ExtremeXOS Release Notes

Software Version ExtremeXOS 31.2

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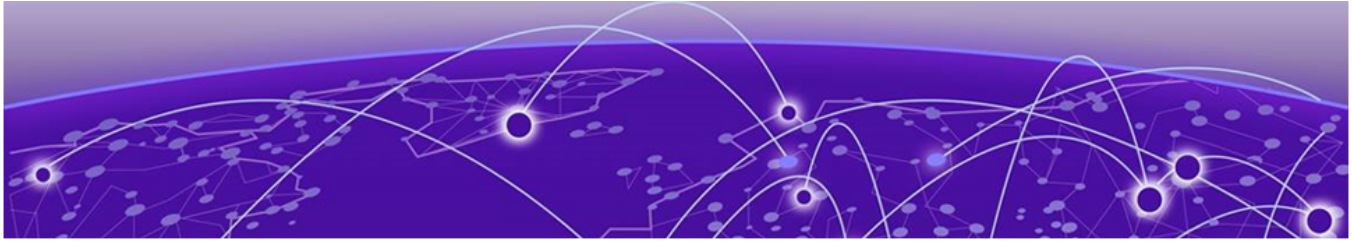

Table of Contents

Preface

This section describes the text conventions used in this document, where you can find additional information, and how you can provide feedback to us.

Conventions

This section discusses the conventions used in this guide.

Text Conventions

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

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

Table 1: Notes and warnings

Icon	Notice type	Alerts you to...
	Tip	Helpful tips and notices for using the product.
	Note	Useful information or instructions.
	Important	Important features or instructions.

Table 1: Notes and warnings (continued)

Icon	Notice type	Alerts you to...
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.

Table 2: Text

Convention	Description
`screen displays`	This typeface indicates command syntax, or represents information as it appears 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 switch 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 *switch*.

Providing Feedback

The Information Development team at Extreme Networks has made every effort to ensure the accuracy and completeness of this document. We are always striving to improve our documentation and help you work better, 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 in the document.
- Broken links or usability issues.

If you would like to provide feedback, you can do so in three ways:

- In a web browser, select the feedback icon and complete the online feedback form.
- 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.

Getting Help

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.

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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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1. Go to www.extremenetworks.com/support/service-notification-form.
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Note
You can modify your product selections or unsubscribe at any time.

4. Select **Submit**.

Related Publications

ExtremeXOS Publications

- *ACL Solutions Guide*
- *ExtremeXOS 31.2 Command Reference Guide*
- *ExtremeXOS 31.2 EMS Messages Catalog*
- *ExtremeXOS 31.2 Feature License Requirements*
- *ExtremeXOS 31.2 User Guide*
- *ExtremeXOS Quick Guide*
- *ExtremeXOS Release Notes*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*

- *Extreme Optics Compatibility*
- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*
- *Using AVB with Extreme Switches*

Extreme Management Center Publications

- *Extreme Management Center User Guide*

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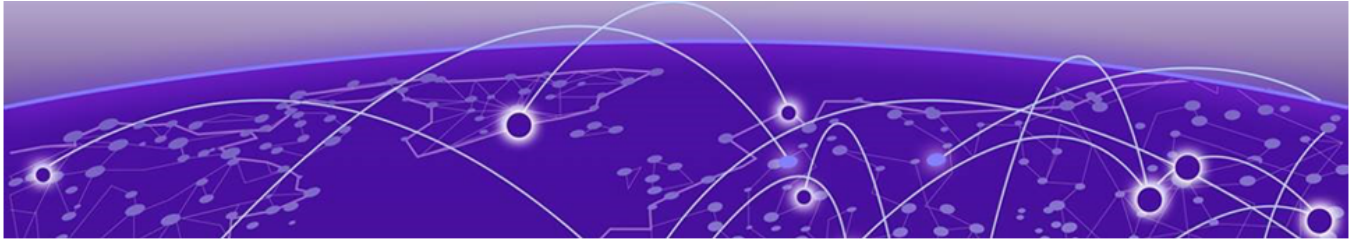


Overview

These release notes document ExtremeXOS 31.2, which adds features and resolves software deficiencies.

Security Information

The following section covers important security information for ExtremeXOS 31.2.

Linux Kernel

ExtremeXOS 31.2 uses Linux Kernel 4.14.

OpenSSL Version

ExtremeXOS 31.2 uses FIPS openssl-fips-2.0.16.

Upgrading ExtremeXOS

For instructions about upgrading ExtremeXOS software, see "Software Upgrade and Boot Options" in the *ExtremeXOS 31.2 User Guide*.

Beginning with ExtremeXOS 12.1, 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`*`} | `**`memorycard`** *`filename`*`] {`*`partition`*`}`
3. Restart all nodes in the new release using `reboot {[`**`time`** *`mon day year hour min sec`*`] | `**`cancel`**`} {`**`slot`** *`slot-number`*`} {`**`all`**`}`

Extended Edge Switching Image Download Issue

If you are upgrading an Extended Edge Switching configuration (controlling bridge (CB) and bridge port extenders (BPEs)) from either ExtremeXOS 22.7.1 or earlier or ExtremeXOS 30.2.1 or earlier to ExtremeXOS 30.3 or later, you cannot upgrade automatically using the combined `.lst` file. Instead, you must perform a manual upgrade. ExtremeXOS 22.7.1-Patch1-3 and later do *not* have this issue.

To perform a manual upgrade:

1. Upgrade the CBs using `.xos` file.
2. Upgrade the BPEs using the `.xmod` file.

For more information about manual upgrades, see the *Manual Upgrading* section in the *Extended Edge Switching Chapter* in the *ExtremeXOS 31.2 User Guide*.

After this one-time upgrade, you can perform all subsequent ExtremeXOS upgrades automatically using the `.lst` file. For more information about automatic upgrades, see the *Automatic Upgrading* section in the *Extended Edge Switching Chapter* in the *ExtremeXOS 31.2 User Guide*.

If you attempt the upgrade with the `.lst` file, and the following error occurs:

```
# download image 192.0.2.99 onie-30.4.1.2-vpex_controlling_bridge.lst
Note: The inactive partition (secondary) will be used for installation.
Downloading tftp://192.0.2.99/onie-30.4.1.2-vpex_controlling_bridge.lst
..................
Extracting /scratch/dnld/onie-30.4.1.2.xos from tftp://192.0.2.99/onie-30.4.1.2-
vpex_controlling_bridge.lst
Error: Cannot install /scratch/dnld/onie-30.4.1.2.xos. [Errno 28] No space left on device
```

Retry the upgrade using the manual upgrade procedure described above.

If manual installation of the `.xos` or `.xmod` file fails with the same error, the `.lst` file may still be present. To remove this file, use the following command before retrying the manual upgrade procedure:

```
# run script shell.py "rm /scratch/dnld/*"
```

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 31.2 User Guide*.

Open vSwitch Database Management Protocol (OVSDB) End of Support

Open vSwitch Database Management Protocol (OVSDB) is not supported starting with ExtremeXOS 30.5.

For users interested in using OVSDB, the most stable version of ExtremeXOS for OVSDB support is 16.2.

Default ExtremeXOS® Settings

Table 4 shows the default settings for ExtremeXOS starting with version 22.6, 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	22.6	30.1	30.2	30.3	30.5	30.6	31.1	31.2
Account Lockout	After 3 consecutive login failures, account is locked for 5 minutes.							
AVB	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	22.6	30.1	30.2	30.3	30.5	30.6	31.1	31.2
BFD Strict Session Protection	N/A.	N/A.		Disabled.				
BGP	Disabled.							
Bluetooth	N/A.	N/A.		Enabled.				
BOOTP Relay	Disabled.							
CDP	Enabled.							
Configuration auto save	Disabled.							
Clear-flow	Disabled.							
Diagnostics	Admin level privileges required to show diagnostics.							
DHCP	Enabled.							
DNS Cache Resolver and Analytics	N/A.	N/A.		Disabled.				
IPFIX	Disabled.							
IP NAT								Disabled.
EAPS	Disabled.							
EDP	Enabled.	Enabled on management port.						
ELRP	Disabled.							
ESRP	Disabled.							
Extended Edge Switching (VPEX)	Disabled.							
Identity Management	Disabled.							
IGMP	Enabled, set to IGMPv2 compatibility mode.							

