



ExtremeXOS Release Notes

Software Version ExtremeXOS 30.4

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Preface

This section discusses the conventions used in this guide, ways to provide feedback, additional help, and other Extreme Networks® publications.

Conventions

This section discusses the conventions used in this guide.

Text Conventions

The following tables list text conventions that are used throughout this guide.

Table 1: Notice Icons





Icon	Notice Type	Alerts you to...
	General Notice	Helpful tips and notices for using the product.
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.
<i>New!</i>	New Content	Displayed next to new content. This is searchable text within the PDF.

Table 2: Text Conventions

Convention	Description
<code>Screen displays</code>	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.”

Table 2: Text Conventions (continued)

Convention	Description
[Key] names	Key names are written with brackets, such as [Return] 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]
<i>Words in italicized type</i>	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.

Platform-Dependent Conventions

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

- ExtremeSwitching® switches
- Summit® 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 to Us

Quality is our first concern at Extreme Networks, and we have 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 especially want to know about:

- Content errors or confusing or conflicting information.
- Ideas for improvements to our documentation so you can find the information you need faster.
- Broken links or usability issues.

If you would like to provide feedback to the Extreme Networks Information Development team, you can do so in two ways:

- Use our short online feedback form at <https://www.extremenetworks.com/documentation-feedback/>.
- Email us at documentation@extremenetworks.com.

Please 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.

The Hub

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

Call GTAC

For immediate support: 1-800-998-2408 (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 and/or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any action(s) 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

Subscribing to Service Notifications

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

1. Go to www.extremenetworks.com/support/service-notification-form.
2. Complete the form with your information (all fields are required).
3. Select the products for which you would like to receive notifications.



Note

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

4. Click **Submit**.

Related Publications

ExtremeXOS Publications

- *ACL Solutions Guide*
- *ExtremeXOS 30.4 Command Reference Guide*
- *ExtremeXOS 30.4 EMS Messages Catalog*
- *ExtremeXOS 30.4 Feature License Requirements*
- *ExtremeXOS 30.4 User Guide*
- *ExtremeXOS Quick Guide*
- *ExtremeXOS Legacy CLI Quick Reference Guide*
- *ExtremeXOS Release Notes*
- *Extreme Hardware/Software Compatibility and Recommendation Matrices*
- *Switch Configuration with Chalet for ExtremeXOS 21.x and Later*
- *Using AVB with Extreme Switches*

Extreme Management Center Publications

- *ISW-Series Managed Industrial Ethernet Switch Extreme Management Center User Guide*

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Overview

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These release notes document ExtremeXOS 30.4, which adds features and resolves software deficiencies.

Security Information

The following section covers important security information for ExtremeXOS 30.4.

OpenSSL Version

ExtremeXOS 30.4 uses FIPS fips-ecp-2.0.16.

Linux Kernel

ExtremeXOS 30.4 uses Linux Kernel 4.14.

Upgrading ExtremeXOS

For instructions about upgrading ExtremeXOS software, see "Software Upgrade and Boot Options" in the [ExtremeXOS 30.4 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 manually upgrade the switch:

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 may 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 `.1st` 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 30.4 User Guide](#).

After this one-time upgrade, you can perform all subsequent ExtremeXOS upgrades automatically using the `.1st` file. For more information about automatic upgrades, see the *Automatic Upgrading* section in the *Extended Edge Switching Chapter* in the [ExtremeXOS 30.4 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/*"
```

Default ExtremeXOS® Settings

Table 3 shows the default settings for ExtremeXOS starting with version 22.6, and shows any changes that have been made to these setting and in what version these changes were made.

Table 3: Default ExtremeXOS Settings

ExtremeXOS Feature	ExtremeXOS 22.6 Settings	ExtremeXOS 30.1 Settings	ExtremeXOS 30.3
Account Lockout	After 3 consecutive login failures, account is locked for 5 minutes. ^a		
AVB	Disabled.		
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. ^a		
DHCP	Disabled.		
DNS Cache Resolver and Analytics	N/A.	N/A.	Disabled.
IPFIX	Disabled.		
EAPS	Disabled.		

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

Table 3: Default ExtremeXOS Settings (continued)

ExtremeXOS Feature	ExtremeXOS 22.6 Settings	ExtremeXOS 30.1 Settings	ExtremeXOS 30.3
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.		
IGMP Snooping	Enabled.		
IP Route Compression	Enabled.		
ISIS	Disabled.		
Log	Admin level privileges required to show log. ^a		
Logging memory buffer	Generate an event when the logging memory buffer exceeds 90% of capacity. ^a		
MAC Security	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.		
OpenFlow	Disabled.		
OSPF	Disabled.		
OVSDB	Disabled.		
Passwords	Plain text password entry not allowed. ^a		
PIM	Disabled.		
PIM Snooping	Disabled.		

Table 3: Default ExtremeXOS Settings (continued)

ExtremeXOS Feature	ExtremeXOS 22.6 Settings	ExtremeXOS 30.1 Settings	ExtremeXOS 30.3
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.		
SNMP server	Disabled. ^a		
SSH	Disabled.		
Stacking	Disabled.		
Stacking auto-discovery	N/A.	N/A.	Enabled.
STP	Enabled.		
Syslog	Disabled.		
TACACS	Disabled.		
Telnet	Disabled. ^a		
VPLS	All newly created VPLS instances are enabled.		
Watchdog	Enabled.		
Web HTTP server	Disabled. ^a		

New and Corrected Features in ExtremeXOS 30.4

This section lists the new and corrected features supported in the 30.4 software:

Redundant Remote IP Address Mirroring

For high availability, each instance of a mirror to a remote IP address can have up to four remote IP addresses configured with a unique priority. For each mirror instance, the remote IP address with the highest priority value that is deemed “up” is used as the destination IP address for GRE-tunneled mirrored traffic. All other remote IP addresses deemed “up” for that mirror instance are on standby, ready to be used in the event the preferred remote IP address goes “down”. Each remote IP address is monitored independently with ping health check, route tracking, and gateway ARP tracking.

Supported Platforms

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

Limitations

All previous limitations for mirror to remote IP addresses still apply to this redundancy feature.

New CLI Commands

```
configure mirror {mirror_name to remote-ip delete [all |  
remote_ip_address {{vr} vr_name}}
```

Changed CLI Commands

Changes are underlined.

