ExtremeXOS Release Notes

Software Version ExtremeXOS 31.3.1-Patch1-10

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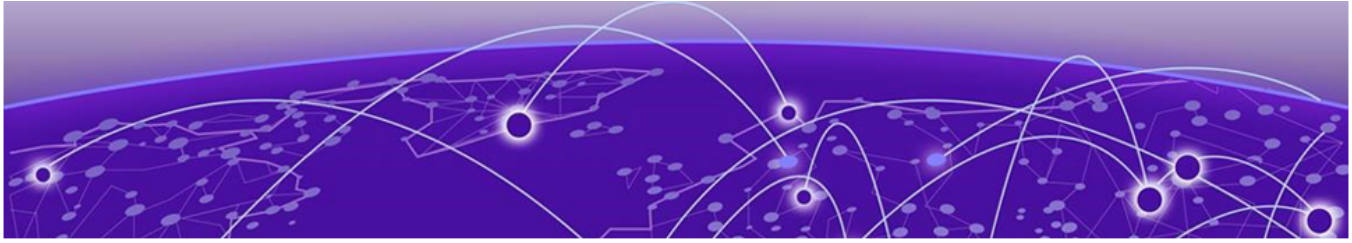

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Preface

Read the following topics to learn about:

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

Conventions

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

Text Conventions

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

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

Table 1: Notes and warnings

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

Table 2: Text

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

Table 3: Command syntax

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

Platform-Dependent Conventions

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

- ExtremeSwitching® switches
- SummitStack™

When a feature or feature implementation applies to specific platforms, the specific platform is noted in the heading for the section describing that implementation in the ExtremeXOS command documentation (see the Extreme Documentation page at www.extremenetworks.com/documentation/). In many cases, although the command is available on all platforms, each platform

uses specific keywords. These keywords specific to each platform are shown in the Syntax Description and discussed in the Usage Guidelines sections.

Terminology

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

Send Feedback

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

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

To send feedback, do either of the following:

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

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

Help and Support

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

Extreme Portal

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

The Hub

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

Call GTAC

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

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

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

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

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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.

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Related Publications

ExtremeXOS Publications

- *ACL Solutions Guide*
- *ExtremeXOS 31.3 Command Reference Guide*
- *ExtremeXOS 31.3 Feature License Requirements*
- *ExtremeXOS 31.3 User Guide*
- *ExtremeXOS Quick Guide*
- *ExtremeXOS Release Notes*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*
- *Extreme Optics Compatibility*
- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*
- *Using AVB with Extreme Switches*

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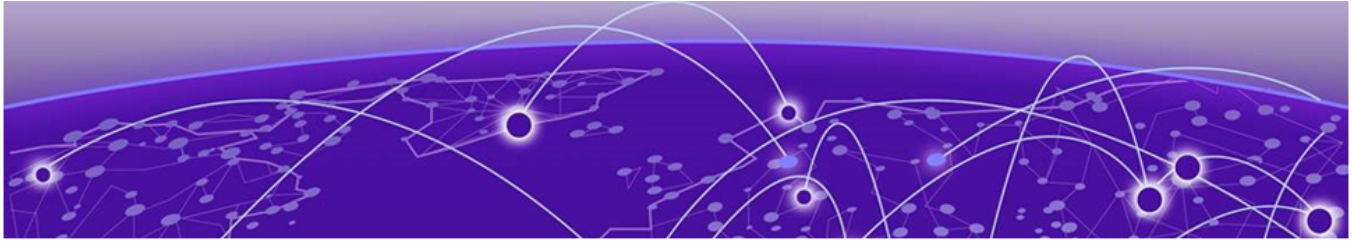


Overview

These release notes document ExtremeXOS 31.3, which adds features and resolves software deficiencies.

Security Information

The following section covers important security information for ExtremeXOS 31.3.

Linux Kernel

ExtremeXOS 31.3 uses Linux Kernel 4.14.

OpenSSL Version

ExtremeXOS 31.3 uses FIPS openssl-fips-2.0.16.

Upgrading ExtremeXOS

For instructions about upgrading ExtremeXOS software, see *Software Upgrade and Boot Options* in *ExtremeXOS 31.3 User Guide*.

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

Stacking: Upgrading from ExtremeXOS 30.2 and Earlier

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

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

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

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

Newly Purchased Switches Require Software Upgrade

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

For information about upgrading the ExtremeXOS software, see the *ExtremeXOS Upgrade Process* topic in the *Software Upgrade and Boot Options* chapter of the *ExtremeXOS 31.3 User Guide*.

Default ExtremeXOS® Settings

Table 4 shows the default settings for ExtremeXOS starting with version 30.1, and shows any changes that have been made to these settings and in what version these changes were made.

Table 4: Default ExtremeXOS Settings

Feature	30.1	30.2	30.3	30.5	30.6	31.1	31.2	31.3
Account Lockout	After 3 consecutive login failures, account is locked for 5 minutes.							
AVB	Disabled.							
BFD Strict Session Protection	N/A.		Disabled.					
BGP	Disabled.							
Bluetooth	N/A.		Enabled.					
BOOTP Relay	Disabled.							
CDP	Enabled.							
Configuration auto save	Disabled.							
Clear-flow	Disabled.							
Diagnostics	Admin level privileges required to show diagnostics.							
DHCP	Disabled.							
DNS Cache Resolver and Analytics	N/A.		Disabled.					
IPFIX	Disabled.							
IP NAT							Disabled.	
EAPS	Disabled.							
EDP	Enabled on management port.							
ELRP	Disabled.							
ESRP	Disabled.							

Table 4: Default ExtremeXOS Settings (continued)

Feature	30.1	30.2	30.3	30.5	30.6	31.1	31.2	31.3
Extended Edge Switching (VPEX)	Disabled.							
ExtremeCloud IQ	N/A.	N/A.	N/A.	N/A.		Enabled		
Identity Management	Disabled.							
IGMP	Enabled, set to IGMPv2 compatibility mode.							
IGMP Snooping	Enabled.							
Image Integrity Check						Disabled.		
IP Route Compression	Enabled.							
ISIS	Disabled.							
Log	Admin level privileges required to show log.							
Logging memory buffer	Generate an event when the logging memory buffer exceeds 90% of capacity.							
MAC Security	Disabled.							
MLD	Disabled.							
MLD Snooping	Disabled.							
MPLS	Disabled.							
MSRP	Disabled.							
MSTP	Enabled.							
NetLogin	All types of authentication are disabled.							

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

Table 4: Default ExtremeXOS Settings (continued)

Feature	30.1	30.2	30.3	30.5	30.6	31.1	31.2	31.3
NTP	Disabled.							
ONEPolicy	Disabled.							
Policy rule model				Access list (Unless upgrading to 30.5 with existing policy rules configuration, then the default is hierarchical.	Hierarchical (Unless upgrading from 30.5 with a saved configuration set to access list.)			
OpenFlow	Disabled.			Not supported.				
OSPF	Disabled.							
OVSDB	Disabled.							
Passwords	Plain text password entry not allowed.							
PIM	Disabled.							
PIM Snooping	Disabled.							
PoE Fast PoE Perpetual PoE	Enabled. N/A. N/A.		Enabled. Disabled. Disabled.					
RADIUS	Disabled for both switch management and network login.							
RIP	Disabled.							

Table 4: Default ExtremeXOS Settings (continued)

Feature	30.1	30.2	30.3	30.5	30.6	31.1	31.2	31.3
RMON	Disabled. However, even in the disabled state, the switch responds to RMON queries and sets for alarms and events.							
sFlow	Disabled.							
SNMP server	Disabled.							
SSH	Disabled.							
Stacking	—	Disabled, except for X450-G2, X465.	—	—				
Stacking auto-discovery	N/A.		Enabled.					
STP	Enabled.							
Syslog	Disabled.							
TACACS	Disabled.							
Telnet	Disabled.							
VPEX IP Multicast Replication	Controlling Bridge	Controlling Bridge	Controlling Bridge	BPE	Controlling Bridge	BPE	31.2.1: BPE 31.2.1-Patch1-5: Controlling Bridge	Controlling Bridge
VPLS	All newly created VPLS instances are enabled.							
Watchdog	Enabled.							
Web HTTP server	Disabled.							

ExtremeXOS 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: ExtremeXOS Image Types (Prefixes)

Switches	Image File Type (Prefix)
ExtremeSwitching X465, X690, X695, X590, and X870	`onie-` Example: `onie-22.2.1.2.xos` Note: These image files use the Open Network Install Environment (ONIE).
ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X620,	`summitX-` Example: `summitX-22.2.1.2.xos`
ExtremeSwitching X435	`summitlite_arm-` Example: `summitlite_arm-30.5.0.102.xos`
ExtremeSwitching 5520, 5420	`summit_arm` Example: `summit_arm-31.1.0.3.xos`

New and Corrected Features in ExtremeXOS 31.3

This section lists the new and corrected features supported in the 31.3 software:

Generic Routing Encapsulation (GRE) Tunnels on User Virtual Routers (VRs)

Previously, GRE tunnels in ExtremeXOS could only be configured on the Default virtual router (VR). This feature expands the configuration of GRE tunnels to be on user VRs. You can also configure the L3/IP interface of GRE tunnels on different VRs than the VR for the endpoints (source and destination IP addresses).

Supported Platforms

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

Changed CLI Commands

Changes are underlined.

`create tunnel` *`tunnel_name`* **`gre destination`** *`destination-address`* **`source`** *`source-address`* {**`vr`** *`vr_name`*} {**`payload-vr`** *`payload_vr_name`*}

`show` [{**`tunnel`**} {*`tunnel_name`*} | **`tunnel`**{**`vr`** [*`vrname`* | **`all`**]} {**`payload-vr`** *`payload_vrname`*} {**`detail`**}]

Keychain Manager

Keychain Manager (KCM) creates and manages authentication keys in ExtremeXOS. In KCM, all keys are grouped into sets called **keychains**. KCM stores keychains and manages the activation, expiration, and rollover of keys.

When an ExtremeXOS application registers to use a keychain, KCM informs the application of key-related events and provides information about keys the application needs for authentication.

Keys and Keychains

A keychain contains up to 8 keys. Each key has a *key identifier*, or key ID, that is unique within the keychain, and a secret *key string* that is used for authentication of protocol packets.

Each key has a cryptographic algorithm, which is used with the key string to calculate the key's hash value. You select an algorithm for each key: either HMAC-SHA-1, HMACSHA-256 (the default), HMAC-SHA-384, or HMAC-SHA-512. All of the algorithms are NIST FIPS 180-4 compliant. Keys in the same keychain can have different algorithms.

Key Lifetimes

An *active key* is the key currently being used by the applications registered to a keychain. Within a keychain, only one key can be active at a time. When an active key expires, KCM attempts to roll over to a new active key. KCS selects the new active key based on *key lifetimes* you have defined.

How KCM Manages Keys and Keychains

When an application is registered to use a keychain, and the active key expires, KCM selects a new active key from within the keychain.

When an active key expires and when a new key becomes active, KCM notifies the registered applications for that keychain. The notification includes the key string for the new active key.

We recommend that you configure keys in each keychain so that keys roll over at predetermined times. However, you can configure a grace period of up to 600 seconds so that a recently expired key can be accepted for incoming packets by applications that support the feature.

You can delete a key unless it is the active key for a keychain. However, you cannot change a key's key string.

Supported Platforms

This command is available on ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5420, and 5520 series switches.

Note
Keychain Manager is only supported on the OSPFv3 application and user VR.

New CLI Commands

`create keychain` *`keychain_name`*

`configure keychain` *`keychain_name`* **`accept-tolerance`** *`seconds`*

```
configure keychain keychain_name add key key_id key-string [text_string
active-lifetime local start start_time [end end_time | [duration
[seconds | maximum]]] | encrypted encrypted_string]

configure keychain keychain_name key key_id active-lifetime local start
start_time [end end_time | [duration [seconds | maximum]]]

configure keychain keychain_name key key_id hash-algorithm algorithm

delete keychain keychain_name

show keychain keychain_name detail
```

Optic Port Compatibility Check

For QSFP/QSFP28 (non-stacking) ports on all supported platforms, the **show port information** and **show port information detail** commands identify whether a port is properly configured for the required partition or speed, or if there is not appropriate licensing support. For example, these commands will indicate:

- if a QSFP28 to 4xSFP28 breakout cable has the QSFP28 end inserted into a port that is misconfigured for 1x100G partition mode; or
- if a 1x100G QSFP28 optic is inserted into a port that is not licensed to run at the indicated higher speed

The "?" symbol is used to indicate an optic with a mismatched partition. If an optic is a third party unsupported optic, then the "!" unsupported indication will override the "?" mismatched partition indication.

