 4*
BGP auto-peering maximum IPv4 prefixes with ECMP—Maximum number of IPv4 Network prefixes with ECMP.	ExtremeSwitching 5320, 5420, 5520, 5720	16,000
BGP auto-peering maximum IPv6 prefixes with ECMP—Maximum number of IPv6 Network prefixes with ECMP.	ExtremeSwitching 5320, 5420, 5520, 5720	254
BGP auto-peering MLAG peers —maximum MLAG peers per AutoBGP node.	ExtremeSwitching 5320, 5420, 5520, 5720	1
BGP auto-peering VRFs— maximum number of VRFs.	ExtremeSwitching 5320, 5420, 5520, 5720	64

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

Metric	Product	Limit
BGP auto-peering EVPN instances—maximum EVPN instances.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	ExtremeSwitching 5320, 5420, 5520, 5720	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents	ExtremeSwitching 5320, 5420, 5520, 5720	4,000
Connectivity fault management (CFM)—maximum number or CFM domains.	ExtremeSwitching 5320, 5420, 5520, 5720	8
CFM—maximum number of CFM associations.	ExtremeSwitching 5320, 5420, 5520, 5720	256
CFM—maximum number of CFM up end points.	ExtremeSwitching 5320, 5420, 5520, 5720	32
CFM—maximum number of CFM down end points.	ExtremeSwitching5320, 5420, 5520, 5720	32
CFM—maximum number of CFM remote end points per up/down end point.	ExtremeSwitching 5320, 5420, 5520, 5720	2,000
CFM—maximum number of dot1ag ports.	ExtremeSwitching 5320, 5420, 5520, 5720	128
CFM—maximum number of CFM segments.	ExtremeSwitching 5320, 5420, 5520, 5720	1,000
CFM—maximum number of MIPs.	ExtremeSwitching 5320, 5420, 5520, 5720	256
CLEAR-Flow—total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs.	ExtremeSwitching 5320, 5420, 5720 ExtremeSwitching 5520	8,192 9,215
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)—maximum number of DCBX application TLVs.	ExtremeSwitching 5320, 5420, 5520, 5720	8

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

Metric	Product	Limit
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	ExtremeSwitching 5320, 5420, 5520, 5720	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	2,050

Dynamic ACLs—maximum number of ACLs processed per second.
 	
Note: Limits are load-dependent.
	ExtremeSwitching 5320, 5420, 5520, 5720
	
	   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.	ExtremeSwitching 5720 ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520	128 32 64
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	1,000 2,000
EAPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320, 5420, 5520 ExtremeSwitching 5720	500 2,000
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	4,000 5,000
ERPS domains—maximum number of ERPS domains with or without CFM configured.	ExtremeSwitching 5320, 5420, 5520, 5720	32
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	1,000 2,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching 5320-24T/P, 5320-16P ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	500 2,000
ESRP groups—maximum number of ESRP groups	ExtremeSwitching 5320, 5420, 5520, 5720	32
ESRP domains—maximum number of ESRP domains.	ExtremeSwitching 5320, 5420, 5520, 5720	64

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

Metric	Product	Limit
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	ExtremeSwitching 5320, 5420, 5520, 5720	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	511
	ExtremeSwitching 5320-24T/P, 5320-16P	509
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	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
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	4,094
	ExtremeSwitching 5420	1,024
Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships.	ExtremeSwitching 5520	12,000 in hash mode (default) 131,000 in port-group mode
	ExtremeSwitching 5420	8,750 in hash mode (default) 131,617 in port-group mode