Table 4: Default ExtremeXOS Settings (continued)

Feature	22.6	30.1	30.2	30.3	30.5	30.6	31.1	31.2
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	N/A	Disabled.						
MLD	Disabled.							
MLD Snooping	Disabled.							
MPLS	Disabled.							
MSRP	Disabled.							
MSTP	Enabled.							
NetLogin	All types of authentication are disabled.							
NTP	Disabled.							
ONEPolicy	Disabled.							

Table 4: Default ExtremeXOS Settings (continued)

Feature	22.6	30.1	30.2	30.3	30.5	30.6	31.1	31.2
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.							
RMON	Disabled. However, even in the disabled state, the switch responds to RMON queries and sets for alarms and events.							
sFlow	Disabled.							

Table 4: Default ExtremeXOS Settings (continued)

Feature	22.6	30.1	30.2	30.3	30.5	30.6	31.1	31.2
SNMP server	Disabled.							
SSH	Disabled.							
Stacking	Disabled, except for X450-G2.	—	Disabled, except for X450-G2, X465.	—	—			
Stacking auto-discovery	N/A.	N/A.		Enabled.				
STP	Enabled.							
Syslog	Disabled.							
TACACS	Disabled.							
Telnet	Enabled.							
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-30.5.1.15.xos`
ExtremeSwitching 5520	`summit_arm` Example: `summit_arm-31.1.1.3.xos`

New and Corrected Features in ExtremeXOS 31.2

This section lists the new and corrected features supported in the 31.2 software:

ONEPolicy Dynamic ACLs at Authentication

This feature expands on the existing ability to use ONEPolicy dynamic access control lists (ACLs) by implementing them with Access-Accept responses, in addition to the previous ability to apply them with Change of Authorization (CoA).

The dynamic policy ACL feature uses the existing RADIUS Access-Accept and change of authorization (CoA) mechanism to override existing policy rules associated with a user by including a new vendor specific attribute (VSA) in the CoA and Access-Accept. When a CoA request or Access-Accept response to apply a particular set of match conditions and actions (or an action-set) is received, a look-up is performed to determine which policy profile the specified user was authenticated in, and the action-set ID specified in the CoA/Access-Accept is applied in that user's profile.

Supported Platforms

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

Limitations

- ACL style policy must be selected.
- Only a subset of the existing policy rules is allowed.
- SNMP is not supported.

ExtremeSwitching X590 and X690 Series Switches Support Audio Video Bridging (AVB)

ExtremeXOS 31.2 provides support for Audio Video Bridging (AVB) on ExtremeSwitching X590 and X690 series switches

AVB supports the deployment of professional quality audio and/or video (AV) over standard Ethernet, while coexisting with other "legacy" (or non-AV) Ethernet traffic. This supports network convergence by using one simple standard Ethernet network for all communication needs.

The ExtremeSwitching X590, X690, X870, X695, and 5520 series switches have the AVB Feature License included in the Advanced Edge or Base License. You do not need to separately purchase and install the AVB Feature License for these switches.

Supported Platforms

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

Assisted Replication with Virtual Extensible Local Area Network (VXLAN) Access Points

ExtremeXOS 31.2 adds support for access points (APs) to the Assisted Replication feature.

Assisted replication is a feature within a virtual extensible local area network (VXLAN) environment that improves efficiency of broadcast, unknown unicast, and multicast (BUM) traffic handling. More specifically, assisted replication only modifies the forwarding behavior of BUM traffic. Similar to regular Assisted Replication functionality, the role of the replicator in an AP topology includes replicating BUM traffic on behalf of the sending VXLAN VTEP (AP in this case).

Supported Platforms

ExtremeSwitching X465, X590, X670-G2, X690, X695, X870, 5520 series switches.

Ability to Enable or Disable Source Routing IP Option in the IPv4 Packet Header

ExtremeXOS 31.2 re-introduces the ability to enable or disable the processing of the loose source route or strict source route IP option in the IPv4 packet header.

Supported Platforms

ExtremeSwitching X435, X450-G2, X460-G2, X670-G2, X440-G2, X465, X590, X620, X690, X695, X870, and 5520 series switches.

Re-introduced CLI Commands

```
enable ip option loose-source-route

enable ip option strict-source-route

disable ip option loose-source-route

disable ip option strict-source-route
```

Edge Automation

The Edge Automation feature was released in ExtremeXOS 31.1 as a demonstration feature that was provided for testing purposes. For ExtremeXOS 31.2, this feature is now fully supported.

Edge Automation connects Extreme virtual tunnel endpoints (VTEPs) with other network devices, such as switches or wireless access points (APs), by establishing a VXLAN tunnel to them, thereby receiving VXLAN-encapsulated traffic from the devices. Virtual networks and local tunnel endpoints (LTEPs) must already be configured on the VTEPs, and only remote virtual tunnel endpoint (RTEP) creation is dynamic.

The information about the devices (name, IP address, MAC address, etc.) is stored in a VNI-device database. The name of this VNI-device database is set using ExtremeXOS commands or ExtremeCloud Connector.

Supported Platforms

Edge Automation is a platform-independent feature, and thus works on all platforms that support VXLAN:

ExtremeSwitching X465, X590, X670-G2, X690, X695, X870, and 5520 series switches.

Limitations

- Virtual networks and LTEPs are not configured automatically. They must be configured using existing methods.
- The VNI-device database must be reachable using Mgmt-VR.
- You can create multiple databases, but only one can be connected at a time. You can switch between databases by disconnecting one and connecting to the other.
- Before deleting a databse, you must disconnect it from Edge Automation.
- This feature works only with Extreme Campus Controller. It does not work with any third-party applications.
- Any existing limitations on dynamic RTEPs apply to RTEPs created by Edge Automation.
- If a database's password is changed, and if the same is configured on ExtremeXOS, then the connection between ExtremeXOS and the database is re-established, causing a brief loss of connectivity.
- If a network device supports multiple IP addresses, the first IPv4 address is used for RTEP creation.
- Traffic between ExtremeXOS and the database is unencrypted.

CLI Commands

```
create database database_name

delete database database_name

configure database database_name add server [ host_name | ip_address]
{port port_number} {password [encrypted encrypted_password | password ]}

configure database database_name delete server [host_name | ip_address |
all]

configure database max-retry-interval retry_interval

configure database database_name server [host_name | ip_address]
password [encrypted encrypted_password | password ]

configure automation edge [connect | disconnect] database database_name

show database database_name

show automation edge database

show automation edge devices {vni vni}
```

Internet Protocol Security (IPsec) Authentication of OSPFv3

ExtremeXOS allows OSPFv3 to use Internet Protocol Security (IPsec) to provide authentication for OSPFv3 packets and ensure security in the transmission of OSPFv3 packets between IPsec-enabled routers.

IPsec is a framework for ensuring secure private communication over IP networks and is based on standards developed by the International Engineering Task Force (IETF). IPsec provides security services at the network layer of the Open Systems Interconnection (OSI) model by enabling a system to

select required security protocols, determine the algorithms to use for the security services, and implement any cryptographic keys required to provide the requested services. IPsec can be used to protect one or more paths between a pair of hosts, between a pair of security gateways (such as switches), or between a security gateway and a host.

Supported Platforms

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

New CLI Commands

`configure **ospfv3** [{**vlan**} *vlan-name* | {**tunnel**} *tunnel-name*] **authentication** [**none** | **keychain** *keychain-name* | **ipsec spi** *spi* **esp-auth-algorithm** *algorithm* **key** [*key-string* | **encrypted** *encrypted-key-string*]`

`configure **ospfv3 virtual-link** {**routerid**} *router-identifier* {**area**} *area-identifier* **authentication** [**none** | **keychain** *keychain-name* | **ipsec spi** *spi* **esp-auth-algorithm** *algorithm* **key** [*key-string* | **encrypted** *encrypted-key-string*]`

Changed CLI Commands

The output of the following Show commands includes IPsec Authentication information.