If the switch does not have the proper license to operate at the optic's given speed, then the port cannot be partitioned for any corresponding port speeds. For example, if a 100G optic is inserted into an unlicensed port regardless of the operating mode, the CLI will display "?$" to indicate a mismatched partition and unlicensed port. In addition to these CLI display indications, a corresponding informational message will be logged to help determine the cause of the indications.

Supported Platforms

This command is available on any ExtremeSwitching switch with QSFP/QSFP28 ports that can be configured as a non-stacking standard port: X465, X590, X690, X695, X770, X870, 5420, and 5520 series switches.

Supported Platforms for Licensing

This command is supported on ExtremeSwitching X440-G2 and X870 for licensing.

Changed Commands

```
show port {mgmt |port_list | tag tag} information {detail}

show ports {mgmt | port_list | tag tag} configuration {no-refresh |
refresh}
```

Fabric Attach - Zero Touch Client

Zero Touch Client (ZTC) adds addition functionality that enhances Fabric Attach (FA) by allowing static mappings for client types. Normally, Network Service Identifier (NSI) or Virtual LAN (VLAN) mappings are received from the Client through Link Layer Discovery Protocol (LLDP), or are configured statically on a port. Zero Touch Client provides a method to configure a mapping for a specific client type, so that all devices of that type that are discovered will have the same mapping. For example, all LLDP neighbors defined as Fabric Attach Client Phones can be configured to be added to VLAN "phoneVlan." In this scenario, all phones are treated the same without the Client requiring knowledge of this. Zero Touch Client NSI or VLAN mappings are added to the VLAN as the untagged VLAN for the port.

Zero Touch Client can configure only one mapping per client type since there can be only one untagged port VLAN. Zero Touch Client provides a method to configure port priority. If no priority is provided, the statically configured dot1p priority will be used.

Base Zero Touch (ZT) auto-attach functionality allows a device to acquire management VLAN information and use this data to facilitate device manageability and network configuration download across the network. When you have enabled Base ZT auto-attach operation, it extracts management VLAN data from the primary FA Server advertisements, and potentially uses this data to update the in-use management VLAN. This information can also be cascaded to FA Clients. An FA proxy can disable management VLAN cascading to clients device-wide, and disable by port.

Zero Touch Server Management VLAN

Zero Touch Server enhances FA by allowing a management VLAN to be automatically propagated to FA proxy and FA clients. FA proxy and FA clients use the VLAN to obtain an IP address via Dynamic Host Configuration Protocol (DHCP) and connect to a management device.

Supported Platforms

This command is available on ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5420, and 5520 series switches.

New CLI Commands

```
configure fabric attach management-vlan ports [port_list | all] forward
[on | off]

configure fabric attach ports [port_list | all] enable | disable]

configure fabric attach zero-touch-client client [vlan [vlan_name |
vlan_id] [nsinsi | isid isid] {priority [priority | dot1p]} {enable |
disable} | none] | enable | disable]

show fabric attach ports [port_list | all]

show fabric attach zero-touch-client
```

Enable and Disable Reply to Multicast or Anycast Echo Requests

Users can enable or disable a reply to multicast or anycast echo requests.

Supported Platforms

This command is available on ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5420, and 5520 series switches.

New CLI Commands

```
enable icmp ipv6 [ignore-multicasts | ignore-anycasts]

disable icmp ipv6 [ignore-multicasts | ignore-anycasts]
```

ExtremeCloud™ IQ Agent Proxy Support

Users can configure the ExtremeCloud™ IQ Agent HTTP Proxy server IP and port, and define the username and password, if required.

Supported Platforms

ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, 5420, and 5520 series switches.

New CLI Command

```
configure iqagent http-proxy [ipaddress [fqdn | ip_address] port
port_number | user user_name password [encrypted encrypted_password |
password] | none]
```

OSPFv3 Authentication Trailer

There are two ways to perform authentication for OSPFv3: using IPsec and using Authentication Trailer. Authentication Trailer provides an alternative way to authenticate packets, as IPsec may not be suitable in some environments.

Authentication Trailer uses Keychain Manager to manage keys. Keychain Manager provides OSPFv3 the key string and algorithm to use for authentication when a key becomes active, and it will notify OSPFv3 when a key expires. The authentication configuration is per interface or virtual interface, and the corresponding peers need to be configured with the same authentication keys. The maximum length of a key string that OSPFv3 can accommodate is 127 characters, which is the same as the maximum length of a key string currently allowed by Keychain Manager.

The cryptographic algorithms supported are HMAC-SHA-1, HMAC-SHA-256, HMAC-SHA-384, and HMAC-SHA-512.

Note
OSPFv3 Authentication Trailer does not support the accept tolerance feature of Keychain Manager.

Supported Platforms

This command is available on ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5420, and 5520 series switches.

Note
Keychain Manager is only supported on the OSPFv3 application and user VR.

New CLI Commands

`configure ospfv3 [{vlan} vlan-name | {tunnel} tunnel-name] authentication [keychain keychain-name | none]`

`configure ospfv3 virtual-link {routerid} router-identifier {area} area-identifier authentication [keychain keychain_name | none]`

Layer 2 Protocol Tunneling Support for VxLAN Tenant VLANs

Layer 2 protocol tunneling (L2PT) is achieved by encapsulating the PDUs at the ingress PE device before transmitting them over the service provider network. The encapsulation prevents the PDUs from being processed by the switches in the SP network. At the egress PE device, the encapsulated packets are de-encapsulated, and transmitted to the CE device.

An added encapsulation is used for different types of networks:

- VXLAN – The DA MAC of the Layer 2 PDU is changed to L2PT DA MAC at the ingress remote tunnel end-point (RTEP). The modified packet is then encapsulated into a VXLAN packet and sent over the network. At the egress RTEP, the packet is lifted to the CPU for L2PT processing. After VXLAN decapsulation, the DA MAC is changed from L2PT MAC to the protocol MAC and is sent on the access ports of the tenant VLAN.

An operator can specify a value of CoS for the tunneled PDUs. This can be useful since some L2 protocols may have a higher priority than others (for example, may be considered higher priority than). If a CoS value is specified for a protocol for which tunneling is enabled, the switch will transmit the encapsulated PDUs for that protocol with the operator specified CoS towards the network. An added CoS value specified by the operator is transmitted on the SP network:

- VXLAN – The CoS value configured on the profile attached to the access port is written to the PRI bits of the outer VLAN header of the VXLAN encapsulated frames before transmitting them to other RTEPs.

As VXLAN tunneled packets cross L3 boundaries in the underlay network, the CoS can get lost when traversing L3 boundaries. An operator may choose to configure a Differentiated Services Code Point (DSCP) that needs to be set in the outer IP header of the encapsulated packets. If the packet encapsulated into the VXLAN tunnel is an IP packet, the DSCP from inner IP header is typically copied to DSCP of the outer IP header. A configuration option is provided to overwrite this outer DSCP value. In case of L2 protocols (which do not have an inner DSCP), the configured DSCP value is set in the outer IP header.

Supported Platforms

This command is supported on the ExtremeSwitching X770, X670-G2, X465, X590, X690, X695, X870, 5520 series switches, and stacks with X465, X590, X670-G2, X690, X770, X695, X870, 5520 slots only.

New CLI Commands

`clear l2pt counters {[vlan] vlan_name {{vxlan {vr vr_name} rtep rtep_ipv4}}}`

`configure [[{vlan vlan_name] [vxlan {vr vr_name} rtep rtep_ipv4]] l2pt profile [none | profile_name]`

```
show [[{vlan} vlan_name] {{vxlan {vr vr_name} rtep rtep_ipv4}}] l2pt
{detail}
```

Change of Authorization (Dynamic Authorization)

NAS Indentification attributes provided by the extension packets are used to determine the DA Controller that is to disconnect the session:

- NAS-IP-Address—This IPV4 address must match the primary IP address of the default interface for a match to occur.

If all of these attributes do not match, the request is responded to with a Disconnect-NAK response.

Starting with ExtremeXOS 31.3, the **nas-ip** option can be configured to *ignore* this requirement.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, 5420, and 5520 series switches.

Limitations

The following features of Change-of-Authorization (RFC5176) are not implemented in ExtremeXOS:

- Reverse Path Forwarding Check—Typically this is used in a proxy scenario. This check is used to determine if the IP address indicated by the attributes is a routable destination address for a request sent by the switch software.
- IPSEC encryption—End-to-end encryption of both the RADIUS requests and responses.
- Disconnect-Request and Change-of-Authorization packets identifying sessions with anything other than the Calling-Station-Id attribute containing a properly formatted MAC address. In addition to the Calling-Station-ID attribute, you can also use a NAS-Port attribute, which indicates the index of the specific port the session is connected to.
- Acct-Session-Id attribute—This is an alternate means of session identification. Sessions are currently uniquely identified by port and MAC address pair.
- Retransmissions of Disconnect-Request or Change-of-Authorization ACK and NAK packets—Retransmissions of packets is the responsibility of the device initiating the dynamic authorization transactions.

Changed CLI Command

Changes are underlined.

```
configure radius dynamic-authorization index [nas-ip [ignore | require]
| server [host_ipaddr | host_ipV6addr | hostname] client-ip
[client_ipaddr | client_ipV6addr] {vr vr_name} {shared-secret
{encrypted} secret}
```

New Hardware Supported in ExtremeXOS 31.3

The following new hardware is supported in ExtremeXOS 31.3.

Table 6: ExtremeSwitching 5420 Series Switches

ExtremeSwitching 5420F-8W-16P-4XE	8 10/100/1000BASE-T full/half duplex MACsec capable ports* with 802.3bt Type 4 PoE (90W), 16 10/100/ 1000BASE-T full/half duplex ports with Type 2 PoE+ (30W) ports, and 4 1/10G SFP+ ports, includes 2 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-24P-4XE	24 10/100/1000BASE-T full/half duplex MACsec capable ports* with 802.3bt Type 2 PoE+ (30W) and 4 1/10G SFP+ ports, includes 2 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-24S-4XE	24 1000BASE-X SFP MACsec capable ports and 4 1/10G SFP+ ports, includes 2 fixed fans, 1 fixed PSU, 1 unpopulated PSU slots, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-24T-4XE	24 10/100/1000BASE-T full/half duplex MACsec capable ports* with 802.3bt Type 2 PoE+ (30W) and 4 1/10G SFP+ ports (PoE on RJ-45 ports is not supported), includes 2 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-16MW-32P-4XE	16 100Mb/1Gb/2.5Gb ports with 802.3bt Type 4 PoE (90W), 32 10/100/1000BASE-T full/half duplex MACsec capable ports* with Type 2 PoE+ (30W), and 4 1/10G SFP+ ports, includes 3 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-16W-32P-4XE	16 10/100/1000BASE-T full/half duplex MACsec capable ports* with 802.3bt Type 4 PoE (90W), 32 10/100/ 1000BASE-T full/half duplex MACsec capable ports with Type 2 PoE+ (30W), and 4 1/10G SFP+ ports, includes 3 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot , rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-48P-4XE	48 10/100/1000BASE-T full/half duplex MACsec capable ports* with Type 2 PoE+ (30W) and 4 1/10G SFP+ ports, includes 3 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-48P-4XL	48 10/100/1000BASE-T full/half duplex MACsec capable ports* with Type 2 PoE+ (30W) and 4 1/10G SFP+ LRM and MACsec capable ports, includes 3 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420F-48T-4XE	48 10/100/1000BASE-T full/half duplex MACsec capable ports* with Type 2 PoE+ (30W) and 4 1/10G SFP+ ports, includes 2 fixed fans, 1 fixed PSU, 1 unpopulated PSU slot, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420M-24T-4YE	24 10/100/1000BASE-T full/half duplex MACsec capable ports* and 4 1/10/25G SFP28 ports, includes 1 removable fan module, 2 unpopulated PSU slots, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420M-24W-4YE	24 10/100/1000BASE-T full/half duplex MACsec capable ports* with 802.3bt Type 4 PoE (90W) and 4 1/10/25G SFP28 ports, includes 1 removable fan module, 2 unpopulated PSU slots, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420M-16MW-32P-4YE	16 100Mb/1Gb/2.5Gb ports with 802.3bt Type 4 PoE (90W), 32 10/100/1000BASE-T full/half duplex MACsec capable ports* with Type 2 PoE+ (30W), and 4 1/10/25G SFP28 ports, includes 1 removable fan module, 2 unpopulated PSU slots, rack mount kit, ExtremeXOS Base license.