```
create mirror mirror_name {to [port port | port-list port_list loopback-  
port port] { remote-tag rtag } | remote-ip remote_ip_address {{vr  
vr_name} {from [ source_ip_address | auto-source-ip]} {ping-check [on |  
off]} priority priority_value ]} {description mirror-desc}
```

```
enable mirror {mirror_name} to remote-ip remote_ip_address {{vr  
vr_name} {priority priority_value} {from [source_ip_address | auto-  
source-ip]} {ping-check [on | off]}}
```

```
configure mirror mirror_name {to [port port | port-list port_list |  
loopback port port | remote-ip {add}remote_ip_address {{vr vr_name  
{from [ source_ip_address | auto-source-ip]} {ping-check [on | off ]}}]  
{remote-tag rtag | port none} {priority priority_value}
```

The following show command now shows redundant remote IP address information:

```
show mirror [mirror_name | control_index | mirror_name_li] |[all |  
enabled]
```

Audio Video Bridge (AVB) Supported on ExtremeSwitching X465 Series Switches

Starting with ExtremeXOS 30.4, Audio Video Bridge (AVB) is supported on ExtremeSwitching X465 series switches on the front panel ports and all ports on the following VIMs:

- VIM5-4X
- VIM5-2Y
- VIM5-4Y
- VIM5-2Q

The AVB feature requires the AVB Feature Pack license. For more information about licenses, see [ExtremeXOS 30.4 Feature License Requirements](#).

ExtremeSwitching X690 Now Stacks with ExtremeSwitching X465 Series Switches

In ExtremeXOS 30.4, the ExtremeSwitching X690 series switches now stacks (V160 stacking method) with the ExtremeSwitching X465 series switches.

Extended Edge Switching Ring Topology

The Extended Edge Switching ring topology feature allows two Extended Edge Switching (VPEx) cascades to be joined together to form a control plane ring. When 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. This provides redundant connection from any BPE in the ring to the CB. This is especially useful in a wiring closet application where the BPEs are located in the closet, and the CB is located more centrally, and there are only two links wired from the CB to the closet. Each cascade is formed from the control plane perspective only; the data plane acts as if there were two cascades consisting of BPEs that are each present in only one cascade.

The Extended Edge Switching Ring Topology feature was originally released in ExtremeXOS 22.7, and is being introduced to the ExtremeXOS 30.x branch in 30.4.

Supported Platforms

CBs: Summit X670-G2 and ExtremeSwitching X465, X690, X590 series switches.

BPEs: V400-24t-10GE2, V400-24p-10GE2, V400-48t-10GE4, and V400-48p-10GE4 bridge port extenders.

Limitations

- A maximum of 8 BPEs per ring is supported.
- A ring can be formed from exactly one or two cascades. A cascade (or any part thereof) can be a part of at only one ring.
- Three-way MLAG is not supported.

New CLI Commands

```
configure vpex mlag-id mlag_id peer peer_name slot slot_num
```

```
unconfigure vpex [ports port_list | mlag-id] mlag_id slot
```

```
show vpex topology { port port_num } {summary | detail}
```

```
configure vpex ring rebalancing [auto | off]
```

Changed CLI Commands

The following show commands now display Extended Edge Switching ring topology information:

```
show vpex bpe
```

```
show vpex ports ports_list
```

```
show vpex
```

Multi-Switch Link Aggregation Group (MLAG) Support for Change of Authentication (CoA)

Starting with ExtremeXOS 30.4, MLAG support for Network Login (Netlogin) is extended for dynamic authorization and disconnect (CoA). CoA support (introduced in ExtremeXOS 22.1), which was implemented directly in the policy module now moves to NetLogin.

The CoA messages that were previously handled directly by the policy module are now handled by the NetLogin module. With ExtremeXOS 30.4, the AAA module, on receiving the CoA messages from the RADIUS server, passes the data to NetLogin. Netlogin checks for the availability of the client, and the mode of authentication. If it finds a valid client, the CoA message is passed to policy for further processing. Additionally, NetLogin takes care of updating the MLAG peer about the dynamic authorization changes or disconnect. The NetLogin module on the MLAG peer passes the message to the policy module of that switch.

Supported Platforms

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

Limitations

- CoA support is not provided for web-based clients.
- The CoA server is aware of only the MLAG authenticator, so if the ISC link is down, one MLAG peer may have a client in a different profile with respect to the other MLAG node. This is resolved after the ISC link becomes active. This is a limitation of the CoA server.

Fabric Attach Standalone Proxy over Multi-switch Link Aggregation Group (MLAG)

Starting with ExtremeXOS 30.4, Fabric Attach standalone proxy works over multi-switch link aggregation group (MLAG).

Supported Platforms

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

Optimization of Switch Resources

To free up more switch slice resources for ACLs or other services, the IP protocol filter will not be installed automatically. Instead, it is installed only when any routing protocols are enabled. This is useful for configurations where system ACL resource usage is constrained, especially on the ExtremeSwitching X440-G2 and X620 series switches, which have less ACL slice resources.

Supported Platforms

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

Provide ONEPolicy VLAN to Universal Port Management (UPM)

Previously, Universal Port Management (UPM) scripting (and associated SNMP traps for authentication/unauthentication) did not receive the authentication VLAN that was chosen by Policy to authenticate to. ExtremeXOS 30.4 provides this VLAN information from Policy to Network Login, so that UPM scripts can make use of this information. VLAN information also appears in the ClientAuthenticated Syslog messages.

Supported Platforms

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

Limitations

Dynamic VLANs are not fully supported for this feature, since a dynamic VLAN can be created prior to the client being authenticated. In such cases, the VLAN appears as "<not found> xxx" where "xxx" is the VLAN number, rather than the VLAN name, which usually appears. UPM VLAN processing also does not function, since the VLAN has not yet been created.

ONEPolicy Captive Portal ACL Optimization

If not specified to do otherwise, ONEPolicy programs its captive portal-related rules outside of the reserved ACL rule space for ONEPolicy. This results in additional ACL slice usage. This feature allows you to specify that these rules are programmed within the already reserved ACL rule space at the expense of IPv4 rule capacity. This is useful for configurations where system ACL resource usage is constrained, especially on the ExtremeSwitching X440-G2 and X620 series switches, which have less ACL slice resources. For example, when policy is enabled and application telemetry is also enabled.

Supported Platforms

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

New CLI Commands

```
configure policy captive-portal rule-use [reserved | unreserved]
```

Changed CLI Commands

Changes are underlined.