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

Metric	Product	Limit
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching 5320-48P	19,142 pps
	ExtremeSwitching 5420F-48T	21,585 pps
	ExtremeSwitching 5520-24T	18,838 pps
	ExtremeSwitching 5720-MW	27,000 pps
	ExtremeSwitching 5720-MXW	31,000 pps
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching 5320	32,000
	ExtremeSwitching 5420M	65,536
	ExtremeSwitching 5420F	32,768 [f]
	ExtremeSwitching 5520	114,688 [f]
	ExtremeSwitching 5720-MW	163,840 [f]
	ExtremeSwitching 5720-MXW	294,912 [f]
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	ExtremeSwitching 5520, 5720-MW	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	294,912 [g]
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching 5520	4,096
	ExtremeSwitching 5320, 5420	1,024
	ExtremeSwitching 5720	16,000
Identity management—maximum number of Blacklist entries.	ExtremeSwitching 5320, 5420, 5520, 5720	512
Identity management—maximum number of Whitelist entries.	ExtremeSwitching 5320, 5420, 5520, 5720	512
Identity management—maximum number of roles that can be created.	ExtremeSwitching 5320, 5420, 5520, 5720	64
Identity management—maximum role hierarchy depth allowed.	ExtremeSwitching 5320, 5420, 5520, 5720	5
Identity management—maximum number of attribute value pairs in a role match criteria.	ExtremeSwitching 5320, 5420, 5520, 5720	16

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

Metric	Product	Limit
Identity management—maximum number of child roles for a role.	ExtremeSwitching 5320, 5420, 5520, 5720	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	ExtremeSwitching 5320, 5420, 5520, 5720	8
Identity management—maximum number of LDAP servers that can be configured.	ExtremeSwitching 5320, 5420, 5520, 5720	8
Identity management—maximum number of Kerberos servers that can be configured.	ExtremeSwitching 5320, 5420, 5520, 5720	20
Identity management—maximum database memory size.	ExtremeSwitching 5320, 5420, 5520, 5720	512
Identity management— recommended number of identities per switch. **Note:** Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	ExtremeSwitching 5320, 5420, 5520, 5720	100
Identity management— recommended number of ACL entries per identity. **Note:** Number of ACLs per identity, based on system ACL limitation.	ExtremeSwitching 5320, 5420, 5520, 5720	20
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	ExtremeSwitching 5320, 5420, 5520, 5720	500
IGMP snooping per VLAN filters —maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5720 ExtremeSwitching 5520	1,500 4,000 2,500
IGMPv1/v2 SSM-map entries— maximum number of IGMPv1/v2 SSM mapping entries.	ExtremeSwitching 5320, 5420, 5520, 5720	500
IGMPv1/v2 SSM-map entries— maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	ExtremeSwitching 5320, 5420, 5520, 5720	50
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port. [n]	ExtremeSwitching 5320, 5420, 5520, 5720	4,000

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

Metric	Product	Limit
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520	20,000
	ExtremeSwitching 5720-MW	45,000
	ExtremeSwitching 5720-MXW	54,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching 5320, 5420, 5520, 5720	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching 5320, 5420, 5520, 5720	4,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520	20,000
	ExtremeSwitching 5720-MW	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
	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]
	ExtremeSwitching 5720-MXW	172,000 [h]
IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is "maximum."	ExtremeSwitching 5320	10,000
	ExtremeSwitching 5420M models	21,000
	ExtremeSwitching 5420F models	10,000
	ExtremeSwitching 5520	49,000 [h]
	ExtremeSwitching 5720-MW	70,000 [h]
	ExtremeSwitching 5720-MXW	156,000 [h]
IP flow information export (IPFIX)—number of simultaneous flows.	ExtremeSwitching 5320, 5420, 5520, 5720	N/A

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

Metric	Product	Limit
IPv4 remote hosts in hardware with zero LPM routes—maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less.	ExtremeSwitching 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]
	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
	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]
	ExtremeSwitching 5720-MW	163,000 [q]
	ExtremeSwitching 5720-MXW	288,000 [q]
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	ExtremeSwitching 5320, 5420, 5520, 5720	255
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	ExtremeSwitching 5320, 5420, 5520, 5720	1 (per virtual router)
IPv6 addresses on an interface —maximum number of IPv6 addresses on an interface.	ExtremeSwitching 5320, 5420, 5520, 5720	255
IPv6 addresses on a switch —maximum number of IPv6 addresses on a switch.	ExtremeSwitching 5320, 5420, 5520, 5720	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]
	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
	ExtremeSwitching 5720-MW	107,000 [q]
	ExtremeSwitching 5720-MXW	213,000 [q]