Table 6: ExtremeSwitching 5420 Series Switches (continued)

ExtremeSwitching 5420M-48T-4YE	48 10/100/1000BASE-T full/half duplex MACsec capable ports* and 4 1/10/25G SFP28 ports, includes 1 removable fan module, 2 unpopulated PSU slots, rack mount kit, ExtremeXOS Base license.
ExtremeSwitching 5420M-48W-4YE	48 10/100/1000BASE-T full/half duplex MACsec capable ports* with 802.3bt Type 4 PoE (90W) and 4 1/10/25G SFP28 ports, includes 1 removable fan module, 2 unpopulated PSU slots, rack mount kit, ExtremeXOS Base license.

Note
* - MACsec is not supported in ExtremeXOS 31.3.

Dual Network Operating System Information

The ExtremeSwitching 5420 series switches can run two different network operating systems: ExtremeXOS (default) or VOSS. When you power up the switch for the first time, you must select an operating system.

For more information about selecting a network operating system, or changing it after initial selection, see Changing the Network Operating System on page 23.

Upgrading the BootROM

For ExtremeSwitching 5420 series switches, the BootROM image is packaged in the ExtremeXOS `.xos` image file.

When running the command `install bootrom {from-exos} [fname | local-file] {reboot} {slot slotid}`, the **from-exos** option specifies using the BootROM version packaged with the ExtremeXOS image. You do not need to specify a file name.

Changing the Network Operating System

ExtremeSwitching Universal Hardware switches can run two different operating systems: ExtremeXOS (default) or VOSS.

Making Your Initial Network Operating System Selection

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

- ExtremeCloud™ IQ (see #unique_32)—You can select your network operating system when purchasing your switch, which associates the switch serial number with your desired network operating system, which then causes the desired network operating system to be loaded during ExtremeCloud onboarding. For more information about using ExtremeCloud IQ, go to https://www.extremenetworks.com/support/documentation/extremecloud-iq/.
- Extreme Management Center— see *Extreme Management Center User Guide*
- Manually during boot-up:
  - Bootloader—When the message `Starting Default Bootloader ...Press and hold the <spacebar> to enter the bootrom` appears, press and hold the **space bar** until the boot menu appears (you have 30 seconds):

```
*** 5420- Boot Menu ( 2.2.1.3 ) ***

     EXOS: Default
     EXOS: Primary 31.3..
     EXOS: Secondary 31.3..
     EXOS: Primary 31.3.. with default configuration
     EXOS: Secondary 31.3.. with default configuration
     EXOS: Rescue
     Change the switch OS to VOSS
     Run Manufacturing Diagnostics
     Update bootloader
     Reboot system
```

Use the **up** and **down** arrow keys to select `Change the switch OS to VOSS`, and then press **Enter**.

- Safe defaults mode start-up menu—When the question `Would you like to change the switch OS to VOSS? [y/N/q]` appears:
  - For ExtremeXOS, type `N`.
  - For VOSS, type `y`.

Continue to log onto the switch. For more information about logging onto the switch, see the *ExtremeXOS 31.3 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 VOSS, and you want to statically assign IP addresses on the DHCP server, then it is recommended to assign them based on the DHCP client ID. For more information about this issue, see the *Using a BOOTP or DHCP Server* topic in the *ExtremeXOS 31.3 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 VOSS.

ExtremeSwitching 5420 Series Switches License Information

The ExtremeSwitching 5420 series switches are part of a new category of switches called universal hardware switches. The universal hardware switches introduce a new licensing scheme.

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

Premier = Core

Base = Advanced Edge + AVB

The ExtremeSwitching 5420 series switches provide the Base License as standard. Optionally, you can purchase a Premier license, which adds additional functionality.

You can add MAC Security capability to either the Base or Premier License by purchasing a MAC Security Feature Pack License.

ExtremeSwitching 5420 series switches include a one-year subscription to an ExtremeCloud™ IQ Pilot license.

Note
The entitlement period starts the day the switch ships from Extreme Networks or an Extreme Networks distribution partner.

ExtremeCloud IQ enables end-to-end network management and operations, delivering a fully integrated, extensible platform that simplifies the design, deployment, and security of networks from the edge to the data center, while simultaneously unlocking valuable IT and business insights. To activate these premium Pilot level capabilities, go to https://www.extremenetworks.com/universal-switch-xiq-pilot.

Different commands are introduced in ExtremeXOS 31.3 to install and remove licenses from the ExtremeSwitching 5420 series switches (see the following section). Additionally, at a future date, ExtremeCloud IQ will have the ability to obtain and activate licenses (see https://www.extremenetworks.com/support/documentation/extremecloud-iq/).

For more information about licenses, see the *ExtremeXOS 31.3 Feature License Requirements*.

New CLI Commands

```
install license file filename {slot slot}

uninstall license file filename {revoke directory} {slot slot}

uninstall license product product_name [revoke revocation_file |
withhold] {slot slot}
```

Changed CLI Commands

Changes are underlined.

```
show licenses {[slot slot |all]} {detail}

configure stacking {node-address node-address | slot slot-number}
license-level license_restriction[core | advanced-edge | edge]
```

The following command has keywords removed.

`configure stacking {`**`node-address`** *`node-address`* `|` **`slot`** *`slot-number`*`}` **`license-level`** *`license_restriction`*

The following commands now show licensing information specific to ExtremeSwitching 5420 series switches:

`show stacking configuration`

`show stacking {`**`node-address`** *`node_address`* `|` **`slot`** *`slot_number`*`}` **`detail`**

ExtremeSwitching 5420 Series Switches Trial License

The ExtremeSwitching 5420 series switches have a renewable trial license.

New ExtremeSwitching 5420 switches include a Factory Default (Evaluation) License to use all features (excluding MACsec). This Evaluation license is equivalent to a Premier license. You can configure all features, except MACsec, without restrictions and save the configuration. The evaluation periods is restricted to 30 days. If after 30 days you have not obtained and installed a Premier license, when you reboot the switch, the switch will effectively have only Base license capabilities.

You can extend the evaluation period by three more 30-day periods using a CLI command (see the following section):

Changed CLI Commands

The following commands now work on the ExtremeSwitching 5420 series switches.

`debug` **`epm enable trial-license`**

`debug` **`epm clear trial-license`**

ExtremeCloud™ IQ Agent Support

ExtremeXOS 31.3 supports ExtremeCloud IQ. 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 7: Supported Platforms

Switch Series	Switch Models
ExtremeSwitching X435	X435-8T-4S X435-8P-4S X435-8P-2T-W X435-24T-4S X435-24P-4S
ExtremeSwitching X440-G2	X440-G2-24P-10GE4 X440-G2-48P-10GE4 X440-G2-12T-10GE4 X440-G2-12P-10GE4 X440-G2-24T-10GE4 X440-G2-48T-10GE4
ExtremeSwitching X450-G2	X450-G2-24P-10GE X450-G2-48P-10GE X450-G2-24P-GE4 X450-G2-48P-GE4
ExtremeSwitching X460-G2	X460-G2-24P-10GE4 X460-G2-48P-10GE4 X460-G2-16MP-32P-10GE4 X460-G2-24P-48HP-10GE4
ExtremeSwitching X465	X465-48P X465-24MU-24W X465-24W X465-48W X465-24MU
ExtremeSwitching 5420	5420F-8W-16P-4XE 5420F-24P-4XE 5420F-24S-4XE 5420F-24T-4XE 5420F-16MW-32P-4XE 5420F-16W-32P-4XE 5420F-48P-4XE 5420F-48P-4XL 5420F-48T-4XE 5420M-24T-4YE 5420M-24W-4YE 5420M-16MW-32P-4YE 5420M-48T-4YE 5420M-48W-4YE
ExtremeSwitching 5520	5520-24T 5520-24W 5520-48T 5520-48W 5520-12MW-36W 5520-24X 5520-48SE

Extreme Hardware/Software Compatibility and Recommendation Matrices

The *Summit, ExtremeSwitching, and E4G Components: ExtremeXOS Software Support* provide information about the minimum version of ExtremeXOS software required to support switches.

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

To find the recommended EXOS releases for EXOS-based hardware platforms, see *ExtremeXOS Release Recommendations*.

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

Compatibility with Extreme Management Center or ExtremeCloud IQ - Site Engine (Formerly NetSight)

ExtremeXOS 31.3 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

Supported MIBs

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

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

For detailed information on which MIBs and SNMP traps are supported, see the *Extreme Networks Proprietary MIBs* and *MIB Support Details* sections in the *ExtremeXOS 31.3 User Guide*.

Tested Third-Party Products

The following third-party products have been tested for ExtremeXOS 31.3.

Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS

Tested Third-Party Clients

The following third-party clients are fully tested:

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

Extreme Switch Security Assessment

DoS Attack Assessment

Tools used to assess DoS attack vulnerability:

- Network Mapper (NMAP)

ICMP Attack Assessment

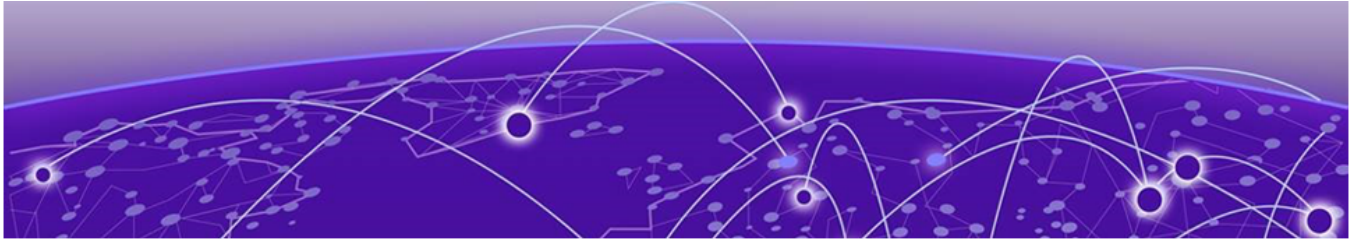
Tools used to assess ICMP attack vulnerability:

- SSPing
- Twinge
- Nuke
- WinFreeze

Port Scan Assessment

Tools used to assess port scan assessment:

- Nessus



Limits

This chapter summarizes the supported limits in ExtremeXOS 31.3.

Limits Overview

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

- #unique_42
- #unique_43
- #unique_44
- #unique_45

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

Switch Category	Switches	Applicable License Levels
Non-universal switches	X435 *, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870	Value Edge *, Edge, Advanced Edge, Core
Universal hardware switches	5420, 5520	Base, Premier
Note: * The X435 is the only switch that supports the Value Edge license level.		

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

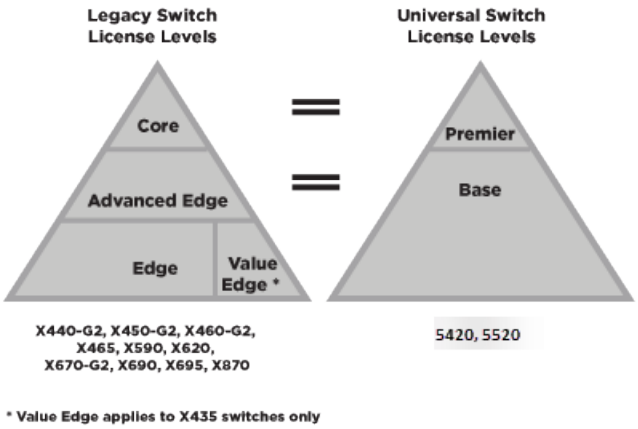


Figure 1: License Levels for Legacy and Universal Switches

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

Premier = Core

Base = Advanced Edge + AVB

For more information about licenses, see *ExtremeXOS 31.3 Feature License Requirements*.