```
show policy captive-portal {web-redirect {redirect_index | all} | listening | rule-use}
```

REST API Support for Spanning Tree Protocol (STP)

ExtremeXOS 30.4 provides REST API support for GET/SET operations based on Open Config model of Spanning Tree Protocol (STP).

Supported Platforms

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

Layer 7 Policy/Application Signature

Policy rules are used to assign incoming traffic to a specific policy profile. Layer 7 policy/application signature provides an additional traffic classification capability. This layer 7 classification is accomplished by the snooping of DNS packets for pre-defined traffic application signatures.

Layer 7 policy is based on the use of the ENTERASYS-APPLICATION-SIGNATURE-MIB.

Supported Platforms

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

Limitations

- V6 is not supported.
- Rule creation and deletion are controlled by a time-to-live (TTL) 5 second timer.
- When VCAP (first-stage ACL) space runs out, any IP rule not already installed in hardware is not created. New attempts to install previously uninstalled rules occur after the 5 second TTL timer interval and are dependent upon the space made available by other rules that have timed out.

New CLI Commands

```
configure policy app-signature group group name name [add | delete]
pattern_list
```

```
unconfigure policy app-signature group group [name name | custom]
```

```
show policy app-signature group {group {name name}} {built-in | custom
{detail} | detail}
```

```
configure policy slices {shared shared} {tci-overwrite slices}
```

```
show policy slices
```

Changed CLI Commands

Changes are underlined.

```
configure policy rule profile_index [{app-signature group group name
name} | ether ether | icmp6type icmp6type | icmptype icmptype | ip6dest
ip6dest | ipdestsocket ipdestsocket | ipfrag | ipproto ipproto |
ipsourcesocket ipsourcesocket | iptos iptos | ipttl ipttl | macdest
macdest | macsource macsource | port port | tcpdestportIP tcpdestportIP
| tcpsourceportIP tcpsourceportIP | udpdestportIP udpdestportIP |
udpsourceportIP udpsourceportIP ] {mask mask } {port-string
[ port_string | all]} {storage-type [non-volatile | volatile]} {drop |
forward} {syslog syslog} {trap trap} {cos cos } {mirror-destination
control_index} {clear-mirror}
```

```
unconfigure policy rule [ profile_index] [all-pid-entries ] | [{ether |
icmp6type | icmptype | ip6dest | ipdestsocket | ipfrag | ipproto |
ipsourcesocket | iptos | ipttl | macdest | macsource | port |
tcpsourceportIP | udpsourceportIP | tcpdestportIP | udpdestportIP ]
```

```
{app-signature} [all-traffic-entries | data] {mask mask} {port-string
port_string|all}}
```

```
show policy rule {all | app-signature | {profile-index profile_index |
admin-profile} ether {ether} | icmp6type {icmp6type} | icmptype
{icmptype} | ip6dest {ip6dest} | ipdest {ipdest} | ipfrag | ipproto
{ipproto} | ipsource { ipsource } | iptos { iptos } | ipttl { ipttl } |
macdest { macdest } | macsource { macsource } | port { port } |
tcpdestportIP { tcpdestportIP } | tcpsourceportIP { tcpsourceportIP } |
udpdestportIP { udpdestportIP } | udpsourceportIP { udpsourceportIP }}
{mask mask } {port-string [ port_string | all]} {storage-type [non-
volatile | volatile]} {drop | forward} {cos cos | admin-pid admin_pid }}
{detail | wide}
```

Network Time Protocol (NTP) Supports SHA-256 Key Authentication Type

ExtremeXOS 30.4 introduces SHA-256 authentication for server, peer, broadcast, and broadcast client.

Supported Platforms

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

Changed CLI Commands

Changes are underlined>.

```
create ntp key keyid [md5 | sha256] {encrypted encrypted_key_string |
key_string}
```

The following show command now displays SHA-256 information:

```
show ntp key
```

Insight for Guest Virtual Machines (VMs) Enhancements

ExtremeXOS 30.4 introduces the following abilities to Insight for Guest Virtual Machines (VMs):

- Restart (reboot) VMs.
- Export a disk image of an existing VM.
- Create a VM using VMDK format disk image.

Supported Platforms

ExtremeSwitching X465-24MU and X465-24MU-24W switches with a Core license.

New CLI Commands

```
restart vm vm_name {forceful | graceful}
```

```
save vm vm_name image image_file
```

Changed CLI Commands

The following command now supports creating a VM using a VMDK format disk image:

```
create vm vm_name image image_file {memory memory_size} {cpus num_cpus}
```

Support for EVPN Type 1 (Ethernet Segment) and 4 (Auto Discovery)

While the current EVPN implementation generates Type 1 (Auto Discovery) and Type 4 (Ethernet Segment) routes in multi-homing/MLAG topologies running BGP auto-peering, these routes are not actually used in route selection and designated forwarder election. However, for completeness the following BGP show commands have been enhanced to include these route types to support future implementation.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X465, X590, X690, X870 series switches.

Changed CLI Commands

Changes are underlined>.