`show ospfv3 **interfaces** {**vlan** *vlan_name* | **tunnel** *tunnel_name* | **area** *area_identifier* | **detail**}`

`show ospfv3 **virtual-link** {{**routerid**} *router_identifier* {**area**} *area_identifier*}`

Revocation Check for Certificate Signing Request (CSR)-Generated Switch Certificate

ExtremeXOS 31.2 introduces the ability to import CSR-signed certificates with the option to verify the revocation status of the switch certificate generated through CSR. When a certificate is imported using this "csr-cert" option, mandatory trust chain verification, and optional revocation check is performed.

Supported Platforms

ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, and 5520 series switches.

Changed CLI Commands

Changes are underlined.

`download ssl *ipaddress* **certificate** {**ssl-cert** | **trusted-ca** | **ocsp-signature-ca** | {**csr-cert** {**ocsp** [**on** | **off**]}} *file_name*`

`configure **ssl certificatepregenerated**{ {**csr-cert**}**pregenerated** {**ocsp** {**on** | **off**}}}`

ExtremXOS IP Network Address Translation (NAT)

Network Address Translation (NAT) maps IP addresses from one address domain (typically private IP address spaces) to an another address domain (typically public Internet IP address spaces) to provide transparent routing to end hosts. This translation is done transparently by having a NAT device translate the IP address and/or Layer 4 port of the packets.

ExtremeXOS 31.2 adds support for IP Network Address Translation (NAT).

Supported Platforms

ExtremeSwitching X465, X590, X690, X695, and X870 series switches.

Limitations

- NAT is supported for IPv4 packets only. NAT is not supported for IPv6 packets.
- NAT is not supported for IPv4 or IPv6 multicast packets.
- Application Level Gateways (ALG) is not supported.

  NAT translates IP address of an IPv4 unicast packet, and possibly TCP/UDP port in the TCP/UDP header. The contents of the payload are not modified. If IP address or L4 port are present in the payload of the packets, these fields are not modified. If the payload contents are to be modified, specific ALGs are required. Examples of protocols that require ALG, are File Transfer Protocol (FTP), Session Initiation Protocol (SIP), Real Time Streaming Protocol (RTSP), BitTorrent, Domain Name System (DNS), etc.
- Network Address Port Translation (NAPT) does not work with fragmented IP packets, and these are dropped when NAT is enabled. This is because the fragmented IP packet does not contain a valid TCP/UDP header, unless it is the first fragment.
- Twice-NAT (NAT where both source and destination IP addresses are translated) are not supported.

  Twice-NAT is typically used to interconnect subnets in two incompatible address domains—both using private addresses. Each Twice-NAT rule requires twice the number of resources compared to a basic NAT rule.
- MLAG support for NAT is not supported.
- NAT is not supported on VXLAN tenant VLANs and MPLS service VLANs
- NAT is not supported on MAC-based VLANs and Netlogin VLANs.
- NAT is not supported on VPEX switches.

New CLI Commands

```
enable ip nat

disable ip nat

show ip nat

configure ip nat add {vlan} vlan_name direction [ingress | egress |
both]

configure ip nat delete {vlan} vlan_name

show ip nat vlan {vlan_name}
```

```
show ip nat vlan counters {vlan_name}

clear ip nat counters vlan {vlan_name}

create ip nat rule rule_name type [ source-nat | napt | destination-
napt]

delete ip nat rule rule_name

configure ip nat rule rule_name source [[[src_ip_addr src_mask |
src_ipNetmask ] {{source-vr} src_vr_name} new-source new_src_ip_addr] |
none]

configure ip nat rule rule_name destination [[dst_ip_addr new-
destination new_dst_ip_addr {{vr} vr_name}] | none]

configure ip nat rule rule_name destination protocol [[[tcp | udp |
protocol_num] port port_num new-port new_port_num] | none]

configure ip nat rule rule_name egress {vlan} vlan_name

enable ip nat rule rule_name

disable ip nat rule rule_name

configure ip nat rule rule_name name new_rule_name

show ip nat rule {detail}

configure ip nat rule rule_name monitor [on | off]

show ip nat rule {rule_name} statistics {no-refresh}

configure ip nat aging-time [minutes | none]
```

ExtremeSwitching 5520 Supports Extended Edge Switching Rings

Extended Edge Switching is based on the IEEE 802.1BR specification, comprising one or two controlling bridges (CBs), and one or more bridge port extenders (BPEs). BPEs are V400 and V300 Virtual Port Extenders, and CBs are ExtremeXOS switches. In this architecture, ports on the CB or BPEs connecting to BPEs are termed cascade ports, while corresponding ports on BPEs connecting them to the CB or upstream BPEs are termed upstream ports. Ports from the BPEs connected to the rest of the network are termed extended ports.

Since the bridge port extenders (BPEs) are managed like slots in a chassis under a single management domain, multiple layers of a traditional network can be reduced from a configuration and management perspective, greatly simplifying the network operation.

Extended Edge Switching rings allow two Extended Edge Switching (VPEX) cascades to be joined together to form a control plane ring. If a link breaks or a bridge port extender (BPE) otherwise leaves, the remaining BPEs reform two data plane cascades, thus keeping both control and data plane connectivity to the controlling bridge (CB) alive.

ExtremeXOS 31.2 introduces support for the ExtremeSwitching 5520 series switches for Extended Edge Switching rings.

Supported Platforms

ExtremeSwitching X670-G2, X465, X590, X690, and 5520 series switches.

Limitations

A maximum of 8 BPEs per ring is supported.

Port-Specific VLAN Tag (PSTag) Support for Virtual Extensible LAN (VXLAN) Tenant VLANs

The port-specific (PSTag) VLAN tag allows tagged VLAN ports to be configured with tag values. When the tag is not configured, it is implicit that the tag of the tagged port is the tag of the VLAN. We call the tag of the port the "port tag", and the tag of the VLAN the "base tag". The port tag is used to determine the eligibility of the frames allowed to be part of the VLAN. Once the frame is admitted to the VLAN port, the base tag is used. From a functional standpoint, the frame tag is rewritten to the base tag.

ExtremeXOS 31.2 adds support for Virtual Extensible LAN (VXLAN) adding and deleting PSTag ports for Tenant VLANs.

Supported Platforms

ExtremeSwitching X670-G2, X465, X870, X690, X590, X695, and 5520 series switches.

Port-Specific Tag (PSTag) Support on ExtremeSwitching X695 and 5520 Series Switches

The port-specific (PSTag) VLAN tag allows tagged VLAN ports to be configured with tag values. When the tag is not configured, it is implicit that the tag of the tagged port is the tag of the VLAN. We call the tag of the port the "port tag", and the tag of the VLAN the "base tag". The port tag is used to determine the eligibility of the frames allowed to be part of the VLAN. After the frame is admitted to the VLAN port, the base tag is used. From a functional standpoint, the frame tag is rewritten to the base tag.

ExtremeXOS 31.2 adds PSTag support to the ExtremeSwitching X695 and 5520 series switches.

Supported Platforms

ExtremeSwitching X460-G2, X670-G2, X465, X870, X690, X590, X695, and 5520 series switches.

Network Time Protocol (NTP) Support on ExtremeSwitching X435 Series Switches

Network Time Protocol (NTP) provides a coordinated Universal Time Clock (UTC), the primary time standard by which the world regulates clocks and time. UTC is used by devices that rely on having a highly accurate, universally accepted time, and can synchronize computer clock times to a fraction of a millisecond. In a networked environment, having a universal time can be crucial. For example, the stock exchange and air traffic control use NTP to ensure accurate, timely data.

ExtremeXOS 31.2 adds NTP support for ExtremeSwitching X435 series switches.

Supported Platforms

ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, and 5520 series switches.

Link Layer Discovery Protocol (LLDP) Supported on Management Port

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

ExtremeXOS 31.2 introduces support for LLDP on the switch management port.