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

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

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

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

Value Edge License Limits

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

Table 8: Supported Limits for Value Edge License

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

Table 8: Supported Limits for Value Edge License (continued)

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

Table 8: Supported Limits for Value Edge License (continued)

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

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	ExtremeSwitching X435	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching X435	500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	ExtremeSwitching X435	2,500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching X435	12,500
IGMPv3 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X435	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching X435	1,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching X435	10,000
IP ARP entries in software—maximum number of IP ARP entries in software. Note: Might be limited by hardware capacity of FDB (maximum L2 entries).	ExtremeSwitching X435	20,424
IPv4 ARP entries in hardware with minimum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. Assumes number of IP route reserved entries is 100 or less.	ExtremeSwitching X435	509 [h]
IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is “maximum.”	ExtremeSwitching X435	500 [h]

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
IPv4 remote hosts in hardware with zero LPM routes—maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less.	ExtremeSwitching X435	3,100 [h]
IPv4 routes—maximum number of static IPv4 routes in software (combination of unicast and multicast routes).	ExtremeSwitching X435	32
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching X435	32
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	ExtremeSwitching X435	15
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	ExtremeSwitching X435	15
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching X435	500
IPv6 routes in software—maximum number of static IPv6 routes in software.	ExtremeSwitching X435	16
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching X435	16
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X435	30
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching X435	32
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching X435	30
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching X435	9,216

Table 8: Supported Limits for Value Edge License (continued)

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

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Load sharing—maximum number of load sharing groups. Note: The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.	ExtremeSwitching X435	8
Load sharing—maximum number of ports per load-sharing group.	ExtremeSwitching X435 (standalone only)	8
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching X435	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching X435	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching X435	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters.	ExtremeSwitching X435	512
Maximum mirroring instances.	ExtremeSwitching X435	1 (egress)
Mirroring (filters)—maximum number of mirroring filters. Note: This is the number of filters across all the active mirroring instances.	ExtremeSwitching X435	128
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. Note: This is the number of filters across all the active mirroring instances.	ExtremeSwitching X435	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching X435	1

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching X435	63
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	ExtremeSwitching X435	2,500
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching X435	12,500
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	ExtremeSwitching X435	2,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching X435	10,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X435	200
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching X435	1,024
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching X435	1,024
Network Login VLAN VSAs—maximum number of VLANs a client can be authenticated on at any given time.	ExtremeSwitching X435	10
Network Service Identifiers (NSI)/ VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching X435	94
ONEPolicy Roles/Profiles—maximum number of policy roles/ profiles.	ExtremeSwitching X435	63
ONEPolicy Rules per Role/Profile—maximum number of rules per role/policy.	ExtremeSwitching X435	IPv4 Rules: 128 L2 Rules: 56

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch with TCI-Overwrite disabled. Note: The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X435	192
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port per switch with TCI overwrite disabled. Note: The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X435	187
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	ExtremeSwitching X435	184
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	ExtremeSwitching X435	128
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	ExtremeSwitching X435	56
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching X435	256 [o]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching X435	32 [o]
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching X435	15

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. Note: This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	ExtremeSwitching X435	15
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching X435	15
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching X435	10,000
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching X435	16
Spanning Tree PVST+—maximum number of port mode PVST domains. Note: For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, ExtremeSwitching X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching X435	128
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching X435	16
Spanning Tree—maximum number of VLANs per MSTI. Note: Maximum number of 10 active ports per VLAN when all 100 VLANs are in one MSTI.	ExtremeSwitching X435	100
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching X435	256

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
Spanning Tree (802.1d domains)—maximum number of 802.1d domains per port.	ExtremeSwitching X435	1
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	ExtremeSwitching X435	1,024
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching X435	256
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	ExtremeSwitching X435	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching X435	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching X435	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching X435	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	ExtremeSwitching X435	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching X435	16 (local-only VRs)
Virtual router forwarding (VRFs)—maximum number of VRFs that can be created on a switch. Note: * Subject to other system limitations.	ExtremeSwitching X435	16 (local-only VRFs)
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	ExtremeSwitching X435	1,000
VLANs—includes all VLANs.	ExtremeSwitching X435	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching X435	4,094

Table 8: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X435	IPv4: 30 IPv6: 15
VLANs (maximum active port-based)—maximum active ports per VLAN when 1,000 VLANs are configured with default license.	ExtremeSwitching X435	28
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X435	4,090
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	ExtremeSwitching X435	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching X435	15
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN. Note: This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports.	ExtremeSwitching X435	15
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching X435	15
VMAN CEP—maximum number of CVIDs.	ExtremeSwitching X435	192
XML requests—maximum number of XML requests per second. Note: Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	ExtremeSwitching X435	10 with 100 DACLs

Edge License Limits

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

Table 9: Supported Limits for Edge License

Metric	Product	Limit
AAA (local)—maximum number of admin and local user accounts.	All platforms, except X435	16
Access lists (meters)—maximum number of meters.	ExtremeSwitching X620, X440-G2	1,024 ingress 256 egress
	ExtremeSwitching X770, X670-G2, X450-G2, X460-G2	1,024 ingress 512 egress
	ExtremeSwitching X870, X690, X590, X465	2,048 ingress 512 egress
	ExtremeSwitching X695	6,000 ingress 2,000 egress
	ExtremeSwitching 5420	3,000 ingress 1024 egress
	ExtremeSwitching 5520	6,144 ingress 512 egress
Access lists (policies)—suggested maximum number of lines in a single policy file.	All platforms, except X435	300,000
	ExtremeSwitching 5420, 5520	N/A

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Access lists (policies)—maximum number of rules in a single policy file.[a]	ExtremeSwitching X460-G2, X450-G2, X770, X670-G2	4,096 ingress 1,024 egress
	ExtremeSwitching X620, X440-G2	2,048 ingress 512 egress
	ExtremeSwitching X870	3,072 ingress 1,024 egress
	ExtremeSwitching X690, X590, X465, X695	8,192 ingress 1,024 egress
	ExtremeSwitching 5420M	18,000 (rules double-wide (160-bit)) ingress 36,000 (rules single-wide (80-bit, default)) ingress 1,024 egress
	ExtremeSwitching 5420F	8,000 (rules double-wide (160-bit)) ingress 16,000 (rules single-wide (80-bit, default)) ingress 1,024 egress
	ExtremeSwitching 5520	9,216 ingress 1,024 egress
Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2ExtremeSwitching, X590, X465, 5520	2,048 ingress only
	ExtremeSwitching X670-G2, X770, X870, X690, X695, 5420	1,024 ingress only
	ExtremeSwitching X620, X440-G2	512 ingress only

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Access lists (slices)—number of ACL slices.	ExtremeSwitching X460-G2, X450-G2	16 ingress 4 egress
	ExtremeSwitching X770, X670-G2, X690, X590, X465, X695	12 ingress 4 egress
	ExtremeSwitching X440-G2, X620	8 ingress 4 egress
	ExtremeSwitching X870	4 ingress 4 egress
	ExtremeSwitching 5420, 5520	18 ingress 4 egress
Access lists (slices)—number of ACL slices in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X465, X620, X440-G2, X870, X690, X590, X695 , 5420, 5520	4 ingress only
ACL Per Port Meters—number of meters supported per port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770,X620, X440-G2, X870, X690, X590, X465, X695	16
	ExtremeSwitching 5420, 5520	2,048
ACL port ranges.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	32
Meters Packets-Per-Second Capable.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695	Yes
	ExtremeSwitching 5420, 5520	N/A
AVB (audio video bridging)—maximum number of active streams.	ExtremeSwitching X450-G2, X460-G2, X770, X620, X440-G2, 5420	1,024
	ExtremeSwitching X465, X670-G2, X695, X870, 5520, X690, X590	4,096
BFD sessions (Software Mode)—maximum number of BFD sessions.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X770, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520 (default timers—1 sec)	512
	ExtremeSwitching X460-G2, X670-G2, X450-G2, X770, X440-G2, X620, X870, X690, X590, X465, X695 (minimal timers—100 msec)	10 [C]
BFD IPv4 sessions (Hardware Assisted)—maximum number of IPv4 BFD sessions.	ExtremeSwitching X460-G2, X870, X690, X590, X465, X695	900 (PTP not enabled) 425 (PTP enabled) 256 (with 3 ms transmit interval)
BFD IPv6 sessions (Hardware Assisted)—maximum number of IPv6 BFD sessions.	ExtremeSwitching X460-G2, X870, X690, X590, X465, X695	425 (PTP not enabled)

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2 , X465, X620, X870, X690, X590, X695, 5420, 5520	8
BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X465, X620, X870, X690, X590, X695, 5420, 5520	8
BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2 , X465, X620, X870, X690, X590, X695, 5420, 5520	4,000
Connectivity fault management (CFM)—maximum number or CFM domains. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	8
CFM—maximum number of CFM associations. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	256
CFM—maximum number of CFM up end points. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	32
CFM—maximum number of CFM down end points. Note: With Advanced Edge license or higher.	ExtremeSwitching X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520 ExtremeSwitching X460-G2	32 256 (non-load shared ports) 32 (load shared ports)
CFM—maximum number of CFM remote end points per up/down end point. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	2,000
CFM—maximum number of dot1ag ports. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	128

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
CFM—maximum number of CFM segments. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	1,000
CFM—maximum number of MIPs. Note: With Advanced Edge license or higher.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	256
CLEAR-Flow—total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs.	ExtremeSwitching X460-G2, X770, X670-G2, X450-G2	4,094
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X870	3,072
	ExtremeSwitching X690, X590, X465, X695, 5420	8,192
	ExtremeSwitching 5520	9,215
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)—maximum number of DCBX application TLVs.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	8
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	256 (with underlying protocol RIPng) 128 (with underlying protocol OSPFv3) 1,024 (with static routes)
DHCP snooping entries—maximum number of DHCP snooping entries.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695	2,048
	ExtremeSwitching 5520	2,050
Dynamic ACLs—maximum number of ACLs processed per second. Note: Limits are load-dependent.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	
	with 50 DACLs	10
	with 500 DACLs	5

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
EAPS domains—maximum number of EAPS domains. Note: An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains. Note: You can increase the number of domains by upgrading to the Advanced Edge license.	ExtremeSwitching X670-G2, X450-G2, X460-G2, X770, X440-G2, X620, X870, X690, X590, X465, X695 ExtremeSwitching 5420, 5520	4 64
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2 ExtremeSwitching X870, X690, X590, X465, X695, 5420, 5520	1,000 2,000
ERPS domains—maximum number of ERPS domains with or without CFM configured. Note: You can increase the number of domains by upgrading to the Advanced Edge license.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695 ExtremeSwitching 5420, 5520	4 See Advanced Edge and Base License Limits on page 76
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X870, X690, X590, X465, X695, 5420, 5520 ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2	2,000 1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690 , X590, X465, X695, 5420, 5520 ExtremeSwitchingX770, X620, X440-G2	2,000 500
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X870, X690, X590 , X465, X695, 5420, 5520 ExtremeSwitching X440-G2	5,000 4,000
Extended Edge Switching maximum BPEs—maximum number of attached bridge port extenders (BPEs).	ExtremeSwitching X465, X590, X670-G2, X690, 5520	48
	ExtremeSwitching 5420	20
Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs).	ExtremeSwitching X465, X590, X670-G2, X690, 5420, 5520	2 on V400-24 and V300 models 4 on V400-48 models

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Extended Edge Switching maximum tiers—maximum number of cascade levels (tiers) of bridge port extenders (BPEs).	ExtremeSwitching X465, X590, X670-G2, X690, 5420, 5520	4 (except for V300-8P-2T-W, which support 1 tier)
Extended Edge Switching maximum ring BPEs—maximum number of bridge port extenders (BPEs) in a ring topology.	ExtremeSwitching X465, X590, X670-G2, X690, 5520	8
	ExtremeSwitching 5420	N/A
Extended Edge Switching maximum VLANs—maximum number of VLANs - Includes all VLANs	ExtremeSwitching X465, X590, X670-G2, X690, 5520	4094
	ExtremeSwitching 5420	1024
Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships.	ExtremeSwitching X465, X590, X670-G2, X690, 5520	12,000 in hash mode (default) 131,000 in port-group mode
	ExtremeSwitching 5420	8,750 in hash mode (default) 131,617 in port-group mode
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X690, X590, X465, X695, 5420, 5520	30,000 pps
	ExtremeSwitching X870	32,000 pps
	ExtremeSwitching X450-G2	16,000 pps
	ExtremeSwitching X460-G2	17,000 pps
	ExtremeSwitching X620	10,000 pps
	ExtremeSwitching X670-G2	15,000 pps
	ExtremeSwitching X770	6,500 pps
	ExtremeSwitching X440-G2	9,000 pps