```
show bgp {neighbor} remoteaddr {address-family [ipv4-unicast | ipv4-multicast | ipv6-unicast | ipv6-multicast | ipv4-vxlan | {l2vpn-evpn [inclusive-multicast | mac-ip | auto-discovery | esi]}]} [accepted-routes | received-routes | rejected-routes | transmitted-routes] {detail} [all | as-path path-expression | community [no-advertise | no-export | no-export-subconfed | number community_number | autonomous-system-id : bgp-community] | network [any/netMaskLen | networkPrefixFilter] {exact}]
```

```
show bgp routes {address-family [ipv4-unicast | ipv4-multicast | ipv6-unicast | ipv6-multicast | ipv4-vxlan | {l2vpn-evpn [inclusive-multicast | mac-ip | auto-discovery | esi]}]} {detail} [ipv4-vxlan | all | as-path path-expression | community [no-advertise | no-export | no-export-subconfed | number community_number | autonomous-system-id bgp-community] | network [any/netMaskLen | networkPrefixFilter] {exact}] {vr vr_name}
```

Firmware Update Needed for ExtremeSwitching X465 Series Switches

If you have purchased an ExtremeSwitching X465 series switch, it may need to have the firmware updated. To determine if you need to update the switch, do one of the following:

- Check the log by using the command `show log match firmware` and look for the following EMS message:

```
<Warn:HAL.Card.Warning> Switch CPLD firmware is out of date, do 'install firmware' to update.
<Warn:HAL.Card.Warning> Switch FPGA firmware is out of date, do 'install firmware' to update.
```

- View the firmware version on the switch by using the command `show version detail`:

```
# show version detail
Switch          : 800908-00-02 1907F-10008 Rev 02 BootROM: N/A          IMG: 30.4.1.1
```

```
FPGA: 1.2.41 CPLD: 1.1.18 VPLD: 1.1.13
VIM5-4XE-1      : 800910-01-04 1845F-10084 Rev 04
XN-SSD-001-120-1: 800954-00-02 1917F-10064 Rev 02

Image   : ExtremeXOS version 30.4.1.1 by release-manager
         on Sat Nov 9 10:30:47 EST 2019
Diagnostics : 1.1.10
Certified Version : EXOS Linux 4.14.123, FIPS fips-ecp-2.0.16