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

Metric	Product	Limit
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching 5520	40,000 [q]
	ExtremeSwitching 5420	6,000
	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	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	0–128 [r]
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	2,048
IP multicast static routes—maximum number of permanent multicast IP routes.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching 5320, 5420, 5520, 5720	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	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 32.2 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 32.2 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 about RIOT, see *Switch Engine 32.2 User Guide*.	2,046 2,046 2,046 1,022 510 254
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	255
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching 5320, 5420, 5520, 5720	9,216

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

Metric	Product	Limit
Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. **Note:** • The internal lookup table configuration used is "l2-and-l3". • IPv6 and IPv4 L2 IPMC scaling is the same for this mode. • Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are the same.	ExtremeSwitching 5320	32,000
	ExtremeSwitching 5420	64,000
	ExtremeSwitching 5520	32,768
	ExtremeSwitching 5720-MW	49,152
	ExtremeSwitching 5720-MXW	81,920
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	8,000
	ExtremeSwitching 5420M	12,000
	ExtremeSwitching 5420F	6,000
	ExtremeSwitching 5520	43,000
	ExtremeSwitching 5720-MW	61,000
	ExtremeSwitching 5720-MXW	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	4,000
	ExtremeSwitching 5420M	6,000
	ExtremeSwitching 5420F	3,000
	ExtremeSwitching 5520	21,500
	ExtremeSwitching 5720-MW	30,500
	ExtremeSwitching 5720-MXW	55,000

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

Metric	Product	Limit
Load sharing—maximum number of load sharing groups. **Note:** The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.	ExtremeSwitching 5320, 5420, 5520, 5720	128
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching 5320, 5420	8
	For standalone: ExtremeSwitching 5520, 5720	32
	For stacked: ExtremeSwitching 5520, 5720	64
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching 5320, 5420, 5520, 5720	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching 5320, 5420, 5520, 5720	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	ExtremeSwitching 5320, 5420, 5520, 5720	2,048
Maximum mirroring instances.	ExtremeSwitching 5320, 5420, 5520, 5720	4 total, 2 egress
Mirroring (filters)—maximum number of mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	ExtremeSwitching 5320, 5420, 5520, 5720	128
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	ExtremeSwitching 5320, 5420, 5520, 5720	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching 5320, 5420, 5520, 5720	16

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

Metric	Product	Limit
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	55
	ExtremeSwitching 5720	63
	ExtremeSwitching 5420, 5520	59
	Stacking **Note:** Maximum user ports	1
MLAG peers—maximum number of MLAG peers allowed.	ExtremeSwitching 5320, 5420, 5520, 5720	2
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching 5320, 5420	1,500
	ExtremeSwitching 5520	1,000
	ExtremeSwitching 5720	1,500
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	ExtremeSwitching 5320, 5420, 5520, 5720	4,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520	10,000
	ExtremeSwitching 5720-MW	30,000
	ExtremeSwitching 5720-MXW	54,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	ExtremeSwitching 5320, 5420, 5520, 5720	4,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching 5320, 5420, 5520	10,000
	ExtremeSwitching 5720-MW	30,000
	ExtremeSwitching 5720-MXW	54,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching 5320, 5420, 5520, 5720	200
Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries.	ExtremeSwitching5320, 5420, 5520, 5720	500
Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries.	ExtremeSwitching 5320, 5420, 5520, 5720	50
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024

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

Metric	Product	Limit
Network Login—maximum number of clients being authenticated with policy mode enabled with TCI overwrite enabled.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
Network Login VLAN VSAs— maximum number of VLANs a client can be authenticated on at any given time.	ExtremeSwitching 5320, 5420, 5520, 5720	10
Network Service Identifiers (NSI)/VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching 5320, 5420, 5520, 5720	94
Node Alias—maximum number of entries per slot.	ExtremeSwitching 5320, 5420, 5520, 5720	8,192
ONEPolicy Dynamic ACL Rules— maximum number of Dynamic ACLs supported via RADIUS VSA 232 per user in Access-List mode.	ExtremeSwitching5320, 5420, 5520, 5720	64
ONEPolicy Roles/Profiles— maximum number of policy roles/ profiles.	ExtremeSwitching 5320, 5420, 5520, 5720	63
ONEPolicy Rules per Role/Profile —maximum number of rules per role/policy.	ExtremeSwitching 5320, 5420	IPv4 Rules: 1,024 IPv6 Rules: 0 MAC Rules: 0 L2 Rules: 952
	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 5520	4,024