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching X460-G2	49,152 [f]
	ExtremeSwitching X770, X670-G2	294,912 [f]
	ExtremeSwitching X450-G2	34,816 [f]
	ExtremeSwitching X620, X440-G2	16,384 [f]
	ExtremeSwitching X870	139,264 [f]
	ExtremeSwitching X690, X590, X465	278,528 [f]
	ExtremeSwitching X695	294,912 [f]
	ExtremeSwitching 5420M ExtremeSwitching 5420F	65,536 32,768 [f]
	ExtremeSwitching 5520	114,688 [f]
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	1,024
	ExtremeSwitching X770, X670-G2, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching 5420	1024
FDB (maximum L2 entries)—maximum number of MAC addresses.	ExtremeSwitching X460-G2	98,300 [g]
	ExtremeSwitching X770, X670-G2	294,912 [g]
	ExtremeSwitching X450-G2	68,000 [g]
	ExtremeSwitching X620, X440-G2	16,384
	ExtremeSwitching X870	139,264 [g]
	ExtremeSwitching X690, X590, X465, X695	278,528 [g]
	ExtremeSwitching X695	294,912 [g]
	ExtremeSwitching 5420M ExtremeSwitching 5420F	65,536 32,768 [g]
	ExtremeSwitching 5520	114,688 [g]
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching X770, X670-G2, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2, 5420	1,024
Identity management—maximum number of Blacklist entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	512
Identity management—maximum number of Whitelist entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	512
Identity management—maximum number of roles that can be created.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	64

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Identity management—maximum role hierarchy depth allowed.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	5
Identity management—maximum number of attribute value pairs in a role match criteria.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	16
Identity management—maximum number of child roles for a role.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
Identity management—maximum number of LDAP servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
Identity management—maximum number of Kerberos servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	20
Identity management—maximum database memory size.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	512
Identity management—recommended number of identities per switch. Note: Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	100
Identity management—recommended number of ACL entries per identity. Note: Number of ACLs per identity, based on system ACL limitation.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5520	20
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	500

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching X460-G2, X870	1,500
	ExtremeSwitching X450-G2	2,048
	ExtremeSwitching X770, X670-G2 , X695	2,000
	ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X690, X590, X465	4,000
	ExtremeSwitching 5420	1,500
	ExtremeSwitching 5520	2,500
IGMPv1/v2 SSM-map entries—maximum number of IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	500
IGMPv1/v2 SSM-map entries—maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	50
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	ExtremeSwitching X870, X690, X590, X465, X695 X770, , X670-G2, X460-G2, X450-G2, 5420, 5520	4,000
	ExtremeSwitching X440-G2, X620	3,500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching X770, X670-G2	30,000
	ExtremeSwitching X460-G2, X450-G2, 5420, 5520	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X465, X870, X690, X590, X695	45,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, 5420, 5520	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690, X590, X465, X695	4,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2 , 5420, 5520	20,000
	ExtremeSwitching X770, X670-G2	30,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690, X590, X465, X695	45,000

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IP ARP entries in software—maximum number of IP ARP entries in software. Note: Might be limited by hardware capacity of FDB (maximum L2 entries).	ExtremeSwitching X670-G2, X770	131,072 (up to)[h]
	ExtremeSwitching X460-G2	57,344 (up to)[h]
	ExtremeSwitching X450-G2	47,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	20,480
	ExtremeSwitching X870	94,206 (up to)[h]
	ExtremeSwitching X690, X590, X465	157,694 (up to)[h]
	ExtremeSwitching X695	184,318 (up to)[h]
	ExtremeSwitching 5420, 5520	74,750 (up to)[h]
IPv4 ARP entries in hardware with minimum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. Assumes number of IP route reserved entries is 100 or less.	ExtremeSwitching X870	74,000 (up to)[h]
	ExtremeSwitching X460-G2	50,000 (up to)[h]
	ExtremeSwitching X770, X670-G2	108,000 (up to)[h]
	ExtremeSwitching X450-G2	39,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590, X465	119,000 (up to)[h]
	ExtremeSwitching X695	146,000 (up to)[h]
	ExtremeSwitching 5420M models	21,000
	ExtremeSwitching 5420F models	12,000
	ExtremeSwitching 5520	60,000[h]

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is "maximum."	ExtremeSwitching X870	64,000 (up to)[h]
	ExtremeSwitching X460-G2	43,000 (up to)[h]
	ExtremeSwitching X770, X670-G2	98,000 (up to)[h]
	ExtremeSwitching X450-G2	29,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590, X465	109,000 (up to)[h]
	ExtremeSwitching X695	125,000 (up to)[h]
	ExtremeSwitching 5420M models	24,000
	ExtremeSwitching 5420F models	16,000
	ExtremeSwitching 5520	49,000[h]
IP flow information export (IPFIX)—number of simultaneous flows.	ExtremeSwitching X460-G2	2,048 ingress 2,048 egress
	ExtremeSwitching X450-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	N/A
IPv4 remote hosts in hardware with zero LPM routes—maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less.	ExtremeSwitching X870	120,000 (up to)[h]
	ExtremeSwitching X460-G2	73,000[h]
	ExtremeSwitching X770, X670-G2	176,000 (up to)[h]
	ExtremeSwitching X450-G2	61,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X690, X590, X465	216,000 (up to)[h]
	ExtremeSwitching X695	241,000 (up to)[h]
	ExtremeSwitching 5420M ExtremeSwitching 5420F	36,000 24,000[h]
	ExtremeSwitching 5520	102,000[h]

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	25,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	131,000
	ExtremeSwitching 5420, 5520	81,000
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching X460-G2, 5420	12,000
	ExtremeSwitching X450-G2	16,000
	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695	131,000 [q]
	ExtremeSwitching X620, X440-G2	480
	ExtremeSwitching 5520	81,000 [q]
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	255
	ExtremeSwitching X440-G2, X620	N/A
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	1 (per virtual router)
	ExtremeSwitching X440-G2, X620	N/A
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	255
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048
	ExtremeSwitching X620, X440-G2	510
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching X770, X670-G2	36,750 [h]
	ExtremeSwitching X460-G2, X870	22,000 [h]
	ExtremeSwitching X450-G2	12,000 [h]
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X690, X590, X465	24,500 [s]
	ExtremeSwitching 5420M models ExtremeSwitching 5420F models	12,000 6,000
	ExtremeSwitching 5520	18,000 [s]
	ExtremeSwitching X695	57,000 [h]

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2	25,000
	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695	65,000 [q]
	ExtremeSwitching 5420, 5520	18,000 [q]
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching X460-G2, 5420	6,000
	ExtremeSwitching X450-G2	8,000
	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695	65,000 [q]
	ExtremeSwitching X620, X440-G2	240
	ExtremeSwitching 5520	40,000 [q]
IPv6 routes with a mask greater than 64 bits in hardware—maximum number of such IPv6 LPM routes in hardware.	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695, 5520	8,192 [r]
	5420	256
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X450-G2, X460-G2	2,048
IPv6 route sharing in hardware—route mask lengths for which ECMP is supported in hardware.	ExtremeSwitching X460-G2, X450-G2, X620, 5420, 5520	0–64 >64 single path only
	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695	0–128 [r]
	ExtremeSwitching X440-G2	Not supported
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2, X770, X670-G2, X450-G2, X870, X690, X590, X465, X695	2,048
	ExtremeSwitching X620, X440-G2	510
	ExtremeSwitching 5420	1,533
	ExtremeSwitching 5520	2,048
IP multicast static routes—maximum number of permanent multicast IP routes.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	1,024
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	1,024
	ExtremeSwitching X620, X440-G2	480

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IP route sharing (maximum gateways)—Configurable maximum number of gateways used by equal cost multipath OSPF, BGP, IS-IS, static routes, or L2VPNs. Static routes, OSPF, and BGP are limited to 64 ECMP gateways per destination, while IS-IS is limited to 8. L2VPNs are limited to 16 LSPs per pseudowire on platforms that support 32 gateways, and 64 LSPs per pseudowire on platforms that support 64 gateways.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X770, X620, X870, X690, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching 5420, 5520	2, 4, or 8
	ExtremeSwitching X440-G2	N/A

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
IP route sharing (total combinations of gateway sets)—maximum number of combinations of sets of adjacent gateways used by multipath OSPF, BGP, IS-IS, or static routes.	ExtremeSwitching X670-G2, X770	
	if maximum gateways is 2	1,022
	if maximum gateways is 4	1,022
	if maximum gateways is 8	1,022
	if maximum gateways is 16 (default)	1,022
	if maximum gateways is 32	510
	if maximum gateways is 64	254
	ExtremeSwitching X460-G2, X450-G2	
	if maximum gateways is 2	1,022
	if maximum gateways is 4	1,022
	if maximum gateways is 8	510
	if maximum gateways is 16 (default)	254
	if maximum gateways is 32	126
	if maximum gateways is 64	62
	ExtremeSwitching X620	
	if maximum gateways is 2	126
	if maximum gateways is 4	126
	if maximum gateways is 8	126
	if maximum gateways is 16 (default)	126
	if maximum gateways is 32	62
	if maximum gateways is 64	30
	ExtremeSwitching X690, X590, X465, X695	
	if maximum gateways is 2	4,094
	if maximum gateways is 4	4,094
	if maximum gateways is 8	2,046
	if maximum gateways is 16 (default)	1,022
	if maximum gateways is 32	510
	if maximum gateways is 64	254
	Note: The values here represent the maximum attainable ECMP groups of which, due to the RIOT feature, half are reserved for overlay and half for underlay routing. For more information about RIOT, see the *ExtremeXOS 31.3 User Guide*.	
	ExtremeSwitching X870	
	if maximum gateways is 2	2,046
	if maximum gateways is 4	2,046
	if maximum gateways is 8	2,046

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
	if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	1,022 510 254
	ExtremeSwitching X440-G2	N/A
	ExtremeSwitching 5420 Note: The values here represent the maximum attainable ECMP groups of which, due to the RIOT feature, half are reserved for overlay and half for underlay routing. For more information about RIOT, see the *ExtremeXOS 31.3 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 the *ExtremeXOS 31.3 User Guide*.	2046 (if maximum gateways is 2) 1022 (if maximum gateway is 4) 510 (if maximum gateways is 8)
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	255
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	9,216
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch—maximum number of VCCV enabled VPLS VPNs.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	16 N/A
L2 VPN: VPLS MAC addresses—maximum number of MAC addresses learned by a switch.	ExtremeSwitching X770 ExtremeSwitching X670-G2, X690, X590, X465 ExtremeSwitching X460-G2 ExtremeSwitching X870 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	128,000 140,000 55,000 65,000 N/A
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	ExtremeSwitching X460-G2, X770, X670-G2, X870, X690, X590, X465 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	1,023 N/A

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
L2 VPN: VPLS peers—maximum number of VPLS peers per VPLS instance.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465	64
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	N/A
L2 VPN: LDP pseudowires—maximum number of pseudowires per switch.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465	7,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	N/A
L2 VPN: static pseudowires—maximum number of static pseudowires per switch.	ExtremeSwitching X670-G2, X460-G2, X770, X870, X690, X590, X465	7,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	N/A
L2 VPN: Virtual Private Wire Service (VPWS) VPNs—maximum number of virtual private networks per switch.	ExtremeSwitching X670-G2, X870, X690, X590, X465	4,090
	ExtremeSwitching X460-G2	1,023
	ExtremeSwitching X770	4,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5420, 5520	N/A
Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. Note: • The internal lookup table configuration used is "l2-and-l3". • IPv6 and IPv4 L2 IPMC scaling is the same for this mode. • Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are the same.	ExtremeSwitching X770, X670-G2, X695	73,000
	ExtremeSwitching X460-G2	24,000
	ExtremeSwitching X450-G2	14,000
	ExtremeSwitching X620, X440-G2	5,000
	ExtremeSwitching X870	36,000
	ExtremeSwitching X690, X590, X465	67,000
	ExtremeSwitching 5420	64,000
	ExtremeSwitching 5520	32,768

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Layer-3 IPv4 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). Note: • Limit value is the same for MVR senders, PIM Snooping entries. PIM SSM cache, IGMP senders, PIM cache. • Assumes source-group-vlan mode as look up key. • Layer 3 IPMC cache limit in mixed mode also has the same value.	ExtremeSwitching X460-G2	26,000
	ExtremeSwitching X450-G2	21,000
	ExtremeSwitching X770, X670-G2	77,500
	ExtremeSwitching X620, X440-G2	1,500
	ExtremeSwitching X870	52,000
	ExtremeSwitching X690, X590, X465	93,000
	ExtremeSwitching X695	104,000
	ExtremeSwitching 5420M ExtremeSwitching 5420F	12,000 6,000
	ExtremeSwitching 5520	43,000
Layer-3 IPv6 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). Note: • Limit value is the same for MLD sender per switch, PIM IPv6 cache. • Assumes source-group-vlan mode as lookup key.	ExtremeSwitching X770, X670-G2	30,000
	ExtremeSwitching X460-G2	14,000
	ExtremeSwitching X450-G2	10,000
	ExtremeSwitching X620, X440-G2	700
	ExtremeSwitching X870	18,000
	ExtremeSwitching X690, X590, X465	48,000
	ExtremeSwitching X695	52,000
	ExtremeSwitching 5420M ExtremeSwitching 5420F	6,000 3,000
	ExtremeSwitching 5520	21,500
Load sharing—maximum number of load sharing groups. Note: The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.	ExtremeSwitching X450-G2, X460-G2, X670-G2, , X770 X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	128
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2	8
	For standalone: ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	32
	For stacked: ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695, 5420, 5520	64