Build Tools Version : exos-x32-sdk-2.5.3.1.0
```

The current versions should be FPGA 1.2.41 and CPLD 1.1.18. If you have a VIM installed, the current version is VIM PLD 1.1.13.

If the firmware is out of date, run the `install firmware {force} {slot slot-number}` command to update the firmware. Running the update can take three to four minutes. Reboot the switch after updating it to activate the firmware.

Extreme Hardware/Software Compatibility and Recommendation Matrices

The *Extreme Hardware/Software Compatibility and Recommendation Matrices* provide information about the minimum version of ExtremeXOS software required to support switches, as well as pluggable transceivers and cables.

This guide also provides information about which optics are supported on which hardware platforms, and the minimum software version required.

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

Compatibility with Extreme Management Center (Formerly NetSight)

ExtremeXOS 30.4 is compatible with the version of Extreme Management Center as shown in this table: http://emc.extremenetworks.com/content/common/releasesnotes/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 30.4 User Guide*.

Tested Third-Party Products

This section lists the third-party products tested for ExtremeXOS 30.4.

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)

PoE Capable VoIP Phones

The following PoE capable VoIP phones are fully tested:

- Avaya 4620
- Avaya 4620SW IP telephone
- Avaya 9620
- Avaya 4602
- Avaya 9630
- Avaya 4621SW
- Avaya 4610
- Avaya 1616
- Avaya one-X
- Cisco 7970
- Cisco 7910
- Cisco 7960
- ShoreTel ShorePhone IP 212k
- ShoreTel ShorePhone IP 560
- ShoreTel ShorePhone IP 560g
- ShoreTel ShorePhone IP 8000
- ShoreTel ShorePhone IP BB 24
- Siemens OptiPoint 410 standard-2
- Siemens OpenStage 20
- Siemens OpenStage 40
- Siemens OpenStage 60
- Siemens OpenStage 80

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

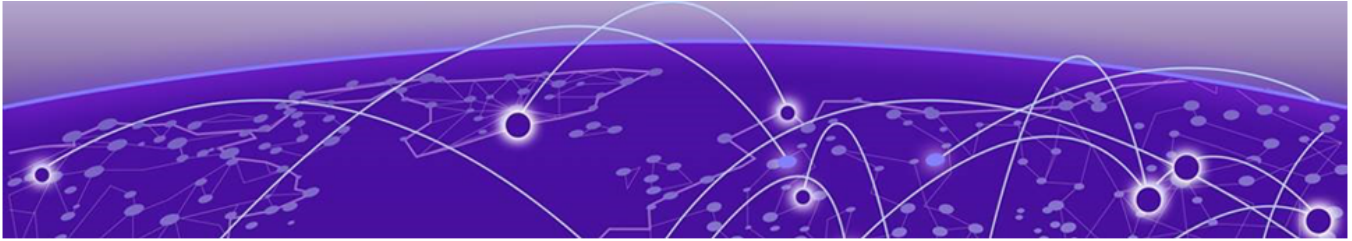
Port Scan Assessment

Tools used to assess port scan assessment:

- Nessus

Service Notifications

To receive proactive service notifications about newly released software or technical service communications (for example, field notices, product change notices, etc.), register at: www.extremenetworks.com/support/service-notification-form



Limits

This chapter summarizes the supported limits in ExtremeXOS 30.4.

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

- [Supported Limits for Edge License](#) on page 25
- [Supported Limits for Advanced Edge License](#) on page 51
- [Supported Limits for Core License](#) on page 58

For more information about licenses, see [ExtremeXOS 30.4 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, Summit X670-G2 series switches) in use. For applicable limits, see the following tables for the controlling bridge you are using.

Supported Limits for Edge License

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

Table 4: Supported Limits for Edge License

Metric	Product	Limit
AAA (local) —maximum number of admin and local user accounts.	All platforms	16
Access lists (meters) —maximum number of meters.	ExtremeSwitching X620, X440-G2	1,024 ingress 256 egress
	Summit X670-G2, X450-G2, X460-G2	1,024 ingress 512 egress
	ExtremeSwitching X870, X690, X590, X465	2,048 ingress 512 egress
Access lists (policies) —suggested maximum number of lines in a single policy file.	All platforms	300,000
Access lists (policies) —maximum number of rules in a single policy file. ^a	Summit 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	8,192 ingress 1,024 egress
Access lists (policies) —maximum number of rules in a single policy file in first stage (VFP).	Summit X450-G2, X460-G2	2,048 ingress only
	Summit X670-G2, ExtremeSwitching X870, X690	1,024 ingress only
	ExtremeSwitching X620, X440-G2	512 ingress only
	ExtremeSwitching X590, X465	2,048 ingress only
Access lists (slices) —number of ACL slices.	Summit X460-G2, X450-G2	16 ingress 4 egress
	Summit X670-G2, ExtremeSwitching X690, X590, X465	12 ingress 4 egress
	ExtremeSwitching X440-G2, X620	8 ingress 4 egress
	ExtremeSwitching X870	4 ingress 4 egress
Access lists (slices) —number of ACL slices in first stage (VFP).	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X465, X620, X440-G2, X870, X690, X590	4 ingress only

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
ACL Per Port Meters —number of meters supported per port.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16
ACL port ranges	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	32
Meters Packets-Per-Second Capable	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	Yes
AVB (audio video bridging) —maximum number of active streams.	Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	1,024
	Summit X670-G2	4,096
	ExtremeSwitching X590, X690, X870	N/A
BFD sessions (Software Mode) —maximum number of BFD sessions.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X440-G2, X620, X870, X690, X590, X465 (default timers—1 sec)	512
	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X440-G2, X620, X870, X690, X590, X465 (minimal timers—100 msec)	10 ^C
BFD IPv4 sessions (Hardware Assisted) —maximum number of IPv4 BFD sessions.	Summit X460-G2, ExtremeSwitching X870, X690, X590, X465	900 (PTP not enabled) 425 (PTP enabled) 256 (with 3 ms transmit interval)
BFD IPv6 sessions (Hardware Assisted) —maximum number of IPv6 BFD sessions.	Summit X460-G2, ExtremeSwitching X870, X690, X590, X465	425 (PTP not enabled)
BOOTP/DHCP relay —maximum number of BOOTP or DHCP servers per virtual router.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	8
BOOTP/DHCP relay —maximum number of BOOTP or DHCP servers per VLAN.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	8
BOOTP/DHCP relay —maximum number of DHCPv4/v6 relay agents	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	4,000
Connectivity fault management (CFM) —maximum number of CFM domains. Note: With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	8

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
<p>CFM—maximum number of CFM associations.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	256
<p>CFM—maximum number of CFM up end points.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	32
<p>CFM—maximum number of CFM down end points.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	32
	Summit X460-G2	256 (non-load shared ports) 32 (load shared ports)
<p>CFM—maximum number of CFM remote end points per up/down end point.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	2,000
<p>CFM—maximum number of dotlag ports.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	128
<p>CFM—maximum number of CFM segments.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	1,000
<p>CFM—maximum number of MIPs.</p> <p>Note: With Advanced Edge license or higher.</p>	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	256
<p>CLEAR-Flow—total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs.</p>	Summit X460-G2, X670-G2, X450-G2	4,094
	ExtremeSwitching X440-G2, X620	1,024
	ExtremeSwitching X870	3,072
	ExtremeSwitching X690, X590, X465	8,192

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs) —maximum number of DCBX application TLVs.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	8
DHCPv6 Prefix Delegation Snooping —Maximum number of DHCPv6 prefix delegation snooped entries.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	256 (with Underlying Protocol Ripng) 128 (with Underlying protocol OSPFv3) 1,024 (with static routes)
DHCP snooping entries —maximum number of DHCP snooping entries.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	2,048
Dynamic ACLs —maximum number of ACLs processed per second. Note: Limits are load-dependent.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	
	with 50 DACLs with 500 DACLs	10 5
EAPS domains —maximum number of EAPS domains. Note: An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains. Note: You can increase the number of domains by upgrading to the Advanced Edge license.	Summit X670-G2, X450-G2, X460-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	4
EAPsv1 protected VLANs —maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X870, X690, X590, X465	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.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	4
ERPSv1 protected VLANs —maximum number of protected VLANs.	ExtremeSwitching X870, X690, X590, X465	2,000
	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X620, X440-G2	1,000

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
ERPSv2 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	2,000
	ExtremeSwitching X620, X440-G2	500