Supported Platforms

ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, and 5520 series switches.

Limitations

Standard TLVs are supported. No support is provided for vendor-specific and MED TLVs.

Support for Automated Continuous Output for Show Commands

This feature runs the integrated Python script `watch.py` to run a specified show command periodically and display the output accordingly. In the script, CLI paging is disabled so that user input is not needed, and CLI refreshing is disabled so that the keyword “no-refresh” is not needed in auto-refreshing commands.

Supported Platforms

ExtremeSwitching X435, X440-G2, X450-G2, X460-G2, X465, X590, X620, X670-G2, X690, X695, X870, 5520 series switches.

New CLI Command

`watch` *`command`* {**`difference`**} {**`count`** *`count`*} {**`interval`** *`interval`*}

Optimized VXLAN Replication using Underlay Multicast

ExtremeXOS 31.2 provides support for Virtual Extensible Local Area Network (VXLAN) underlay multicast (multicast tunnel). This feature provides support for the following:

- Dynamic virtual networks.
- BUD node operation (a VTEP acting as both transit and tunnel terminating node).
- MLAG.
- OSPF/BGP underlay and EVPN.
- Ability to configure VXLAN multicast tunnels in existing VXLAN deployments.
- Spine node can be a non-VTEP in leaf-spine topologies.
- Bandwidth preservation through optimized replication.

- Flexible choice of Multicast Distribution Tree (MDT).
- Option for automatic group address assignment for each VNI.

Supported Platforms

ExtremeSwitching X670-G2, X870, X690, X590, X695, X465 series switches.

Limitations

This feature has the following limitations:

- Supported only for overlay BUM traffic.
- Supported only with PIM-SSM.
- BUD node operation is not supported with MLAG.
- Multicast group range used for this feature cannot be configured/used for regular multicast traffic.

Note
This feature should not be used with Assisted Replication.

ExtremeSwitching 5520 Series Switches Trial License

The ExtremeSwitching 5520 series switches now have a renewable trial license.

New ExtremeSwitching 5520 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 was restricted to 30 days, and if after 30 days you did not obtain and installed a Premier license, and if you rebooted the switch, the switch will effectively have only Base license capabilities.

This enhancements allows you to extended the evaluation period by three more 30-day periods using a CLI command (see below).

Supported Platforms

ExtremeSwitching 5520 series switches.

Changed CLI Commands

The following commands now work on the ExtremeSwitching 5520 series switches.

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

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

Fabric Attach Support for Single-Homed W-MLAG

From ExtremeXOS 31.2, W-MLAG and single-homed MLAG support is provided for Fabric Attach. Before ExtremeXOS 31.1, the mappings from MLAG clients were checkpointed to the proxy or server peer. But starting with ExtremeXOS 31.2, the mappings from non-MLAG clients are also checkpointed to the MLAG proxy or server peer node. If the proxy or server is part of a W-MLAG network, then the mapppings from all the clients, irrespective of whether they are part of MLAG or not, are passed to all the peer nodes of the MLAG.

Supported Platforms

ExtremeSwitching X435, X450-G2, X460-G2, X670-G2, X440-G2, X465, X590, X620, X690, X695, X870, 5520 series switches.

ExtremeCloud™ IQ Agent Support

ExtremeXOS 31.2 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 6: Supported Platforms

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

ExtremeXOS 31.2 is compatible with specific versions of Extreme Management Center. Navigate to the following site and select your version of XMC for more information: 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 31.2 User Guide*.

Tested Third-Party Products

The following third-party products have been tested for ExtremeXOS 31.2.

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

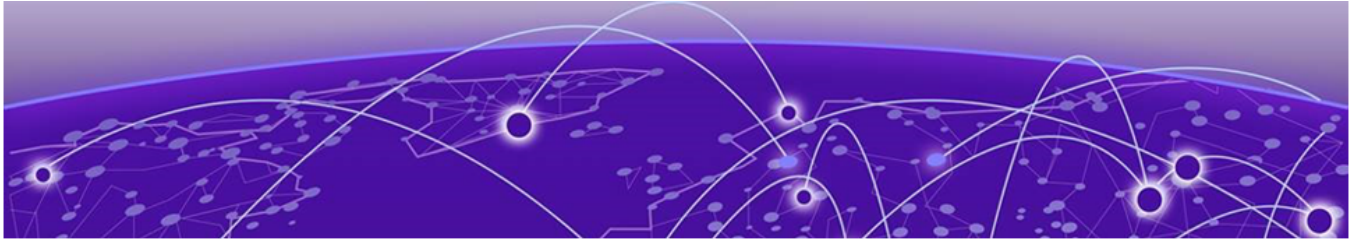
Tools used to assess ICMP attack vulnerability:

- SSPing
- Twinge
- Nuke
- WinFreeze

Port Scan Assessment

Tools used to assess port scan assessment:

- Nessus



Limits

This chapter summarizes the supported limits in ExtremeXOS 31.2.

Limits Overview

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

- Value Edge License Limits on page 31
- Edge License Limits on page 43
- Advanced Edge and Base License Limits on page 72
- Core and Premier License Limits on page 78

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

Switch Category	Switches	Applicable License Levels
Legacy 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	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.

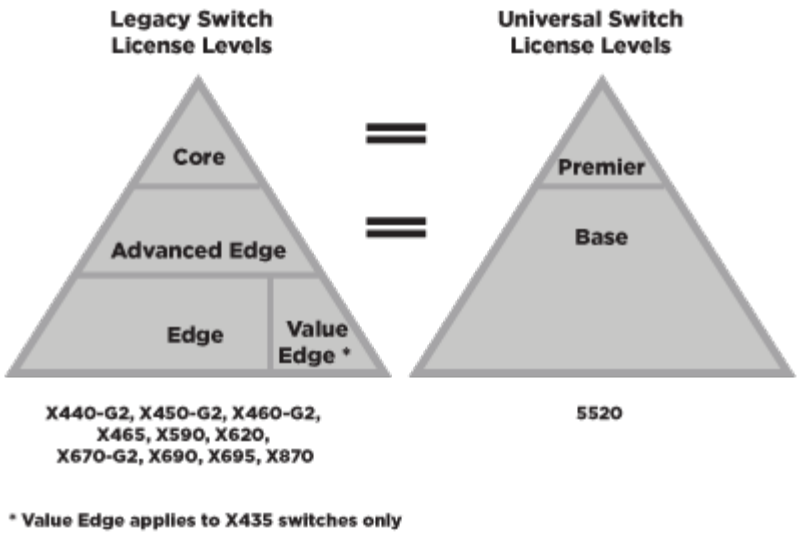


Figure 1: License Levels for Legacy and Universal Switches

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

Premier = Core

Base = Advanced Edge + AVB

For more information about licenses, see *ExtremeXOS 31.2 Feature License Requirements*.

The following tables summarize tested metrics for a variety of features, as measured in a per-system basis unless otherwise noted. These limits may change, but represent the current status. The contents of this table supersede any values mentioned in the 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 7: 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

Table 7: Supported Limits for Value Edge License (continued)

Metric	Product	Limit
CFM—maximum number of CFM down end points.	ExtremeSwitching X435	32
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 7: 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 7: 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 7: 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 7: 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. • The internal lookup table configuration used is "more l3-and-ipmc". • 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. • The internal lookup table configuration used is "more l3-and-ipmc". • Assumes source-group-vlan mode as lookup key.	ExtremeSwitching X435	700

Table 7: 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 7: 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 7: 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 7: 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 7: 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 7: 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 8: 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 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 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 5520	N/A
Access lists (policies)—maximum number of rules in a single policy file.[a]	ExtremeSwitching X460-G2, X450-G2, X670-G2	4,096 ingress 1,024 egress
	ExtremeSwitching X620, X440-G2	2,048 ingress 512 egress
	ExtremeSwitching X870	3,072 ingress 1,024 egress
	ExtremeSwitching X690, X590, X465, X695	8,192 ingress 1,024 egress
	ExtremeSwitching 5520	9,216 ingress 1,024 egress
Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP).	ExtremeSwitching X450-G2, X460-G2ExtremeSwitching, X590, X465, 5520	2,048 ingress only
	ExtremeSwitching X670-G2, X870, X690, X695	1,024 ingress only
	ExtremeSwitching X620, X440-G2	512 ingress only