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	ExtremeSwitching X460-G2, X450-G2, X670-G2, X770, X440-G2, X620, X870, X690, X590 , X465, X695, 5420, 5520	2,048
Maximum mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695 Note: Only two or four mirroring instances will be active at a time, depending on the mirroring filter added to it. There are four hardware resource slots. Each single instance uses one such slot, while each ingress plus egress instance uses two slots. You can use a total of four slots, while there are no more than two egress instances. The maximum possible combination for mirroring instances: 1. 4 ingress 2. 3 ingress + 1 egress 3. 2 ingress + 2 egress 4. 2 (ingress + egress) 5. 1 (ingress + egress) + 2 ingress 6. 1 (ingress + egress) + 1 egress + 1 ingress	16 (including default mirroring instance)
	ExtremeSwitching X620, X440-G2 Note: For stacks containing X620 or X440-G2, maximum supported egress mirror instances is 1. ExtremeSwitching 5420, 5520	1 (egress) 4 total, 2 egress
Mirroring (filters)—maximum number of mirroring filters. Note: This is the number of filters across all the active mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	128

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. Note: This is the number of filters across all the active mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	16
MLAG ports—maximum number of MLAG ports allowed.	ExtremeSwitching X670-G2, X690, X695	71
	ExtremeSwitching X440-G2, X450-G2	51
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X770	103
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X590,	35
	ExtremeSwitching X465	55
	ExtremeSwitching 5420, 5520	59
MLAG peers—maximum number of MLAG peers allowed.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	2
MPLS RSVP-TE interfaces—maximum number of interfaces.	ExtremeSwitching X460-G2, X670-G2, X770, X590, X465, X870	32
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X590,X690, X465	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690 X590, X465	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	ExtremeSwitching X460-G2, X670-G2, X770	2,000
	ExtremeSwitching X870, X690, X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
MPLS RSVP-TE paths—maximum number of paths.	ExtremeSwitching X460-G2, X770	1,000
	ExtremeSwitching X670-G2, X870, X690, X590, X465	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	ExtremeSwitching X460-G2, X770	1,000
	ExtremeSwitching X670-G2, X870, X690 X590, X465	2,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690 X590, X465	64
	ExtremeSwitching X450-G2, and ExtremeSwitching X440-G2, X620, X695, 5420, 5520	N/A
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	ExtremeSwitching X770	64
	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465	128
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	ExtremeSwitching X460-G2	50
	ExtremeSwitching X770, X670-G2, X870, X690 X590, X465	64
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690 X590, X465	2,048
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	ExtremeSwitching X770	64
	ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465	128
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690 X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch.	ExtremeSwitching X670-G2, X460-G2, X770, X870, X690 X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS static egress LSPs—maximum number of static egress LSPs.	ExtremeSwitching X460-G2	7,116
	ExtremeSwitching X770, X870, X690, X590, X465, X670-G2	8,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS static ingress LSPs—maximum number of static ingress LSPs.	ExtremeSwitching X460-G2, X870, X690 X590, X465	4,000
	ExtremeSwitching X770, X670-G2	2,048
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
MPLS static transit LSPs—maximum number of static transit LSPs	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690 X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, X695, 5420, 5520	N/A
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	ExtremeSwitching X460-G2, X770, X670-G2, X870	768
	ExtremeSwitching X450-G2	508
	ExtremeSwitching X620, X440-G2	256
	ExtremeSwitching X690, X590, X465, X695	1,500
	ExtremeSwitching 5420	1,500
	ExtremeSwitching 5520	1,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n]	ExtremeSwitching X770, X670-G2, X450-G2, X460-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590, X465, X695, 5420, 5520	4,000
Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n]	ExtremeSwitching X460-G2, X450-G2, X620, X440-G2, 5420, 5520	10,000
	ExtremeSwitching X770, X670-G2	30,000
	ExtremeSwitching X870, X690, X590, X465, X695	45,000
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n]	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, 5420, 5520	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590, X465, X695	4,000

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n]	ExtremeSwitching X770, X670-G2	30,000
	ExtremeSwitching X460-G2, X450-G2, X620, X440-G2, 5420, 5520	10,000
	ExtremeSwitching X870, X690, X590, X465, X695	45,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	200
Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	500
	ExtremeSwitching X440-G2, X620	50
Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	50
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	1,024
Network Login—maximum number of clients being authenticated with policy mode enabled with TCI overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465, 5420, 5520	1,024
	ExtremeSwitching X670-G2, X770, X870, X690, X695	512
	ExtremeSwitching X620, X440-G2	256
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching X460-G2, X450-G2, X670-G2, X770, X870, X690, X590, X465, X695	2,000
	ExtremeSwitching X440-G2, X620, 5420, 5520	1,024
Network Login VLAN VSAs—maximum number of VLANs a client can be authenticated on at any given time.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	10
Network Service Identifiers (NSI)/ VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	94
Network Address Translation (NAT) VLANs—maximum number of NAT VLANs.	ExtremeSwitching X465, X590, X690, X695, X870	4
Network Address Translation (NAT) Sessions—number of NAT sessions supported (non twice-NAT).	ExtremeSwitching X465, X590, X690, X695, X870	1,024

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Node Alias—maximum number of entries per slot.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770 X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8,192
ONEPolicy Roles/Profiles—maximum number of policy roles/ profiles.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	63
ONEPolicy Rules per Role/Profile—maximum number of rules per role/policy.	ExtremeSwitching X450-G2, X460-G2	IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256
	ExtremeSwitching X670-G2, X770, X870	IPv6 Rules: 256 L2 Rules: 184 MAC Rules: 256 IPv4 Rules: 256
	ExtremeSwitching X620, X440-G2	IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch)
	ExtremeSwitching X465, X690, X590, X695	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440
	ExtremeSwitching 5420, 5520	4,024
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465, 5420, 5520	1,024
	ExtremeSwitching X670-G2, X770, X690, X870, X695	512
	ExtremeSwitching X620, X440-G2	256
	Stacking	Depends on the stack nodes, but the maximum is 65,535.

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch with TCI-Overwrite disabled. Note: The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X690, X590, X465	24,576
	ExtremeSwitching X670-G2, X460-G2, X870, X695	12,288
	ExtremeSwitching X770, X450-G2	6,144
	ExtremeSwitching X620, X440-G2	1,536
	Stacking	1,536–65,534
	ExtremeSwitching 5420, 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 X450-G2, X770	6,144
	ExtremeSwitching X460-G2, X670-G2, X870, X695	12,288
	ExtremeSwitching X690, X590, X465	24,576
	ExtremeSwitching X440-G2, X620	1,536
	ExtremeSwitching 5420, 5520	9,216
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port with only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465, 5420, 5520	1,024
	ExtremeSwitching X670-G2, X770, X870, X690, X695	512
	ExtremeSwitching X620, X440-G2	256
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X690, X590, X465, X695	1,976
	ExtremeSwitching 5420, 5520	4,024
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590, X465, X695	512
	ExtremeSwitching 5420, 5520	1,024
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590, X465, X695	512
	ExtremeSwitching 5420, 5520	1,024

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870	256
	ExtremeSwitching X690, X590, X465, X695	512
	ExtremeSwitching 5420, 5520	1,024
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X690, X590, X465, X695	440
	ExtremeSwitching 5420, 5520	952
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465 , X695, 5420, 5520	256 [O]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465, X695, 5420, 5520	32 [O]
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching X770	103
	ExtremeSwitching X670-G2	63
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X690, X695	71
	ExtremeSwitching X590, X465	31
	ExtremeSwitching 5420, 5520	36
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. Note: This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695	1,024
	ExtremeSwitching X450-G2	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
	ExtremeSwitching 5420, 5520	960

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695	1,280
	ExtremeSwitching X450-G2	597
	ExtremeSwitching X440-G2, X620	255
	ExtremeSwitching 5420, 5520	960
PTP/1588v2 Clock Ports	ExtremeSwitching X770, X460-G2, X670-G2	31 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695, 5420, 5520	N/A
PTP/1588v2 Clock Instances	ExtremeSwitching X770, X670-G2, X460-G2	2 combinations: • Transparent clock + ordinary clock • Transparent clock + boundary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590 , X695, 5420, 5520	N/A
PTP/1588v2 Unicast Static Slaves	ExtremeSwitching X770, X670-G2, X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590 , X695, 5420, 5520	N/A
PTP/1588v2 Unicast Static Masters	ExtremeSwitching X770, X670-G2, X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695 , 5420, 5520	N/A
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	ExtremeSwitching X770, X670-G2, X460-G2, X440-G2, X620, X870, X690, X590 , X465 , X695, 5420, 5520	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	ExtremeSwitching X670-G2, X460-G2, X770, X450-G2, X870, X690, X590 , X465, X695, 5420, 5520	256
	ExtremeSwitching X440-G2, X620	128

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
RIPng learned routes—maximum number of RIPng routes.	ExtremeSwitching X670-G2, X460-G2, X770, X450-G2, X870, X690, X590 , X465, X695, 5420, 5520	3,000
	ExtremeSwitching X440-G2, X620	N/A
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching X450-G2, X770, X670-G2, X460-G2, X620, X870, X690, X590 , X465, X695, 5420, 5520	64
	ExtremeSwitching X440-G2	32
Spanning Tree PVST+—maximum number of port mode PVST domains. Note: For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, ExtremeSwitching X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching X770, X670-G2, X620	256
	ExtremeSwitching X460-G2, X450-G2, X440-G2, 5420, 5520	128
	ExtremeSwitching X870, X690, X590 , X465, X695	384
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X870, X690, X590 , X465, X695, 5420, 5520	64
	ExtremeSwitching X440-G2	32
Spanning Tree—maximum number of VLANs per MSTI. Note: Maximum number of 10 active ports per VLAN when all 500 VLANs are in one MSTI.	ExtremeSwitching X770, X670-G2	500
	ExtremeSwitching X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695, 5420, 5520	600
	ExtremeSwitching X440-G2	256
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695, 5420, 5520	1,024
	ExtremeSwitching X440-G2	512
Spanning Tree (802.1d domains)—maximum number of 802.1d domains per port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465, X695, 5420, 5520	1
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X870, X690, X590, X465, X695, 5420, 5520	4,096
	ExtremeSwitching X440-G2	2,048

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	1,024
	ExtremeSwitching X440-G2	600
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590 , X465, X695, 5420, 5520	63
	ExtremeSwitching X440-G2, X620	16 (local-only VRs)
Virtual router forwarding (VRFs)—maximum number of VRFs that can be created on a switch. Note: * Subject to other system limitations.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590 , X465, X695, 5420, 5520	960 *
	ExtremeSwitching X440-G2, X620	16 (local-only VRFs)
Virtual router protocols per VR—maximum number of routing protocols per VR.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	8
	ExtremeSwitching X440-G2, X620	N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	64
	ExtremeSwitching X440-G2, X620	N/A
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	1,000

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLANs—includes all VLANs. Note: ExtremeXOS supports only 4,092 user-configurable VLANs. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465, X695, 5420, 5520	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465, X695, 5420, 5520	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2, X770, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048
	ExtremeSwitching X440-G2, X620	510
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X620, 5420	65,536
	ExtremeSwitching X465, X590, X670-G2, X690, X870, X695, 5420, 5520	131,585
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with the default license.	ExtremeSwitching X670-G2, X870, X690, X590 , X465, X695, 5520	32
	ExtremeSwitching 5420	5
	ExtremeSwitching X440-G2	28
	ExtremeSwitching X460-G2, X770	26
	ExtremeSwitching X620	16
	ExtremeSwitching X450-G2	29
	ExtremeSwitching X460-G2	24
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2. X870, X690, X590 , X465, X695, 5420, 5520	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching X770	103
	ExtremeSwitching X670-G2	63
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X870	127
	ExtremeSwitching X690, X695	71
	ExtremeSwitching X590, X465	31
	ExtremeSwitching 5420, 5520	36