ELSM (vlan-ports)—maximum number of VLAN ports.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X870, X690, X590, X465	5,000
	ExtremeSwitching X440-G2	4,000
Extended Edge Switching maximum BPEs—maximum number of attached bridge port extenders (BPEs).	Summit X670-G2, ExtremeSwitching X690, X590, X465	48
Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs).	Summit X670-G2, ExtremeSwitching X690, X590, X465	2 on V400-24 models 4 on V400-48 models
Extended Edge Switching maximum tiers—maximum number of cascade levels (tiers) of bridge port extenders (BPEs).	Summit X670-G2, ExtremeSwitching X465, X690, X590	4
Extended Edge Switching maximum ring BPEs—maximum number of bridge port extenders (BPEs) in a ring topology.	Summit X670-G2, ExtremeSwitching X465, X690, X590	8
Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships.	Summit X670-G2, ExtremeSwitching X690, X590, X465	12,000 in hash mode (default) 131,000 in port-group mode
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X690, X590, X465	30,000 pps
	ExtremeSwitching X870	32,000 pps
	Summit X450-G2	16,000 pps
	Summit X460-G2	17,000 pps
	ExtremeSwitching X620	10,000 pps
	Summit X670-G2	15,000 pps
	ExtremeSwitching X440-G2	9,000 pps

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
FDB (unicast blackhole entries)— maximum number of unicast blackhole FDB entries.	Summit X460-G2	49,152 ^f
	Summit X670-G2	294,912 ^f
	Summit X450-G2	34,816 ^f
	ExtremeSwitching X620, X440-G2	16,384 ^f
	ExtremeSwitching X870	139,264 ^f
	ExtremeSwitching X690, X590, X465	278,528 ^f
FDB (multicast blackhole entries)— maximum number of multicast blackhole FDB entries.	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	1,024
	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	4,096
FDB (maximum L2 entries)— maximum number of MAC addresses.	Summit X460-G2	98,300 ^g
	Summit X670-G2	294,912 ^g
	Summit X450-G2	68,000 ^g
	ExtremeSwitching X620, X440-G2	16,384
	ExtremeSwitching X870	139,264 ^g
	ExtremeSwitching X690, X590, X465	278,528 ^g
FDB (Maximum L2 entries)— maximum number of multicast FDB entries.	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	4,096
	Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	1,024
Identity management—maximum number of Blacklist entries.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	512
Identity management—maximum number of Whitelist entries.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	512
Identity management—maximum number of roles that can be created.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	64
Identity management—maximum role hierarchy depth allowed.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	5
Identity management—maximum number of attribute value pairs in a role match criteria.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16
Identity management—maximum of child roles for a role.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
Identity management—maximum number of policies/dynamic ACLs that can be configured per role.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
Identity management —maximum number of LDAP servers that can be configured.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
Identity management —maximum number of Kerberos servers that can be configured.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	20
Identity management —maximum database memory size.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	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.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	100
Identity management —recommended number of ACL entries per identity. Note: Number of ACLs per identity, based on system ACL limitation.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	20
Identity management —maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	500
IGMP snooping per VLAN filters —maximum number of VLANs supported in per-VLAN IGMP snooping mode.	Summit X460-G2, ExtremeSwitching X870	1,500
	Summit X450-G2	2,048
	Summit X670-G2	2,000
	ExtremeSwitching X620, X440-G2	1,000
	ExtremeSwitching X690, X590, X465	4,000
IGMPv1/v2 SSM-map entries —maximum number of IGMPv1/v2 SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	500
IGMPv1/v2 SSM-map entries —maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	50
IGMPv2 subscriber —maximum number of IGMPv2 subscribers per port. ⁿ	Summit X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690, X590, X465	4,000

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch. ⁿ	Summit X670-G2	30,000
	Summit X460-G2, X450-G2	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X465, X870, X690, X590	45,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port. ⁿ	Summit X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690, X590, X465	4,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch. ⁿ	Summit X460-G2, X450-G2	20,000
	Summit X670-G2	30,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690, X590, X465	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).	Summit X670-G2	131,072 (up to) ^h
	Summit X460-G2	57,344 (up to) ^h
	Summit 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
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
	Summit X460-G2	50,000 (up to) ^h
	Summit X670-G2	108,000 (up to) ^h
	Summit 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

Table 4: 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
	Summit X460-G2	43,000 (up to) ^h
	Summit X670-G2	98,000 (up to) ^h
	Summit 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
IP flow information export (IPFIX)—number of simultaneous flows.	Summit X460-G2	2,048 ingress 2,048 egress
	Summit X450-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	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
	Summit X460-G2	73,000 ^h
	Summit X670-G2	176,000 (up to) ^h
	Summit X450-G2	61,000 (up to) ^h
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X690, X590, X465	216,000 (up to) ^h
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	Summit X460-G2, X450-G2, X440-G2, X620	25,000
	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	131,000
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	Summit X460-G2	12,000
	Summit X450-G2	16,000
	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	131,000 ^q
	ExtremeSwitching X620, X440-G2	480
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	255
	ExtremeSwitching X440-G2, X620	N/A

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	1 (per virtual router)
	ExtremeSwitching X440-G2, X620	N/A
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	255
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	Summit X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	2,048
	ExtremeSwitching X620, X440-G2	510
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	Summit X670-G2	36,750 ^h
	Summit X460-G2	22,000 ^h
	Summit X450-G2	12,000 ^h
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X690, X590, X465	24,500 ^h
	ExtremeSwitching X870	22,000 ^h
IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	25,000
	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	65,000 ^q
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	Summit X460-G2	6,000
	Summit X450-G2	8,000
	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	65,000 ^q
	ExtremeSwitching X620, X440-G2,	240
IPv6 routes with a mask greater than 64 bits in hardware—maximum number of such IPv6 LPM routes in hardware.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	8,192 ^r
	ExtremeSwitching X440-G2, X620	1,024
	Summit X450-G2, X460-G2	2,048
IPv6 route sharing in hardware—route mask lengths for which ECMP is supported in hardware.	Summit X460-G2, X450-G2, and ExtremeSwitching X620	0-64 >64 single path only
	Summit X670-G2, and ExtremeSwitching X690, X870, X590, X465	0-128 ^r
	ExtremeSwitching X440-G2	Not supported
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	2,048
	ExtremeSwitching X620, X440-G2	510

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
IP multicast static routes —maximum number of permanent multicast IP routes.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	1,024
IP unicast static routes —maximum number of permanent IP unicast routes.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	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.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X620, X870, X690, X590, X465	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X440-G2	N/A

Table 4: 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.	Summit 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
	Summit 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		