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

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

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

Table 8: 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, X440-G2, X620, X870, X690, X590, X465, X695 ExtremeSwitching 5520	4 64
EAPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2 ExtremeSwitching X870, X690, X590, X465, X695, 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, X620, X440-G2, X870, X690, X590, X465, X695 ExtremeSwitching 5520	4 See Advanced Edge and Base License Limits on page 72
ERPSv1 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X870, X690, X590, X465, X695, 5520 ExtremeSwitching X450-G2, X460-G2, X670-G2, 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, 5520 ExtremeSwitchingX620, X440-G2	2,000 500
ELSM (vlan-ports)—maximum number of VLAN ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590 , X465, X695, 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
Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs).	ExtremeSwitching X465, X590, X670-G2, X690, 5520	2 on V400-24 and V300 models 4 on V400-48 models

Table 8: 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, 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
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
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X690, X590, X465, X695, 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 X440-G2	9,000 pps
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	ExtremeSwitching X460-G2	49,152[f]
	ExtremeSwitching X670-G2	294,912[f]
	ExtremeSwitching X450-G2	34,816[f]
	ExtremeSwitching X620, X440-G2	16,384[f]
	ExtremeSwitching X870	139,264[f]
	ExtremeSwitching X690, X590, X465	278,528[f]
	ExtremeSwitching X695	294,912 [f]
	ExtremeSwitching 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 X670-G2, X870, X690, X590, X465, X695, 5520	4,096

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
FDB (maximum L2 entries)—maximum number of MAC addresses.	ExtremeSwitching X460-G2	98,300 g
	ExtremeSwitching 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 5520	114,688 g
FDB (maximum L2 entries)—maximum number of multicast FDB entries.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2	1,024
Identity management—maximum number of Blacklist entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	512
Identity management—maximum number of Whitelist entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	512
Identity management—maximum number of roles that can be created.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	64
Identity management—maximum role hierarchy depth allowed.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	5
Identity management—maximum number of attribute value pairs in a role match criteria.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	16
Identity management—maximum number of child roles for a role.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8
Identity management—maximum number of LDAP servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8
Identity management—maximum number of Kerberos servers that can be configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	20
Identity management—maximum database memory size.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	512

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
Identity management—recommended number of identities per switch. Note: Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	100
Identity management—recommended number of ACL entries per identity. Note: Number of ACLs per identity, based on system ACL limitation.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	20
Identity management—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	ExtremeSwitching X460-G2, X870	1,500
	ExtremeSwitching X450-G2	2,048
	ExtremeSwitching X670-G2 , X695	2,000
	ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X690, X590, X465	4,000
	ExtremeSwitching 5520	2,500
IGMPv1/v2 SSM-map entries—maximum number of IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	500
IGMPv1/v2 SSM-map entries—maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	50
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	ExtremeSwitching X870, X690, X590, X465, X695 , X670-G2, X460-G2, X450-G2, 5520	4,000
	ExtremeSwitching X440-G2, X620	3,500
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X460-G2, X450-G2, 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, 5520	250

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	ExtremeSwitching X670-G2, X460-G2, X450-G2, 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 , 5520	20,000
	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690, X590, X465, X695	45,000
IP ARP entries in software—maximum number of IP ARP entries in software. Note: Might be limited by hardware capacity of FDB (maximum L2 entries).	ExtremeSwitching X670-G2	131,072 (up to)[h]
	ExtremeSwitching X460-G2	57,344 (up to)[h]
	ExtremeSwitching X450-G2	47,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	20,480
	ExtremeSwitching X870	94,206 (up to)[h]
	ExtremeSwitching X690, X590, X465	157,694 (up to)[h]
	ExtremeSwitching X695	184,318 (up to)[h]
	ExtremeSwitching 5520	74,750 (up to)[h]
IPv4 ARP entries in hardware with minimum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. Assumes number of IP route reserved entries is 100 or less.	ExtremeSwitching X870	74,000 (up to)[h]
	ExtremeSwitching X460-G2	50,000 (up to)[h]
	ExtremeSwitching X670-G2	108,000 (up to)[h]
	ExtremeSwitching X450-G2	39,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690, X590, X465	119,000 (up to)[h]
	ExtremeSwitching X695	146,000 (up to)[h]
	ExtremeSwitching 5520	60,000[h]

Table 8: 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 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 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, X620, X440-G2, X870, X690, X590, X465, X695, 5520	N/A
IPv4 remote hosts in hardware with zero LPM routes—maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less.	ExtremeSwitching X870	120,000 (up to)[h]
	ExtremeSwitching X460-G2	73,000[h]
	ExtremeSwitching X670-G2	176,000 (up to)[h]
	ExtremeSwitching X450-G2	61,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X690, X590, X465	216,000 (up to)[h]
	ExtremeSwitching X695	241,000 (up to)[h]
	ExtremeSwitching 5520	102,000[h]
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	ExtremeSwitching X460-G2, X450-G2, X440-G2, X620	25,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	131,000
	ExtremeSwitching 5520	81,000

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	ExtremeSwitching X460-G2	12,000
	ExtremeSwitching X450-G2	16,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	131,000 [q]
	ExtremeSwitching X620, X440-G2	480
	ExtremeSwitching 5520	81,000 [q]
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	255
	ExtremeSwitching X440-G2, X620	N/A
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	1 (per virtual router)
	ExtremeSwitching X440-G2, X620	N/A
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	255
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	2,048
	ExtremeSwitching X620, X440-G2	510
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	ExtremeSwitching X670-G2	36,750 [h]
	ExtremeSwitching X460-G2, X870	22,000 [h]
	ExtremeSwitching X450-G2	12,000 [h]
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X690, X590, X465	24,500 [s]
	ExtremeSwitching 5520	18,000 [s]
	ExtremeSwitching X695	57,000 [h]
IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	ExtremeSwitching X450-G2, X460-G2, X620, X440-G2	25,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	65,000 [q]
	ExtremeSwitching 5520	18,000 [q]
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	ExtremeSwitching X460-G2	6,000
	ExtremeSwitching X450-G2	8,000
	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	65,000 [q]
	ExtremeSwitching X620, X440-G2	240
	ExtremeSwitching 5520	40,000 [q]

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv6 routes with a mask greater than 64 bits in hardware—maximum number of such IPv6 LPM routes in hardware.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5520	8,192[r]
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X450-G2, X460-G2	2,048
IPv6 route sharing in hardware—route mask lengths for which ECMP is supported in hardware.	ExtremeSwitching X460-G2, X450-G2, X620, 5520	0–64 >64 single path only
	ExtremeSwitching X670-G2, 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, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520	2,048
	ExtremeSwitching X620, X440-G2	510
IP multicast static routes—maximum number of permanent multicast IP routes.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520	1,024
IP unicast static routes—maximum number of permanent IP unicast routes.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X620, X440-G2	480
IP route sharing (maximum gateways)—Configurable maximum number of gateways used by equal cost multipath OSPF, BGP, IS-IS, static routes, or L2VPNs. Static routes, OSPF, and BGP are limited to 64 ECMP gateways per destination, while IS-IS is limited to 8. L2VPNs are limited to 16 LSPs per pseudowire on platforms that support 32 gateways, and 64 LSPs per pseudowire on platforms that support 64 gateways.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X620, X870, X690, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching 5520	2, 4, or 8
	ExtremeSwitching X440-G2	N/A

Table 8: 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	
	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 31.2 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 8: 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 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 31.2 User Guide*.	510
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	255
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	9,216
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch—maximum number of VCCV enabled VPLS VPNs.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	16 N/A
L2 VPN: VPLS MAC addresses—maximum number of MAC addresses learned by a switch.	ExtremeSwitching X670-G2, X690, X590, X465 ExtremeSwitching X460-G2 ExtremeSwitching X870 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	140,000 55,000 65,000 N/A
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	1,023 N/A
L2 VPN: VPLS peers—maximum number of VPLS peers per VPLS instance.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	64 N/A
L2 VPN: LDP pseudowires—maximum number of pseudowires per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465 ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	7,000 N/A