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN. Note: This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports.	ExtremeSwitching X770, X670-G2, X465, X870, X690, X590, X695	1,024
	ExtremeSwitching X450-G2	512
	ExtremeSwitching X620	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching 5420, 5520	960
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching X450-G2, X770, X670-G2, X460-G2, X870, X690, X590, X465, X695	2,046
	ExtremeSwitching X440-G2, X620	255
	ExtremeSwitching 5520	960
VMAN CEP—maximum number of CVIDs. Note: With 75% hash table utilization.	ExtremeSwitching X440-G2	1,500
	ExtremeSwitching X450-G2	6,000
	ExtremeSwitching X460-G2, X670-G2, X870	12,000
	ExtremeSwitching X590, X690, X465	24,000
	ExtremeSwitching 5420	768
	ExtremeSwitching 5520	9,000
XML requests—maximum number of XML requests per second. Note: Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	10 with 100 DACLs
XNV authentication—maximum number of VMs that can be processed (combination of local and network VMs).	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	2,048
	ExtremeSwitching X450-G2, X440-G2, X620	1,024
XNV database entries—maximum number of VM database entries (combination of local and network VMs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	16,000
XNV database entries—maximum number of VPP database entries (combination of local and network VPPs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs /local VMs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048

Table 9: Supported Limits for Edge License (continued)

Metric	Product	Limit
XNV local VPPs—maximum number of XNV local VPPs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048 ingress 512 egress
XNV policies/dynamic ACLs—maximum number of policies/ dynamic ACLs that can be configured per VPP.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs.[p]	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048 ingress 512 egress

Advanced Edge and Base License Limits

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

Table 10: Supported Limits for Advanced Edge and Base License

Metric	Product	Limit
BGP auto-peering—maximum number of auto-peering nodes and VTEPs.	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695, 5420, 5520	64
BGP auto-peering attached IPv4 hosts— maximum number of attached IPv4 hosts.	ExtremeSwitching X670-G2, X770 ExtremeSwitching X870, X690, X590, X465, X695, 5420, 5520	16,000 64,000
BGP auto-peering attached IPv6 hosts— maximum number of attached IPv6 hosts.	ExtremeSwitching X670-G2, X770 ExtremeSwitching X870, X690, X590, X465, X695, 5420, 5520	254 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 X670-G2, X770, ExtremeSwitching X690, X870, X590, X465, X695, 5420, 5520 ExtremeSwitching 5420, 5520	16* 4*
BGP auto-peering maximum IPv4 prefixes with ECMP—Maximum number of IPv4 Network prefixes with ECMP.	ExtremeSwitching X670-G2, X770, ExtremeSwitching X690, X870, X590, X465, X695 ExtremeSwitching 5420, 5520	64,000 16,000
BGP auto-peering maximum IPv6 prefixes with ECMP—Maximum number of IPv6 Network prefixes with ECMP.	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695 ExtremeSwitching 5420, 5520	8,000 254
BGP auto-peering MLAG peers—maximum MLAG peers per AutoBGP node.	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695, 5420, 5520	1

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

Metric	Product	Limit
BGP auto-peering VRFs—maximum number of VRFs.	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695, 5420, 5520	64
BGP auto-peering EVPN instances—maximum EVPN instances.	ExtremeSwitching X670-G2, X770, X690, X870, X590, X465, X695, 5420, 5520	1,024
EAPS domains—maximum number of EAPS domains. Note: An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains.	ExtremeSwitching X870, X690, X590, X465, X695	128
	ExtremeSwitching X670-G2, X450-G2, X460-G2, X770, 5420, 5520	64
	ExtremeSwitching X440-G2, X620	32
EAPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X440-G2, X620, 5420, 5520	500
	ExtremeSwitching X870, X690, X590, X465, X695	2,000
ERPS domains—maximum number of ERPS domains without CFM configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	32
ERPS domains—maximum number of ERPS domains with CFM configured.	ExtremeSwitching X450-G2, X670-G2, X770, X620, X870, X690, X590, X465, X695, 5420, 5520	16
	ExtremeSwitching X460-G2	32
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5420, 5520	2,000
	ExtremeSwitching X770, X620, X440-G2	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5420, 5520	2,000
	ExtremeSwitching X770, ExtremeSwitching X620, X440-G2	500
ESRP groups—maximum number of ESRP groups	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	32
ESRP domains—maximum number of ESRP domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	511
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8

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

Metric	Product	Limit
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	1
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590, X465, X695	64
	ExtremeSwitching 5420, 5520	8
	ExtremeSwitching X620	4
	ExtremeSwitching X440-G2	N/A
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	8
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X770, X670-G2, X460-G2, 5520	5,000
	ExtremeSwitching 5420	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	2,400
OSPFv2 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590, X465, X695	4,000
	ExtremeSwitching X670-G2, X460-G2, X770, 5420, 5520	2,000
	ExtremeSwitching 5420	1,600
	ExtremeSwitching X450-G2, X440-G2, X620	1,000
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	4
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching 5420	320
	ExtremeSwitching X450-G2, X620, X440-G2	4
	ExtremeSwitching X770	419
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X450-G2, X770, X670-G2, X460-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520	4

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

Metric	Product	Limit
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X770, X670-G2, X460-G2, 5520	50
	ExtremeSwitching 5420	40
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	32
	ExtremeSwitching 5420	25
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X460-G2, X670-G2, X770, 5520	16
	ExtremeSwitching 5420	12
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching 5420	7,500
	ExtremeSwitching X450-G2, X440-G2, X620	1,200
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590, X465, X695	4.000
	ExtremeSwitching X770, X670-G2, X460-G2, 5520	3,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X440-G2, X620, X590, X465, X695, 5420, 5520	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X450-G2, X770, X670-G2, X460-G2, X870, X690, X440-G2, X620, X590, X465, X695, 5420, 5520	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
	ExtremeSwitching 5420	12
	ExtremeSwitching X450-G2, X440-G2, X620	4
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X440-G2, X620, X690, X590, X465, X695, 5420, 5520	4

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

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590 , X465, X695, 5420, 5520	5,000
	ExtremeSwitching X440-G2, X620	1,500
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465 , X695, 5420, 5520	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465 , X695, 5420, 5520	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X440-G2, X620, X690, X590 , X465, X695, 5420, 5520	4
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	1,750
	ExtremeSwitching X450-G2	1,500
	ExtremeSwitching X440-G2, X620	550
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465 , X695, 5420, 5520	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465 , X695, 5420, 5520	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590 , X465 , X695, 5420, 5520	32
Port-specific VLAN tags—maximum number of port-specific VLAN tags.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590 , X465	1,023
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520, X695	N/A

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

Metric	Product	Limit
Port-specific VLAN tags—maximum number of port-specific VLAN tag ports.	ExtremeSwitching X460-G2, X770, X670-G2, X870, X690, X590, X465	4,000
	ExtremeSwitching X450-G2, X440-G2, X620, 5420, 5520, X695	N/A
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X460-G2	65,536
	ExtremeSwitching 5420	60,000
	ExtremeSwitching X465, X590, X670-G2, X690, X870, X695, 5520	131,585
VRRP (v2/v3-IPv4) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs):	
	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048
	ExtremeSwitching X440-G2, X620	128
	Sliced Mode:	
	ExtremeSwitching 5420, 5520	511
VRRP (v3-IPv6) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge or Base license, or higher. (VRRP-VRRPv3-IPv6) Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs):	
	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5420, 5520	2,048
	ExtremeSwitching X440-G2, X620	128
VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch.	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2 X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520 Note: With Advanced Edge license or higher.	255

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

Metric	Product	Limit
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN.	ExtremeSwitching X770, X670-G2, X460-G2, X450-G2 X440-G2, X620, X870, X690, X590, X465, X695, 5420, 5520 Note: With Advanced Edge license or higher.	255
VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520 Note: With Advanced Edge license or higher.	8
VRRP (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8 (20 centisecond or 1 second hello interval)
VRRP (v3-IPv6) (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8 (20 centisecond or 1 second hello interval)
VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)—maximum number of IP route tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
VRRP (v2/v3-IPv4/IPv6)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695, 5420, 5520	8
VXLAN—maximum virtual networks. Note: Every VPLS instance/PSTag VLAN reduces this limit by 1. Note: Assumption is all BUM (broadcast/unknown-unicast/multicast) FDB entries are pointing to the same set of RTEPs when all VNETs use explicit flooding. Depends on whether all VNETs use standard or explicit and the number of tenant VLAN ports.	ExtremeSwitching X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520 ExtremeSwitching 5420 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	2,048–4,000 200-375 N/A
VXLAN—maximum tenant VLANs plus port combinations Note: Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	ExtremeSwitching X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520 ExtremeSwitching 5420 ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	4,096 200-375 N/A

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

Metric	Product	Limit
VXLAN—maximum static MAC to IP bindings. Note: Every FDB entry configured reduces this limit by 1.	ExtremeSwitching X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	64,000
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—maximum RTEP IP addresses	ExtremeSwitching X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	512
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	ExtremeSwitching X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	4,000
	ExtremeSwitching 5420	375
	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	N/A
VXLAN—or replicator role, maximum number of attached leafs per switch.	ExtremeSwitching X465, X590, X670-G2, X690, X695, X870, 5420, 5520	256

Core and Premier License Limits

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

Table 11: Supported Limits for Core and Premier License

Metric	Product	Limit
Anycast RP Using PIM—maximum number of IPv4 Anycast RP set per VR.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X770, X620, X690, X870, X590, X465, X695, 5420, 5520	32
Anycast RP Using PIM—maximum number of IPv6 Anycast RP set per VR.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X770, X620, X690, X870, X590, X465, X695, 5420, 5520	32
Anycast RP Using PIM—RP peers per Anycast RP set.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X670-G2, X770, X620, X690, X870, X590, X465, X695, 5420, 5520	10
BGP (aggregates)—maximum number of BGP aggregates.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2, 5420	204
BGP (networks)—maximum number of BGP networks.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X450-G2, 5420	820

Table 11: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
BGP (peers)—maximum number of BGP peers. Note: With default keepalive and hold timers. Note: Each BGPv4/BGPv6 peer handles a maximum of 50 routes. Note: ECMP should not be enabled for BGP.	ExtremeSwitching X460-G2, X670-G2, X770, X870, 5520	128
	ExtremeSwitching , X590, X465, X695	300
	ExtremeSwitching X450-G2, 5420	100
	ExtremeSwitching X690	500
BGP (peer groups)—maximum number of BGP peer groups.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching X450-G2, 5420	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2, 5420	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X450-G2, 5420	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2, 5420	20,000
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590 , X465 , X695, 5520 (at default)	25,000
	ExtremeSwitching X870, X690, X590 , X465 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2	20,000
	ExtremeSwitching 5420	20,000
	ExtremeSwitching 5520 (with ALPM enabled)	80,000
BGP (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2, 5420	20,000
BGP ECMP—maximum number of equal cost paths per multipath for BGP and BGPv6.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X450-G2	64
	ExtremeSwitching 5420, 5520	8

Table 11: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
BGPv6 (unicast address-family routes)—maximum number of unicast address family routes.	ExtremeSwitching X460-G2, 5420, 5520	6,000
	ExtremeSwitching X670-G2, X770	8,000
	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2, 5420	4,800
	ExtremeSwitching 5520 (with ALPM enabled)	40,000
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, 5520	18,000
	ExtremeSwitching X670-G2, X770, X870, X690, X590, X465, X695	24,000
	ExtremeSwitching X450-G2, 5420	14,000
EVPN EVI instances—maximum number of EVI instances.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5420, 5520	1,024
EVPN LAGs—maximum number of LAGs.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695	128
GRE Tunnels—maximum number of GRE tunnels.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590, X465 , X695, 5420, 5520	255
	ExtremeSwitching X620, X440G2	N/A
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	128
	ExtremeSwitching X450-G2	N/A
IS-IS ECMP—maximum number of equal cost paths per multipath for IS-IS.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	2, 4, or 8
	ExtremeSwitching X450-G2	N/A
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	255
	ExtremeSwitching X450-G2	N/A
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	256
	ExtremeSwitching X450-G2	N/A
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	25,000
	ExtremeSwitching X450-G2	N/A

Table 11: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	25,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a L1/I2 router.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L2 routes in an L2 router—recommended maximum number of IS-IS Level 2 routes in a Level 2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a Level 1/Level2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	20,000
	ExtremeSwitching X450-G2	N/A
MSDP active peers—maximum number of active MSDP peers.	ExtremeSwitching X450-G2, X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5420, 5520	64