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 30.4 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 4: 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
IP multinetting (secondary IP addresses) —maximum number of secondary IP addresses per VLAN.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	255
Jumbo frames —maximum size supported for jumbo frames, including the CRC.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	9,216
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch —maximum number of VCCV enabled VPLS VPNs.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	16
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: VPLS MAC addresses —maximum number of MAC addresses learned by a switch.	Summit X670-G2, ExtremeSwitching X690, X590, X465	140,000
	Summit X460-G2	55,000
	ExtremeSwitching X870	65,000
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: VPLS VPNs —maximum number of VPLS virtual private networks per switch.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	1,023
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: VPLS peers —maximum number of VPLS peers per VPLS instance.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	64
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: LDP pseudowires —maximum number of pseudowires per switch.	Summit X670-G2, X460-G2, and ExtremeSwitching X870, X690, X590, X465	7,000
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: static pseudowires —maximum number of static pseudowires per switch.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	7,000
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
L2 VPN: Virtual Private Wire Service (VPWS) VPNs —maximum number of virtual private networks per switch.	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	4,090
	Summit X460-G2	1,023
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
Layer-2 IPMC forwarding caches —(IGMP/MLD/PIM snooping) in mac-vlan mode. Note: <ul style="list-style-type: none"> The internal lookup table configuration used is "I2-and-I3". 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. 	Summit X670-G2	73,000
	Summit X460-G2	24,000
	Summit X450-G2	14,000
	ExtremeSwitching X620, X440-G2	5,000
	ExtremeSwitching X870	36,000
	ExtremeSwitching X690, X590, X465	67,000
Layer-3 IPv4 Multicast —maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). Note: <ul style="list-style-type: none"> 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 I3-and-ipmc". Assumes source-group-vlan mode as look up key. Layer 3 IPMC cache limit in mixed mode also has the same value. 	Summit X460-G2	26,000
	Summit X450-G2	21,000
	Summit X670-G2	77,500
	ExtremeSwitching X620, X440-G2	1,500
	ExtremeSwitching X870	52,000
	ExtremeSwitching X690, X590, X465	93,000

Table 4: 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: <ul style="list-style-type: none"> 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. 	Summit X670-G2	30,000
	Summit X460-G2	14,000
	Summit X450-G2	10,000
	ExtremeSwitching X620, X440-G2	700
	ExtremeSwitching X870	18,000
	ExtremeSwitching X690, X590, X465	48,000
Load sharing —maximum number of load sharing groups. Note: The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.	Summit X450-G2, X460-G2, X670-G2, , and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	128
Load sharing —maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2	8
	For standalone: Summit X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	32
	For stacked: Summit X670-G2, X460-G2, X450-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	64
Logged messages —maximum number of messages logged locally on the system.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	20,000
MAC-based security —maximum number of MAC-based security policies.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	1,024
MAC Locking —Maximum number of MAC locking stations that can be learned on a port.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters —maximum number of meters supported.	Summit X460-G2, X450-G2, X670-G2, ExtremeSwitching X440-G2, X620, X870, X690, X590 , X465	2,048

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
Maximum mirroring instances	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465 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: <ol style="list-style-type: none"> 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)
Mirroring (filters) —maximum number of mirroring filters. Note: This is the number of filters across all the active mirroring instances.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	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.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	128
Mirroring, one-to-many (monitor port) —maximum number of one-to-many monitor ports.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
MLAG ports—maximum number of MLAG ports allowed.	Summit X670-G2, ExtremeSwitching X690	71
	ExtremeSwitching X440-G2, Summit X450-G2	51
	Summit X460-G2	53
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
MLAG peers—maximum number of MLAG peers allowed.	ExtremeSwitching X590, X465	35
	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	2
MPLS RSVP-TE interfaces—maximum number of interfaces.	Summit X460-G2, X670-G2, ExtremeSwitching X590, X465, X870	32
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X590, X690, X465	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620 X590, X465	N/A
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690 X590,, X465	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	Summit X460-G2, X670-G2	2,000
	ExtremeSwitching X870, X690 X590,, X465	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE paths—maximum number of paths.	Summit X460-G2	1,000
	Summit X670-G2, ExtremeSwitching X870, X690 X590,, X465	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	Summit X460-G2	1,000
	Summit X670-G2, ExtremeSwitching X870, X690 X590,, X465	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690 X590,, X465	64
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A

Table 4: Supported Limits for Edge License (continued)

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

Table 4: Supported Limits for 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.	Summit X460-G2, X670-G2, ExtremeSwitching X870	768
	Summit X450-G2	508
	ExtremeSwitching X620, X440-G2	256
	ExtremeSwitching X690, X590, X465	1,500
Multicast listener discovery (MLD)v1 subscribers —maximum number of MLDv1 subscribers per port. ⁿ	Summit X670-G2, X450-G2, X460-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590, X465	4,000
Multicast listener discovery (MLD)v1 subscribers —maximum number of MLDv1 subscribers per switch. ⁿ	Summit X460-G2, X450-G2, ExtremeSwitching X620, X440-G2	10,000
	Summit X670-G2	30,000
	ExtremeSwitching X870, X690, X590, X465	45,000
Multicast listener discovery (MLD)v2 subscribers —maximum number of MLDv2 subscribers per port. ⁿ	Summit X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690, X590, X465	4,000
Multicast listener discovery (MLD)v2 subscribers —maximum number of MLDv2 subscribers per switch. ⁿ	Summit X670-G2	30,000
	Summit X460-G2, X450-G2, ExtremeSwitching X620, X440-G2	10,000
	ExtremeSwitching X870, X690, X590, X465	45,000
Multicast listener discovery (MLD)v2 maximum source per group —maximum number of source addresses per group.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	200
Multicast listener discovery (MLD) SSM-map entries —maximum number of MLD SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	500
	ExtremeSwitching X440-G2, X620	50
Multicast listener discovery (MLD) SSM-MAP entries —maximum number of sources per group in MLD SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	50
Network Login —maximum number of clients being authenticated on MAC-based VLAN enabled ports.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	1,024
	Summit X450-G2, X460-G2, ExtremeSwitching X590, X465	1,024
Network Login —maximum number of clients being authenticated with policy mode enabled with TCI overwrite enabled.	Summit X670-G2, ExtremeSwitching X870, X690	512
	ExtremeSwitching X620, X440-G2	256

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
Network Login —maximum number of dynamic VLANs.	Summit X460-G2, X450-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	2,000
	ExtremeSwitching X440-G2, X620	1,024
Network Login VLAN VSAs —maximum number of VLANs a client can be authenticated on at any given time.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	10
Network Service Identifiers (NSI)/VLAN mappings —maximum number of VLANs to NSI mappings.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	94
Node Alias —maximum number of entries per slot.	Summit X450-G2, X460-G2, X670-G2 and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8,192