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

Metric	Product	Limit
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch only with TCI-Overwrite enabled.	ExtremeSwitching 5520, 5720	1,024
	ExtremeSwitching 5320, 5420	512
	Stacking	Depends on the stack nodes, but the maximum is 65,535.
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch with TCI-Overwrite disabled. **Note:** The maximum values assume 75% utilization of VLAN-XLATE hash table.	Stacking	1,536–65,534
	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
	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	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	1,976
	ExtremeSwitching 5720-MW	6,072
	ExtremeSwitching 5720-MXW	8,120
	ExtremeSwitching 5520	4,024
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	ExtremeSwitching 5520	1,024
	ExtremeSwitching 5420	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 IPv6 permit/deny traffic classification rules types (ipv6dest).	ExtremeSwitching 5520	1,024
	ExtremeSwitching 5420	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 IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	ExtremeSwitching 5320, 5520	1,024
	ExtremeSwitching 5720-MW	1,536
	ExtremeSwitching 5720-MXW	2,048
	ExtremeSwitching 5420	512
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	ExtremeSwitching 5320, 5520	952
	ExtremeSwitching 5720-MW	1,464
	ExtremeSwitching 5720-MXW	1,976
	ExtremeSwitching 5420	440
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching 5320, 5420, 5520, 5720	8
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching 5320, 5420, 5520, 5720	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching 5520	5,000
	ExtremeSwitching 5720	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	2,000
	ExtremeSwitching 5320, 5420	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching 5320, 5420, 5520, 5720	4
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching 5520, 5720	400
	ExtremeSwitching 5320, 5420	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching 5320, 5420, 5520, 5720	4

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

Metric	Product	Limit
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching 5520	50
	ExtremeSwitching 5720	100
	ExtremeSwitching 5320, 5420	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching 5520, 5720	32
	ExtremeSwitching 5320, 5420	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching 5520	16
	ExtremeSwitching 5720	100
	ExtremeSwitching 5320, 5420	12
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching 5520, 5720-MXW	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	4,000
	ExtremeSwitching 5320, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching 5320, 5420, 5520, 5720	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching 5320, 5420, 5520, 5720	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching 5520, 5720	16
	ExtremeSwitching 5320, 5420	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching 5320, 5420, 5520, 5720	N/A
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching 5320, 5420, 5520, 5720	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching 5320, 5420, 5520, 5720	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching 5320, 5420, 5520, 5720	32

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

Metric	Product	Limit
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching 5320, 5420, 5520, 5720	N/A
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching 5320, 5420, 5520, 5720	1,750
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching 5320, 5420, 5520, 5720	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching 5320, 5420, 5520, 5720	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching 5320, 5420, 5520, 5720	32
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching 5320, 5420, 5520, 5720	256 [O]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching 5320, 5420, 5520, 5720	32 [O]
Port-specific VLAN tags—maximum number of port-specific VLAN tags.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520, 5720	N/A 1,023
Port-specific VLAN tags—maximum number of port-specific VLAN tag ports.	ExtremeSwitching 5320, 5420 ExtremeSwitching 5520, 5720	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	36
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. **Note:** This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	ExtremeSwitching 5320, 5420, 5520, 5720	960

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

Metric	Product	Limit
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching 5320, 5420, 5520, 5720	960
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching 5320, 5420, 5520, 5720	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	ExtremeSwitching 5320, 5420, 5520, 5720	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	ExtremeSwitching 5320, 5420, 5520, 5720	256
RIPng learned routes—maximum number of RIPng routes.	ExtremeSwitching 5320, 5420, 5520, 5720	3,000
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	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
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	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	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	1,024
	ExtremeSwitching 5320-24T/P, 5320-16P	512