Table 11: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
MSDP SA cache entries—maximum number of entries in SA cache.	ExtremeSwitching X670-G2, X770, X690, X590, X465, X695, 5520	14,000
	ExtremeSwitching 5420M	8,000
	ExtremeSwitching 5420F	6,000
	ExtremeSwitching X460-G2	10,000
	ExtremeSwitching X870	11,000
	ExtremeSwitching X450-G2	8,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	ExtremeSwitching X450-G2, X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5420, 5520	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X670-G2, X770, X450-G2, X870, X690, X590, X465, X695	64
	ExtremeSwitching 5420, 5520	8
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X770, X670-G2, X460-G2, 5520	5,000
	ExtremeSwitching X450-G2, 5420	4,000
OSPFv2 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590, X465, X695	4,000
	ExtremeSwitching X670-G2, X460-G2, X770, 5520	2,000
	ExtremeSwitching X450-G2, 5420	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching X450-G2, 5420	320
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching X770	419
	ExtremeSwitching X450-G2, 5420	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	128
	ExtremeSwitching X450-G2, 5420	96

Table 11: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X770, X670-G2, X460-G2 , 5520	50
	ExtremeSwitching X450-G2, 5420	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5520	32
	ExtremeSwitching X450-G2, 5420	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X460-G2, X670-G2, X770, 5520	16
	ExtremeSwitching X450-G2, 5420	12
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching X450-G2, 5420	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590, X465, X695	4.000
	ExtremeSwitching X770, X670-G2, X460-G2, 5520	3,000
	ExtremeSwitching X450-G2, 5420	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X770	128
	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2, 5420	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching X450-G2, 5420	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X770, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
	ExtremeSwitching X450-G2, 5420	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	255
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	3,000 (depends on policy file limits)

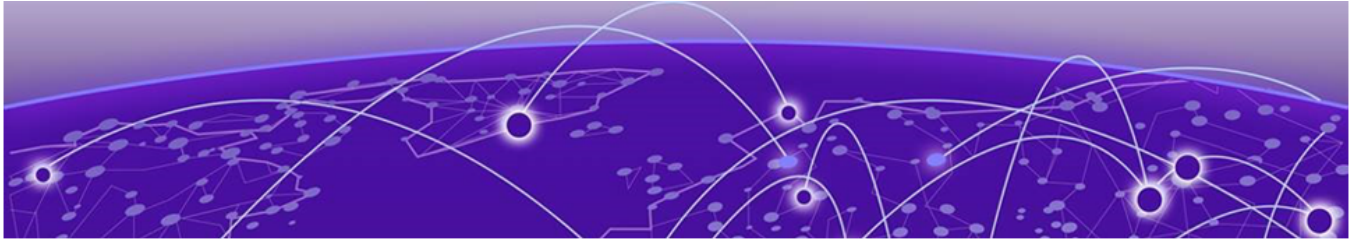
Table 11: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	255
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520 ExtremeSwitching X450-G2,	1,750 1,500
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590, X465, X695, 5420, 5520	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X870, X690, X590 , X465, X695, 5420, 5520	32

Notes for Limits Tables

[a] The table shows the total available. When installing ACL rules bound to a set of ports, rules are replicated for each port if there are ACL counters and counter compression is not enabled, or if the ports are Extended Edge Switching extended ports.
[c] When there are BFD sessions with minimal timer, sessions with default timer should not be used.
[f] Effective capacity varies based on actual MAC addresses and VLAN IDs used and hash algorithm selected.
[g] Based on "configure forwarding internal-tables more l2".

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



Open Issues, Known Behaviors, and Resolved Issues

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

Open Issues

The following are new open issues for supported features found in ExtremeXOS 31.3.

Table 12: Open Issues, Platform-Specific, and Feature Change Requests (CRs)

Defect Number	Description
ExtremeSwitching 5420 Series Switches	
EXOS-28759	On the ExtremeSwitching 5420 series switch VPEX cascade setup with MSTP CIST, if restricted-role is enabled on BPE, extended ports control bridge reboots.

Known Behaviors

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

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

Defect Number	Description
General	
EXOS-27922	Beginning with ExtremeXOS 31.2, PTPv2 is not supported on X460-G2 and X670-G2 switches.
EXOS-28479	For ExtremeSwitching 5520 and 5420 series switches, inner tag dot1P is not examined with LAG.
EXOS-29242	Multihop EBGP sessions established over GRE tunnels configured in user VR do not appear when there are more than 5 sessions.

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

Defect Number	Description
ExtremeSwitching 5420 Series Switches	
EXOS-28685	Path MTU discovery and IP fragmentation does not work when a packet is L3 routed to a VPEX extended port on the ExtremeSwitching 5420 series switch controlling bridge platform. Other controlling bridges are not affected.

EXOS-28964	Due to limited RAM, the following warn logs are observed when attempting to install a summit-arm image in a 5420 or 5420 stack:
	`<Warn:EPM.Upgrade.State> Upgrade status Installation time may be greater than expected due to a lack of memory resources`
	`<Warn:HAL.Sys.Warning> Switch low on Memory. OS KBytes total 1002660 free 4992. This can occur normally during image upgrade.`

Extended Edge Switching	
EXOS-29130	GRE Tunnel IPv4 traffic software gets forwarded if extended port is used in the tunnel transport VLAN.
SummitStacking	
EXOS-28766	A file system corruption occurs when a USB clone tar saved with ExtremeXOS 31.3 is used for cloning by an ExtremeXOS or earlier release. Workaround: Upgrade the device to ExtremeXOS 31.3 before performing the clone.

Resolved Issues in ExtremeXOS 31.3.1-Patch1-10

The following issues were resolved in ExtremeXOS 31.3.1-Patch1-10. ExtremeXOS 31.3.1-Patch1-10 includes all fixes up to and including the following versions: 11.6.5.3 and earlier, 12.0.5, 12.1.7, 12.2.2-patch1-12, 12.3.6, 12.4.5, 12.5.5, 12.6.3, 12.6.5, 12.7.1, 15.1.5, 15.2.4, 15.3.3, 15.4.1, 15.5.1, 15.5.2, 15.6.1, 15.6.2, 15.7.1, 16.1, 16.1.2, 16.1.3, 21.1, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 31.1, 31.2, and 31.3. For information about those fixes, see the release notes for the specific release.

Table 14: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.3.1-Patch1-10

Defect Number	Description
Universal Hardware	
EXOS-29385	Auto upgrade U-Boot version to 2.3.2.3.
EXOS-29877	Upgrade Operational diagnostics version to 0.0.2.5.
ExtremeSwitching 5420 Series Switches	
EXOS-29808	Support for ExtremeSwitching 5420 series switches with Hardware Revision AC.

Resolved Issues in ExtremeXOS 31.3.1-Patch1-5

The following issues were resolved in ExtremeXOS 31.3.1-Patch1-5. ExtremeXOS 31.3.1-Patch1-5 includes all fixes up to and including the following versions: 11.6.5.3 and earlier, 12.0.5, 12.1.7, 12.2.2-patch1-12, 12.3.6, 12.4.5, 12.5.5, 12.6.3, 12.6.5, 12.7.1, 15.1.5, 15.2.4, 15.3.3, 15.4.1, 15.5.1, 15.5.2, 15.6.1, 15.6.2, 15.7.1, 16.1, 16.1.2, 16.1.3, 21.1, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 31.1, 31.2, and 31.3. For information about those fixes, see the release notes for the specific release.

Table 15: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.3.1-Patch1-5

Defect Number	Description
General	
EXOS-29388	L2 traffic gets flooded in MLAG due to a miss in FDB checkpointing between MLAG peers.
ExtremeSwitching 5420 Series Switches	
EXOS-29386	The default state of 1G auto-negotiation on 10G fiber ports depends on hardware capability, which can result in variations between the Universal Hardware (5420) platform and different operating systems (VOSS/EXOS). This can create a configuration mismatch, resulting in link loss when a variety of Universal Hardware and operating systems are used in the customer environment.
EXOS-29385	Auto upgrade U-Boot version to 2.3.2.3.
EXOS-29387	ExtremeSwitching 5420 series switch control plane CPU congestion, caused by heavy CPU-bound traffic, results in unexpected and undesirable drops for some other types of CPU-bound traffic. This can cause control plane learning or protocol convergence issues.

Resolved Issues in ExtremeXOS 31.3

The following issues were resolved in ExtremeXOS 31.3. ExtremeXOS 31.3 includes all fixes up to and including the following versions: 11.6.5.3 and earlier, 12.0.5, 12.1.7, 12.2.2-patch1-12, 12.3.6, 12.4.5, 12.5.5, 12.6.3, 12.6.5, 12.7.1, 15.1.5, 15.2.4, 15.3.3, 15.4.1, 15.5.1, 15.5.2, 15.6.1, 15.6.2, 15.7.1, 16.1, 16.1.2, 16.1.3, 21.1, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 31.1, and 31.2. For information about those fixes, see the release notes for the specific release.

Table 16: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.3

Defect Number	Description
General	
EXOS-26767	A log message is generated on the clock reset, indicating that the battery needs to be replaced or other hardware issue.
EXOS-27554	Ubiquiti AP does not power up on some EXOS switches.
EXOS-27895	IQAgent enables DHCP on Management VLAN every 2 minutes when the management port is down.
EXOS-27956	HAL process ends unexpectedly when there is frequent link flap in the Software Redundant Port (SRP).

Table 16: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.3 (continued)

Defect Number	Description
EXOS-27997	HAL process spikes more than 50% when the backup slot is powered down.
EXOS-28145	The **Save configuration** button does not work in the Chalet web application.
EXOS-28306	Memory depleted at the kernel level due to bootprelay packet processing.
EXOS-28417	Kernel crash is observed when IP defragmentation fails.
EXOS-28524	ExtremeSwitching 5520 series switch upgraded from EXOS 31.1 to EXOS 31.2 encountered a management interface communication problem after upgrade.
ExtremeSwitching X460 Series Switches	
EXOS-28154	Restrict users to add the port manually to a VLAN when the port is already added by the netlogin process.
ExtremeSwitching X670-G2 Series Switches	
EXOS-28303	RTMGR process crashed with signal 11 while routes are deleted/added when running **`disable/enable ospf`** on a peer switch.
ExtremeSwitching X690 Series Switches	
EXOS-28684	With MVRP enabled on LAG ports, MRP process ends unexpectedly when running the **`show mvrp tag`** command.
ExtremeSwitching X465 Series Switches	
EXOS-27935	DHCP broadcast packets are flooded through the client port in non-policy netlogin mode when broadcast flooding is disabled on ports.
ExtremeSwitching X435 Series Switches	
EXOS-28820	For the ExtremeSwitching X435 series switch, the default VR name is not showing in syslog configuration.
ExtremeSwitching 5520 Series Switches	
EXOS-28957	ExtremeSwitching 5520 series switch reboots on license revocation after NOS switch from VOSS to EXOS.
ACL	
EXOS-27299	Time-to-live (TTL) match condition is not updated during ACL smart refresh.
BGP	
EXOS-28346	For several directly attached BGP Neighbors, there is a long delay to come into the established state after reboot.
DHCP	
EXOS-10868	L2VLAN DHCP packets are forwarded by the switch when discover packets received on subvlan and L2VLAN at the same time.
ExtremeCloud IQ	
EXOS-28750	Port flap is observed when configuring auto 'on' for the first time after switch reboot.
Extended Edge Switching	

Table 16: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.3 (continued)

Defect Number	Description
EXOS-27933	For the ExtremeSwitching 5520 series VPEX ring, PIM IPv6 cache is not programmed properly in ECMP active path flap event.
OnePolicy	
EXOS-28389	OnePolicy access-list is not accepted if the name starts with number.
STP	
EXOS-26784	`disable stpd s0` is displayed twice in the configuration if STP is disabled and if the default STPD mode of the s0 domain is changed.
EXOS-28440	Cannot disable the port that is already disabled by STP by running **`bpdu-restrict`**.
EXOS-28696	STP process crash is observed when configuring auto-edge.
SummitStack	
EXOS-27667	In Summit Stack, not all of the FAN serial numbers are shown under the **`show fan`** command.
EXOS-27850	ZTPstack cannot successfully configure a new switch to join the stack if the currently active Stack MAC address is based on the node that is not currently present in stack.
EXOS-27988	Redundant port configured through SRP fails to link-up after rebooting peer devices.
VLAN	
EXOS-29020	ifAlias is truncated to 7 characters in 64-bit platforms and 3 characters in 32-bit platforms.