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
L2 VPN: static pseudowires—maximum number of static pseudowires per switch.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465	7,000
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	N/A
L2 VPN: Virtual Private Wire Service (VPWS) VPNs—maximum number of virtual private networks per switch.	ExtremeSwitching X670-G2, X870, X690, X590, X465	4,090
	ExtremeSwitching X460-G2	1,023
	ExtremeSwitching X450-G2, X620, X440-G2, X695, 5520	N/A
Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. Note: • The internal lookup table configuration used is "l2-and-l3". • IPv6 and IPv4 L2 IPMC scaling is the same for this mode. • Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are the same.	ExtremeSwitching X670-G2, X695	73,000
	ExtremeSwitching X460-G2	24,000
	ExtremeSwitching X450-G2	14,000
	ExtremeSwitching X620, X440-G2	5,000
	ExtremeSwitching X870	36,000
	ExtremeSwitching X690, X590, X465	67,000
	ExtremeSwitching 5520	32,768
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. • The internal lookup table configuration used is "more l3-and-ipmc". • Assumes source-group-vlan mode as look up key. • Layer 3 IPMC cache limit in mixed mode also has the same value.	ExtremeSwitching X460-G2	26,000
	ExtremeSwitching X450-G2	21,000
	ExtremeSwitching X670-G2	77,500
	ExtremeSwitching X620, X440-G2	1,500
	ExtremeSwitching X870	52,000
	ExtremeSwitching X690, X590, X465	93,000
	ExtremeSwitching X695	104,000
	ExtremeSwitching 5520	43,000

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
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. • The internal lookup table configuration used is "more l3-and-ipmc". • Assumes source-group-vlan mode as lookup key.	ExtremeSwitching X670-G2	30,000
	ExtremeSwitching X460-G2	14,000
	ExtremeSwitching X450-G2	10,000
	ExtremeSwitching X620, X440-G2	700
	ExtremeSwitching X870	18,000
	ExtremeSwitching X690, X590, X465	48,000
	ExtremeSwitching X695	52,000
	ExtremeSwitching 5520	21,500
Load sharing—maximum number of load sharing groups. Note: The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	128
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2	8
	For standalone: ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	32
	For stacked: ExtremeSwitching X670-G2, X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695, 5520	64
Logged messages—maximum number of messages logged locally on the system.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	20,000
MAC-based security—maximum number of MAC-based security policies.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	ExtremeSwitching X460-G2, X450-G2, X670-G2, X440-G2, X620, X870, X690, X590 , X465, X695, 5520	2,048

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
Maximum mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 Note: Only two or four mirroring instances will be active at a time, depending on the mirroring filter added to it. There are four hardware resource slots. Each single instance uses one such slot, while each ingress plus egress instance uses two slots. You can use a total of four slots, while there are no more than two egress instances. The maximum possible combination for mirroring instances: 1. 4 ingress 2. 3 ingress + 1 egress 3. 2 ingress + 2 egress 4. 2 (ingress + egress) 5. 1 (ingress + egress) + 2 ingress 6. 1 (ingress + egress) + 1 egress + 1 ingress	16 (including default mirroring instance)
	ExtremeSwitching X620, X440-G2 Note: For stacks containing X620 or X440-G2, maximum supported egress mirror instances is 1.	1 (egress)
	ExtremeSwitching 5520	4 total, 2 egress
Mirroring (filters)—maximum number of mirroring filters. Note: This is the number of filters across all the active mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	128
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. Note: This is the number of filters across all the active mirroring instances.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	16

Table 8: Supported Limits for Edge License (continued)

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

Table 8: Supported Limits for Edge License (continued)

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

Table 8: Supported Limits for Edge License (continued)

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

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 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, 5520	1,024
	ExtremeSwitching X670-G2, X870, X690, X695	512
	ExtremeSwitching X620, X440-G2	256
Network Login—maximum number of dynamic VLANs.	ExtremeSwitching X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695	2,000
	ExtremeSwitching X440-G2, X620, 5520	1,024
Network Login VLAN VSAs—maximum number of VLANs a client can be authenticated on at any given time.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	10
Network Service Identifiers (NSI)/ VLAN mappings—maximum number of VLANs to NSI mappings.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 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
Node Alias—maximum number of entries per slot.	ExtremeSwitching X450-G2, X460-G2, X670-G2 X620, X440-G2, X870, X690, X590, X465, X695, 5520	8,192
ONEPolicy Roles/Profiles—maximum number of policy roles/ profiles.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	63

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Rules per Role/Profile—maximum number of rules per role/policy.	ExtremeSwitching X450-G2, X460-G2	IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256
	ExtremeSwitching X670-G2, X870	IPv6 Rules: 256 L2 Rules: 184 MAC Rules: 256 IPv4 Rules: 256
	ExtremeSwitching X620, X440-G2	IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch)
	ExtremeSwitching X465, X690, X590, X695	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440
	ExtremeSwitching 5520	4,024
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465, 5520	1,024
	ExtremeSwitching X670-G2, X690, X870, X695	512
	ExtremeSwitching X620, X440-G2	256
	Stacking	Depends on the stack nodes, but the maximum is 65,535.
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch with TCI-Overwrite disabled. Note: The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X690, X590, X465	24,576
	ExtremeSwitching X670-G2, X460-G2, X870, X695	12,288
	ExtremeSwitching X450-G2	6,144
	ExtremeSwitching X620, X440-G2	1,536
	Stacking	1,536–65,534
	ExtremeSwitching 5520	9,216

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port per switch with TCI overwrite disabled. Note: The maximum values assume 75% utilization of VLAN-XLATE hash table.	ExtremeSwitching X450-G2	6,144
	ExtremeSwitching X460-G2, X670-G2, X870, X695	12,288
	ExtremeSwitching X690, X590, X465	24,576
	ExtremeSwitching X440-G2, X620	1,536
	ExtremeSwitching 5520	9,216
ONEPolicy Authenticated Users per Port per Switch— maximum number of authenticated users per port with only with TCI-Overwrite enabled.	ExtremeSwitching X450-G2, X460-G2, X590, X465, 5520	1,024
	ExtremeSwitching X670-G2, X870, X690, X695	512
	ExtremeSwitching X620, X440-G2	256
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X690, X590, X465, X695	1,976
	ExtremeSwitching 5520	4,024
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590, X465, X695	512
	ExtremeSwitching 5520	1,024
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590, X465, X695	512
	ExtremeSwitching 5520	1,024
ONEPolicy Permit/Deny Traffic Classification Rules Types— maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870	256
	ExtremeSwitching X690, X590, X465, X695	512
	ExtremeSwitching 5520	1,024

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X690, X590, X465, X695	440
	ExtremeSwitching 5520	952
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5520	256 [O]
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5520	32 [O]
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	ExtremeSwitching X670-G2	63
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X690, X695	71
	ExtremeSwitching X590, X465	31
	ExtremeSwitching 5520	36
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. Note: This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695	1,024
	ExtremeSwitching X450-G2	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
	ExtremeSwitching 5520	960
Private VLANs—maximum number of private VLANs in an L2-only environment.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695	1,280
	ExtremeSwitching X450-G2	597
	ExtremeSwitching X440-G2, X620	255
	ExtremeSwitching 5520	960