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

Metric	Product	Limit
Spanning Tree (802.1d domains) —maximum number of 802.1d domains per port.	ExtremeSwitching 5320, 5420, 5520, 5720	1
Spanning Tree (number of ports) —maximum number of ports including all Spanning Tree domains.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	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	1,024
	ExtremeSwitching 5320-24T/P, 5320-16P	600
SSH (number of sessions)— maximum number of simultaneous SSH sessions.	ExtremeSwitching 5320, 5420, 5520, 5720	8
Static MAC multicast FDB entries —maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching 5320, 5420, 5520, 5720	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching 5320, 5420, 5520, 5720	16
Telnet (number of sessions)— maximum number of simultaneous Telnet sessions.	ExtremeSwitching 5320, 5420, 5520, 5720	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	63
	ExtremeSwitching 5320-24T/P, 5320-16P	16 (local-only VRs)
Virtual router forwarding (VRFs)— maximum number of VRFs that can be created on a switch. **Note:** * Subject to other system limitations.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	960 *
	ExtremeSwitching 5320-24T/P, 5320-16P	16 (local-only VRs)
Virtual router protocols per VR —maximum number of routing protocols per VR.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	8
	ExtremeSwitching 5320-24T/P, 5320-16P	N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	ExtremeSwitching 5320-48T/P, 5420, 5520, 5720	64
	ExtremeSwitching 5320-24T/P, 5320-16P	N/A
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	ExtremeSwitching 5320, 5420, 5520, 5720	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.)	ExtremeSwitching 5320, 5420, 5520, 5720	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching 5320, 5420, 5520, 5720	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching 5320, 5420, 5520, 5720	2,048
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching 5320 ExtremeSwitching 5420 ExtremeSwitching 5520, 5720	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 ExtremeSwitching 5320, 5420	32 3
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	ExtremeSwitching 5320, 5420, 5520, 5720	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	36
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN. **Note:** This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports.	ExtremeSwitching 5320, 5420, 5520, 5720	960
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching 5320, 5420, 5520, 5720	960

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

Metric	Product	Limit
VMAN CEP—maximum number of CVIDs. **Note:** With 75% hash table utilization.	ExtremeSwitching 5320, 5420	768
	ExtremeSwitching 5520, 5720	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):** ExtremeSwitching 5320, 5420, 5520, 5720 **Scaled Mode (with groups):** ExtremeSwitching 5720 ExtremeSwitching 5320, 5420, 5520, **Sliced Mode:** ExtremeSwitching 5320, 5420, 5520, 5720	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):** ExtremeSwitching 5320, 5420, 5520, 5720 **Scaled Mode (with groups):** ExtremeSwitching 5720 ExtremeSwitching 5320, 5420, 5520,	511 2,048 1,000
VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch.	ExtremeSwitching 5320, 5420, 5520, 5720	255
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	255
VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	8
VRRP (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances.	ExtremeSwitching 5320, 5420, 5520, 5720	8 (20 centisecond or 1 second hello interval)

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

Metric	Product	Limit
VRRP (v3-IPv6) (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances.	ExtremeSwitching 5320, 5420, 5520, 5720	8 (20 centisecond or 1 second hello interval)
VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)—maximum number of IP route tracks per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	8
VRRP (v2/v3-IPv4/IPv6)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching 5320, 5420, 5520, 5720	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 ExtremeSwitching 5320, 5420	2,048–4,000 200-375
VXLAN—maximum tenant VLANs plus port combinations **Note:** Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	ExtremeSwitching 5520, 5720 ExtremeSwitching 5320, 5420	4,096 200-375
VXLAN—maximum static MAC to IP bindings. **Note:** Every FDB entry configured reduces this limit by 1.	ExtremeSwitching 5320, 5420, 5520, 5720	64,000
VXLAN—maximum RTEP IP addresses	ExtremeSwitching 5320, 5420, 5520, 5720	512

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

Metric	Product	Limit
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	ExtremeSwitching 5520, 5720 ExtremeSwitching 5320, 5420	4,000 375
VXLAN—or replicator role, maximum number of attached leafs per switch.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	10 with 100 DACLs
XNV authentication—maximum number of VMs that can be processed (combination of local and network VMs).	ExtremeSwitching 5320, 5420, 5520, 5720	2,048
XNV database entries—maximum number of VM database entries (combination of local and network VMs).	ExtremeSwitching 5320, 5420, 5520, 5720	16,000
XNV database entries—maximum number of VPP database entries (combination of local and network VPPs).	ExtremeSwitching 5320, 5420, 5520, 5720	2,048
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs /local VMs).	ExtremeSwitching 5320, 5420, 5520, 5720	2,048
XNV local VPPs—maximum number of XNV local VPPs.	ExtremeSwitching 5320, 5420, 5520, 5720	2,048 ingress 512 egress
XNV policies/dynamic ACLs—maximum number of policies/ dynamic ACLs that can be configured per VPP.	ExtremeSwitching 5320, 5420, 5520, 5720	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs.[p]	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	32
Anycast RP Using PIM—maximum number of IPv6 Anycast RP set per VR.	ExtremeSwitching 5320, 5420, 5520, 5720	32
Anycast RP Using PIM—RP peers per Anycast RP set.	ExtremeSwitching 5320, 5420, 5520, 5720	10
BGP (aggregates)—maximum number of BGP aggregates.	ExtremeSwitching 5520, 5720	256
	ExtremeSwitching 5320, 5420	204
BGP (networks)—maximum number of BGP networks.	ExtremeSwitching 5520, 5720	1,024
	ExtremeSwitching 5320, 5420	820
BGP (peers)—maximum number of BGP peers. **Note:** With default keepalive and hold timers. **Note:** Each BGPv4/BGPv6 peer handles a maximum of 50 routes. **Note:** ECMP should not be enabled for BGP.	ExtremeSwitching 5520	128
	ExtremeSwitching 5720	300
	ExtremeSwitching 5320, 5420	100
BGP (peer groups)—maximum number of BGP peer groups.	ExtremeSwitching 5520, 5720	64
	ExtremeSwitching 5320, 5420	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	ExtremeSwitching 5520, 5720	256
	ExtremeSwitching 5320, 5420	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	ExtremeSwitching 5520, 5720	1,024
	ExtremeSwitching 5320, 5420	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	ExtremeSwitching 5520, 5720-MXW	25,000
	ExtremeSwitching 5320, 5420, 5720-MW	20,000

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

Metric	Product	Limit
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	ExtremeSwitching 5520, 5720-MXW (at default)	25,000
	ExtremeSwitching 5320, 5420, 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 5520, 5720-MXW	25,000
	ExtremeSwitching 5320, 5420, 5720-MW	20,000
BGP ECMP—maximum number of equal cost paths per multipath for BGP and BGPv6.	ExtremeSwitching 5320, 5420, 5520	8
	ExtremeSwitching 5720	64
BGPv6 (unicast address-family routes)—maximum number of unicast address family routes.	ExtremeSwitching 5520, 5720-MW	6,000
	ExtremeSwitching 5720-MW (with ALPM enabled)	107,000
	ExtremeSwitching 5720-MXW	10,000
	ExtremeSwitching 5720-MXW (with ALPM enabled)	213,000
	ExtremeSwitching 5320, 5420	4,800
	ExtremeSwitching 5520 (with ALPM enabled)	40,000
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching 5520, 5720-MW	18,000
	ExtremeSwitching 5720-MXW	24,000
	ExtremeSwitching 5320, 5420	14,000
EVPN EVI instances—maximum number of EVI instances.	ExtremeSwitching 5320, 5420, 5520, 5720	1,024
GRE Tunnels—maximum number of GRE tunnels.	ExtremeSwitching 5320, 5420, 5520, 5720	255
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	ExtremeSwitching 5320, 5420, 5520, 5720	128
IS-IS ECMP—maximum number of equal cost paths per multipath for IS-IS.	ExtremeSwitching 5320, 5420, 5520, 5720	2, 4, or 8
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	ExtremeSwitching 5320, 5420, 5520, 5720	255
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	ExtremeSwitching 5320, 5420, 5520, 5720	256