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
PTP/1588v2 Clock Ports	ExtremeSwitching X460-G2, X670-G2	31 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695, 5520	N/A
PTP/1588v2 Clock Instances	ExtremeSwitching X670-G2, X460-G2	2 combinations: • Transparent clock + ordinary clock • Transparent clock + boundary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590 , X695, 5520	N/A
PTP/1588v2 Unicast Static Slaves	ExtremeSwitching X670-G2, X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590 , X695, 5520	N/A
PTP/1588v2 Unicast Static Masters	ExtremeSwitching X670-G2, X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695 , 5520	N/A
Route policies—suggested maximum number of lines in a route policy file.	ExtremeSwitching X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	ExtremeSwitching X670-G2, X460-G2, X440-G2, X620, X870, X690, X590 , X465 , X695, 5520	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590 , X465, X695, 5520	256
	ExtremeSwitching X440-G2, X620	128
RIPng learned routes—maximum number of RIPng routes.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590 , X465, X695, 5520	3,000
	ExtremeSwitching X440-G2, X620	N/A
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X620, X870, X690, X590 , X465, X695, 5520	64
	ExtremeSwitching X440-G2	32

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
Spanning Tree PVST+—maximum number of port mode PVST domains. Note: For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, ExtremeSwitching X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	ExtremeSwitching X670-G2, X620	256
	ExtremeSwitching X460-G2, X450-G2, X440-G2, 5520	128
	ExtremeSwitching X870, X690, X590 , X465, X695	384
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590 , X465, X695, 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 X670-G2	500
	ExtremeSwitching X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695, 5520	600
	ExtremeSwitching X440-G2	256
Spanning Tree—maximum number of VLANs on all MSTP instances.	ExtremeSwitching X670-G2, X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695, 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, X620, X440-G2, X870, X690, X590 , X465, X695, 5520	1
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590, X465, X695, 5520	4,096
	ExtremeSwitching X440-G2	2,048
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	ExtremeSwitching X670-G2, X460-G2, X450-G2, X620, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X440-G2	600
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	1,024

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	16
Syslog targets—maximum number of configurable Syslog targets.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590 , X465, X695, 5520 ExtremeSwitching X440-G2, X620	63 16 (local-only VRs)
Virtual router forwarding (VRFs)—maximum number of VRFs that can be created on a switch. Note: * Subject to other system limitations.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590 , X465, X695, 5520 ExtremeSwitching X440-G2, X620	960 * 16 (local-only VRFs)
Virtual router protocols per VR—maximum number of routing protocols per VR.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520 ExtremeSwitching X440-G2, X620	8 N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520 ExtremeSwitching X440-G2, X620	64 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, X620, X440-G2, X870, X690, X590, X465, X695, 5520	1,000
VLANs—includes all VLANs. Note: ExtremeXOS supports only 4,092 user-configurable VLANs. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5520	4,094
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695, 5520	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520 ExtremeSwitching X440-G2, X620	2,048 510

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces.	ExtremeSwitching X440-G2, X450-G2, X460-G2, X465, X590, X670-G2, X620, X690, X870, X695, 5520	131,585
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with the default license.	ExtremeSwitching X670-G2, X870, X690, X590 , X465, X695, 5520	32
	ExtremeSwitching X440-G2	28
	ExtremeSwitching X460-G2	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, X620, X440-G2. X870, X690, X590 , X465, X695, 5520	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	ExtremeSwitching X670-G2	63
	ExtremeSwitching X460-G2	53
	ExtremeSwitching X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X870	127
	ExtremeSwitching X690, X695	71
	ExtremeSwitching X590, X465	31
	ExtremeSwitching 5520	36
VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN. Note: This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports.	ExtremeSwitching X670-G2, X465, X870, X690, X590, X695	1,024
	ExtremeSwitching X450-G2	512
	ExtremeSwitching X620	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching 5520	960
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695	2,046
	ExtremeSwitching X440-G2, X620	255
	ExtremeSwitching 5520	960

Table 8: Supported Limits for Edge License (continued)

Metric	Product	Limit
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 5520	9,000
XML requests—maximum number of XML requests per second. Note: Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695, 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, X870, X690, X590, X465, X695, 5520	2,048
	ExtremeSwitching X450-G2, X440-G2, X620	1,024
XNV database entries—maximum number of VM database entries (combination of local and network VMs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	16,000
XNV database entries—maximum number of VPP database entries (combination of local and network VPPs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	2,048
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs /local VMs).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	2,048
XNV local VPPs—maximum number of XNV local VPPs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	2,048 ingress 512 egress
XNV policies/dynamic ACLs—maximum number of policies/ dynamic ACLs that can be configured per VPP.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs.[p]	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 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 9: 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, X690, X870, X590, X465, X695, 5520	64
BGP auto-peering attached IPv4 hosts— maximum number of attached IPv4 hosts.	ExtremeSwitching X670-G2	16,000
	ExtremeSwitching X870, X690, X590, X465, X695, 5520	64,000
BGP auto-peering attached IPv6 hosts— maximum number of attached IPv6 hosts.	ExtremeSwitching X670-G2	254
	ExtremeSwitching X870, X690, X590, X465, X695, 5520	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, ExtremeSwitching X690, X870, X590, X465, X695, 5520	16*
	ExtremeSwitching 5520	4*
BGP auto-peering maximum IPv4 prefixes with ECMP—Maximum number of IPv4 Network prefixes with ECMP.	ExtremeSwitching X670-G2, ExtremeSwitching X690, X870, X590, X465, X695	64,000
	ExtremeSwitching 5520	16,000
BGP auto-peering maximum IPv6 prefixes with ECMP—Maximum number of IPv6 Network prefixes with ECMP.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695	8,000
	ExtremeSwitching 5520	254
BGP auto-peering MLAG peers—maximum MLAG peers per AutoBGP node.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5520	1
BGP auto-peering VRFs—maximum number of VRFs.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 5520	64
BGP auto-peering EVPN instances—maximum EVPN instances.	ExtremeSwitching X670-G2, X690, X870, X590, X465, X695, 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, 5520	64
	ExtremeSwitching X440-G2, X620	32

Table 9: Supported Limits for Advanced Edge and Base License (continued)

Metric	Product	Limit
EAPSv2 protected VLANs—maximum number of protected VLANs.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X440-G2, X620, 5520	500
	ExtremeSwitching X870, X690, X590, X465, X695	2,000
ERPS domains—maximum number of ERPS domains without CFM configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	32
ERPS domains—maximum number of ERPS domains with CFM configured.	ExtremeSwitching X450-G2, X670-G2, X620, X870, X690, X590, X465, X695, 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, 5520	2,000
	ExtremeSwitching 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, 5520	2,000
	ExtremeSwitching X620, X440-G2	500
ESRP groups—maximum number of ESRP groups	ExtremeSwitching X450-G2, X460-G2, X670-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5520	32
ESRP domains—maximum number of ESRP domains.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	511
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 5520	1
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695	64
	ExtremeSwitching X620	4
	ExtremeSwitching 5520	8
	ExtremeSwitching X440-G2	N/A

Table 9: Supported Limits for Advanced Edge and Base License (continued)

Metric	Product	Limit
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	8
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X670-G2, X460-G2, 5520	5,000
	ExtremeSwitching 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, 5520	2,000
	ExtremeSwitching X450-G2, X440-G2, X620	1,000
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695, 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 X450-G2, X620, X440-G2	4
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X440-G2, X620, X870, X690, X590, X465, X695, 5520	4
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X670-G2, X460-G2, 5520	50
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	32
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X460-G2, X670-G2, 5520	16
	ExtremeSwitching X450-G2, X440-G2, X620	4
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching 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 X670-G2, X460-G2, 5520	3,000
	ExtremeSwitching X450-G2, X440-G2, X620	500

Table 9: Supported Limits for Advanced Edge and Base License (continued)

Metric	Product	Limit
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X440-G2, X620, X590, X465, X695, 5520	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X440-G2, X620, X590, X465, X695, 5520	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
	ExtremeSwitching X450-G2, X440-G2, X620	4
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X440-G2, X620, X690, X590, X465, X695, 5520	4
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590 , X465, X695, 5520	5,000
	ExtremeSwitching X440-G2, X620	1,500
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5520	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5520	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X440-G2, X620, X690, X590 , X465, X695, 5520	4
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465, X695, 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, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	3,000 (depends on policy file limits)

Table 9: Supported Limits for Advanced Edge and Base License (continued)

Metric	Product	Limit
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695, 5520	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5520	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695, 5520	32
Port-specific VLAN tags—maximum number of port-specific VLAN tags.	ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590 , X465, 5520, X695	1,023
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
Port-specific VLAN tags—maximum number of port-specific VLAN tag ports.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, 5520, X695	4,000
	ExtremeSwitching X450-G2, X440-G2, X620	N/A
VRRP (v2/v3-IPv4) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs):	
	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	2,048
	ExtremeSwitching X440-G2, X620	128
	Sliced Mode:	
	ExtremeSwitching 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 X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695, 5520	2,048
	ExtremeSwitching X440-G2, X620	128

Table 9: Supported Limits for Advanced Edge and Base License (continued)

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

Table 9: Supported Limits for Advanced Edge and Base License (continued)

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

Core and Premier License Limits

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

Table 10: Supported Limits for Core and Premier License

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

Table 10: 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, X870, 5520	128
	ExtremeSwitching , X590, X465, X695	300
	ExtremeSwitching X450-G2	100
	ExtremeSwitching X690	500
BGP (peer groups)—maximum number of BGP peer groups.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching X450-G2	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	1,024
	ExtremeSwitching X450-G2	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2	20,000
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465 , X695, 5520 (at default)	25,000
	ExtremeSwitching X870, X690, X590 , X465 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2	20,000
	ExtremeSwitching 5520 (with ALPM enabled)	80,000
BGP (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2	20,000
BGP ECMP—maximum number of equal cost paths per multipath for BGP and BGPv6.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X450-G2	64
	ExtremeSwitching 5520	8

Table 10: 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, 5520	6,000
	ExtremeSwitching X670-G2	8,000
	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
	ExtremeSwitching X450-G2	4,800
	ExtremeSwitching 5520 (with ALPM enabled)	40,000
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	ExtremeSwitching X460-G2, 5520	18,000
	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695	24,000
	ExtremeSwitching X450-G2	14,000
EVPN EVI instances—maximum number of EVI instances.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695, 5520	1,024
EVPN LAGs—maximum number of LAGs.	ExtremeSwitching X670-G2, X870, X690, X590, X465, X695	128
GRE Tunnels—maximum number of GRE tunnels.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465 , X695, 5520	255
	ExtremeSwitching X620, X440G2	N/A
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 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, X870, X690, X590, X465, X695, 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, 5520	255
	ExtremeSwitching X450-G2	N/A
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	256
	ExtremeSwitching X450-G2	N/A
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2	N/A

Table 10: 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, X870, X690, X590, X465, X695, 5520	25,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 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, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 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, X870, X690, X590, X465, X695, 5520	20,000
	ExtremeSwitching X450-G2	N/A
IS-IS IPv4/IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a Level 1/Level2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	20,000
	ExtremeSwitching X450-G2	N/A
MSDP active peers—maximum number of active MSDP peers.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	64
MSDP SA cache entries—maximum number of entries in SA cache.	ExtremeSwitching X670-G2, X690, X590, X465, X695, 5520	14,000
	ExtremeSwitching X460-G2	10,000
	ExtremeSwitching X870	11,000
	ExtremeSwitching X450-G2	8,000

Table 10: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching 5520	8
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465, X695	10,000
	ExtremeSwitching X670-G2, X460-G2, 5520	5,000
	ExtremeSwitching X450-G2	4,000
OSPFv2 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590, X465, X695	4,000
	ExtremeSwitching X670-G2, X460-G2, 5520	2,000
	ExtremeSwitching X450-G2	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching X450-G2	320
OSPFv2 links—maximum number of links in the router LSA.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	400
	ExtremeSwitching X450-G2	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	128
	ExtremeSwitching X450-G2	96
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X670-G2, X460-G2 , 5520	50
	ExtremeSwitching X450-G2	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	32
	ExtremeSwitching X450-G2	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465, X695	100
	ExtremeSwitching X460-G2, X670-G2, 5520	16
	ExtremeSwitching X450-G2	12

Table 10: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
OSPFv3 external routes—recommended maximum number of external routes.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	10,000
	ExtremeSwitching X450-G2	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590, X465, X695	4.000
	ExtremeSwitching X670-G2, X460-G2, 5520	3,000
	ExtremeSwitching X450-G2	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695	256
	ExtremeSwitching X450-G2	192
	ExtremeSwitching 5520	4
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	64
	ExtremeSwitching X450-G2	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695, 5520	16
	ExtremeSwitching X450-G2	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	255
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	145
PIM IPv4 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	255

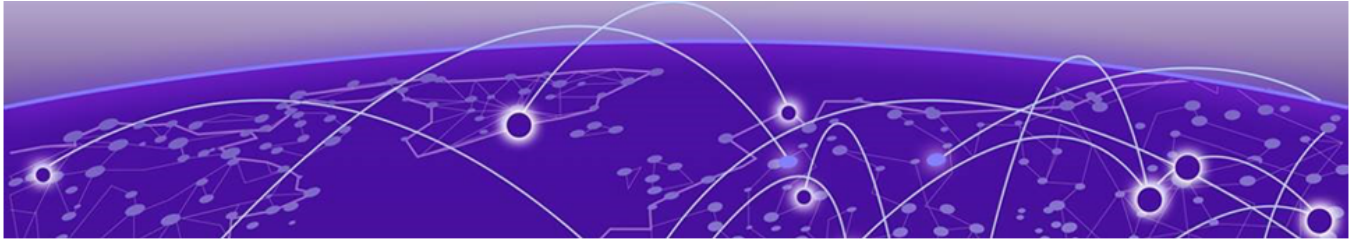
Table 10: Supported Limits for Core and Premier License (continued)

Metric	Product	Limit
PIM IPv6 Limits—maximum number of multicast sources per group.	ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465, X695 , 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, X870, X690, X590 , X465, X695, 5520	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695, 5520	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	64
PIM IPv6 Limits—maximum number of secondary addresses per interface.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 5520	70
PIM IPv6 Limits—static rendezvous points.	ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695, 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 31.2.

Table 11: Open Issues, Platform-Specific, and Feature Change Requests (CRs)

Defect Number	Description
Fabric Attach	
EXOS-28354	Fabric Attach assignments learned from netlogin FA clients are not checkpointed to the MLAG peer switch.

Known Behaviors

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

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

Defect Number	Description
General	
EXOS-27922	Beginning with EXOS 31.2, PTPv2 is not supported on X460-G2 and X670-G2 switches.

Resolved Issues in ExtremeXOS 31.2

The following issues were resolved in ExtremeXOS 31.2. ExtremeXOS 31.2 includes all fixes up to and including ExtremeXOS 11.6.5.3, and earlier, ExtremeXOS 12.0.5, ExtremeXOS 12.1.7, ExtremeXOS 12.2.2-patch1-12, ExtremeXOS 12.3.6, ExtremeXOS 12.4.5, ExtremeXOS 12.5.5, ExtremeXOS 12.6.3, ExtremeXOS 12.6.5, ExtremeXOS 12.7.1, ExtremeXOS 15.1.5, ExtremeXOS 15.2.4, ExtremeXOS 15.3.3, ExtremeXOS 15.4.1, ExtremeXOS 15.5.1, ExtremeXOS 15.5.2, ExtremeXOS 15.6.1, ExtremeXOS 15.6.2, ExtremeXOS 15.7.1,

ExtremeXOS 16.1, ExtremeXOS 16.1.2, ExtremeXOS 16.1.3, ExtremeXOS 21.1, ExtremeXOS 22.1, ExtremeXOS 22.2, ExtremeXOS 22.3, ExtremeXOS 22.4, ExtremeXOS 22.5, ExtremeXOS 22.6, ExtremeXOS 30.1, ExtremeXOS 30.2, ExtremeXOS 30.3, ExtremeXOS 30.4, ExtremeXOS 30.5, ExtremeXOS 30.6, ExtremeXOS 30.7, and ExtremeXOS 31.1. For information about those fixes, see the release notes for the specific release.

Table 13: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 31.2

Defect Number	Description
Fabric Attach	
EXOS-26121	Dynamic FAMgmt VLAN is not cleared on PROXY when it transitions to CLIENT.