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

Metric	Product	Limit
IS-IS route origination— recommended maximum number of routes that can be originated by an IS-IS node.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	25,000
IS-IS IPv4 L2 routes— recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	10,000
IS-IS IPv6 L2 routes— recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	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	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
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	ExtremeSwitching 5520	1,023
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: VPLS peers—maximum number of VPLS peers per VPLS instance.	ExtremeSwitching 5520	64
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: LDP pseudowires— maximum number of pseudowires per switch.	ExtremeSwitching 5520	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
L2 VPN: static pseudowires— maximum number of static pseudowires per switch.	ExtremeSwitching 5520	4,000
	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
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE interfaces— maximum number of interfaces.	ExtremeSwitching 5520	32
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE ingress LSPs— maximum number of ingress LSPs.	ExtremeSwitching 5520	2,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE egress LSPs— maximum number of egress LSPs.	ExtremeSwitching 5520	2,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE transit LSPs— maximum number of transit LSPs.	ExtremeSwitching 5520	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE paths—maximum number of paths.	ExtremeSwitching 5520	1,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	ExtremeSwitching 5520	1,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	ExtremeSwitching 5520	64
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	ExtremeSwitching 5520	128
	ExtremeSwitching 5320, 5420, 5720	N/A

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

Metric	Product	Limit
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	ExtremeSwitching 5520	64
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	ExtremeSwitching 5520	2,048
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	ExtremeSwitching 5520	128
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	ExtremeSwitching 5520	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	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS static egress LSPs—maximum number of static egress LSPs.	ExtremeSwitching 5520	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS static ingress LSPs—maximum number of static ingress LSPs.	ExtremeSwitching 5520	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MPLS static transit LSPs—maximum number of static transit LSPs	ExtremeSwitching 5520	4,000
	ExtremeSwitching 5320, 5420, 5720	N/A
MSDP active peers—maximum number of active MSDP peers.	ExtremeSwitching 5320, 5420, 5520, 5720	64
MSDP SA cache entries—maximum number of entries in SA cache.	ExtremeSwitching 5320, 5420F	6,000
	ExtremeSwitching 5420M	8,000
	ExtremeSwitching 5520, 5720	14,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	ExtremeSwitching 5320, 5420, 5520, 5720	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.	ExtremeSwitching 5320, 5420, 5520, 5720	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching 5520	5,000
	ExtremeSwitching 5720	10,000
	ExtremeSwitching 5320, 5420	4,000

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

Metric	Product	Limit
OSPFv2 inter- or intra-area routes —recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching 5520, 5720	2,000
	ExtremeSwitching 5320, 5420	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching 5520, 5720	400
	ExtremeSwitching 5320, 5420	320
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching 5520, 5720	400
	ExtremeSwitching 5320, 5420	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching 5520, 5720	128
	ExtremeSwitching 5320, 5420	96
OSPFv2 routers in a single area— recommended maximum number of routers in a single OSPF area.	ExtremeSwitching 5520	50
	ExtremeSwitching 5720	100
	ExtremeSwitching 5320, 5420	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching 5520, 5720	32
	ExtremeSwitching 5320, 5420	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching 5520	16
	ExtremeSwitching 5720	100
	ExtremeSwitching 5320, 5420	12
OSPFv3 external routes— recommended maximum number of external routes.	ExtremeSwitching 5520, 5720-MXW	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	4,000
	ExtremeSwitching 5320, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching 5520, 5720	256
	ExtremeSwitching 5320, 5420	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching 5520, 5720	64
	ExtremeSwitching 5320, 5420	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching 5520, 5720	16
	ExtremeSwitching 5320, 5420	12
PIM IPv4 (maximum interfaces)— maximum number of PIM active interfaces.	ExtremeSwitching 5320, 5420, 5520, 5720	255

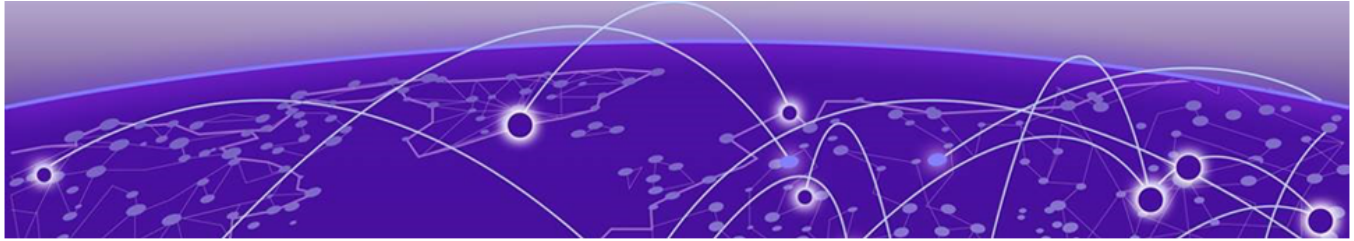Table 8: Supported Limits for the Premier License (continued)

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching 5320, 5420, 5520, 5720	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching 5320, 5420, 5520, 5720	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching 5320, 5420, 5520, 5720	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching 5320, 5420, 5520, 5720	255
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching 5320, 5420, 5520, 5720	1,750
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching 5320, 5420, 5520, 5720	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching 5320, 5420, 5520, 5720	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching 5320, 5420, 5520, 5720	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching 5320, 5420, 5520, 5720	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.

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[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

There are no open issues in this release.

Known Behaviors

The following is a limitation in Switch Engine architecture that has yet to be resolved.

Table 9: Known Issues, Platform-Specific, and Feature Change Requests (CRs)

Defect Number	Description
Universal Hardware	
EXOS-32459	Entering the **configure stacking easy-setup** command fails when building a stack from version 32.1 or earlier with nodes running on version 32.2. Workaround: Upgrade the clone on SwitchEngine version 32.1 to version 1.2.1.4 or later by using clone XMOD.

Resolved Issues in Switch Engine 32.2

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

Table 10: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 32.2

Defect Number	Description
General	
EXOS-31439	Turning autopolarity off might not take effect on a port running at 10Mbps or 100Mbps.
EXOS-31581	The Total Length field in IP packets was incorrectly set to 5120 for PIM null register messages.
EXOS-31700	Access VLAN traffic is not forwarded over MLAG port to networks VLAN.
EXOS-31742	HTTPS Chalet login failure with the message `soap error session failed` when attempting to log in via the same tab.
EXOS-31949	L3 Remote mirror not working properly.
EXOS-31998	OnePolicy rule precedence order can be changed using a command from 30.2 and later.
EXOS-32028	Increase the MDIO clock frequency on ExtremeSwitching 5520 switches from 2.5MHz to 5MHz.
EXOS-32056	The footer should be printed without consideration of CLI paging.
EXOS-32123	A new file sub-directory `oe-sdk-hardcoded-buildpath` is present in the /usr/local/ directory.
EXOS-32259	Switch sends overheat condition as an SNMPv1 trap despite MIB files denying it as SNMPv2.
EXOS-32279	HAL error log occurs when upgrading an ExtremeSwitching 5520 switch with 10504 Gbic.
EXOS-32288	LLDP MED application configuration is removed from the port if the port is removed from the VLAN.
EXOS-32349	Clone adds extra header to primary.cfg.
Extended Edge Switching	
EXOS-31638	ExtremeXOS should throw an error to disable SLPP before configuring VPEX when it was enabled.

Table 10: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 32.2 (continued)

Defect Number	Description
SummitStack	
EXOS-32096	With only one ExtremeSwitching 5720 switch present in a 5720+5520 mixed stack, upgrading the Switch Engine version using the bundle lst image (for example, `onie-summit_arm-32.1.1.6-bundle.lst`) fails with the following message: `Error: Can not find any EPM peer at all` The same error occurs when using the onie image if the 5720 slot number is not specified. Workaround: Download and install the onie image to the 5720 by specifying the 5720 slot number, followed by the summit_arm image for all remaining slots. For example: **download image 1.2.3.4 onie-32.1.1.6.x86_64.xos slot 1 install** **download image 1.2.3.4 summit_arm-32.1.1.6.xos install**