ONEPolicy Roles/Profiles —maximum number of policy roles/profiles.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	63
ONEPolicy Rules per Role/Profile —maximum number of rules per role/policy.	Summit X450-G2, X460-G2	IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256
	Summit X670-G2, ExtremeSwitching 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	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Authenticated Users per Switch —maximum number of authenticated users per port only with TCI-Overwrite enabled.	Summit X450-G2, X460-G2, and ExtremeSwitching X590, X465	1,024
	Summit X670-G2, ExtremeSwitching X690, X870	512
	ExtremeSwitching X620, X440-G2	256
	Stacking	Depends on the stack nodes.
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
	Summit X670-G2, X460-G2, ExtremeSwitching X870	12,288
	Summit X450-G2	6,144
	ExtremeSwitching X620, X440-G2	1,536
	Stacking	1,536–65,534
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.	Summit X450-G2	6,144
	Summit 460-G2, X670-G2, and ExtremeSwitching X870	12,288
	ExtremeSwitching X690, X590, X465	24,576
	ExtremeSwitching X440-G2, X620	1,536
ONEPolicy Authenticated Users per Port per Switch — maximum number of authenticated users per port with only with TCI-Overwrite enabled.	Summit X450-G2, X460-G2, ExtremeSwitching X590, X465	1,024
	Summit X670-G2, ExtremeSwitching X870, X690	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).	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X690, X590, X465	1,976
ONEPolicy Permit/Deny Traffic Classification Rules Types — maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590, X465	512
ONEPolicy Permit/Deny Traffic Classification Rules Types — maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690, X590, X465	512

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Permit/Deny Traffic Classification Rules Types —maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype).	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X620, X440-G2, X870	256
	ExtremeSwitching X690, X590, X465	512
ONEPolicy Permit/Deny Traffic Classification Rules Types —maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port).	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X690, X590, X465	440
Policy-based routing (PBR) redundancy —maximum number of flow-redirects.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	256 ^o
Policy-based routing (PBR) redundancy —maximum number of next hops per each flow-direct.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	32 ^o
Private VLANs —maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	Summit X670-G2	63
	Summit X460-G2	53
	Summit X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X690	71
	ExtremeSwitching X590, X465	31
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.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	1,024
	Summit X450-G2	510
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
Private VLANs —maximum number of private VLANs in an L2-only environment.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	1,280
	Summit X450-G2	597
	ExtremeSwitching X440-G2, X620	255

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
PTP/1588v2 Clock Ports	Summit X460-G2, X670-G2	32 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	N/A
PTP/1588v2 Clock Instances	Summit X670-G2, X460-G2	2 combinations: <ul style="list-style-type: none"> • Transparent clock + ordinary clock • Transparent clock + boundary clock
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	N/A
PTP/1588v2 Unicast Static Slaves	Summit X670-G2, X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	N/A
PTP/1588v2 Unicast Static Masters	Summit X670-G2, X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X465, X620, X870, X690, X590	N/A
Route policies—suggested maximum number of lines in a route policy file.	Summit X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	Summit X670-G2, X460-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	Summit X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	256
	ExtremeSwitching X440-G2, X620	128
RIPng learned routes—maximum number of RIPng routes.	Summit X670-G2, X460-G2, X450-G2, X870, X690, X590, X465	3,000
	ExtremeSwitching X440-G2, X620	N/A
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	Summit X450-G2, X670-G2, X460-G2, and ExtremeSwitching X620, X870, X690, X590, X465	64
	ExtremeSwitching X440-G2	32

Table 4: 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).	Summit X670-G2, and ExtremeSwitching X620	256
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2	128
	ExtremeSwitching X870, X690, X590 , X465	384
Spanning Tree —maximum number of multiple spanning tree instances (MSTI) domains.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X870, X690, X590 , X465	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.	Summit X670-G2	500
	Summit X460-G2, X450-G2, ExtremeSwitching X620, X870, X690, X590 , X465	600
	ExtremeSwitching X440-G2	256
Spanning Tree —maximum number of VLANs on all MSTP instances.	Summit X670-G2, X460-G2, X450-G2, ExtremeSwitching X620, X870, X690, X590 , X465	1,024
	ExtremeSwitching X440-G2	512
Spanning Tree (802.1d domains) —maximum number of 802.1d domains per port.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590 , X465	1
Spanning Tree (number of ports) —maximum number of ports including all Spanning Tree domains.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X870, X690, X590, X465	4,096
	ExtremeSwitching X440-G2	2,048
Spanning Tree (maximum VLANs) —maximum number of STP-protected VLANs (dot1d and dot1w).	Summit X670-G2, X460-G2, X450-G2, and ExtremeSwitching X620, X870, X690, X590, X465	1,024
	ExtremeSwitching X440-G2	600
SSH (number of sessions) —maximum number of simultaneous SSH sessions.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
Static MAC multicast FDB entries —maximum number of permanent multicast MAC entries configured into the FDB.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	1,024
Syslog servers —maximum number of simultaneous Syslog servers that are supported.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16
Syslog targets —maximum number of configurable Syslog targets.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16
Telnet (number of sessions) —maximum number of simultaneous Telnet sessions.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
Virtual routers —maximum number of user-created virtual routers that can be created on a switch.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	63
	ExtremeSwitching X440-G2, X620	16 (local-only VRs)
Virtual router forwarding (VRFs) —maximum number of VRFs that can be created on a switch. Note: * Subject to other system limitations.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	960 *
	ExtremeSwitching X440-G2, X620	16 (local-only VRFs)
Virtual router protocols per VR —maximum number of routing protocols per VR.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	8
	ExtremeSwitching X440-G2, X620	N/A
Virtual router protocols per switch —maximum number of VR protocols per switch.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	64
	ExtremeSwitching X440-G2, X620	N/A
VLAN aggregation —maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	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.)	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	4,094
VLANs (Layer 2) —maximum number of Layer 2 VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	4,094

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	2,048
	ExtremeSwitching X440-G2, X620	510
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with default license.	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	32
	ExtremeSwitching X440-G2	28
	Summit X460-G2	26
	ExtremeSwitching X620	16
	Summit X450-G2	29
	Summit X460-G2	24
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	Summit X670-G2	63
	Summit X460-G2	53
	Summit X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X870	127
	ExtremeSwitching X690	71
	ExtremeSwitching X590, X465	31
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.	Summit X670-G2, ExtremeSwitching X465, X870, X690, X590	1,024
	Summit X450-G2	512
	ExtremeSwitching X620	510
	ExtremeSwitching X440-G2	255
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	Summit X450-G2, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	2,046
	ExtremeSwitching X440-G2, X620	255

Table 4: Supported Limits for Edge License (continued)

Metric	Product	Limit
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.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	10 with 100 DACLS
XNV authentication —maximum number of VMs that can be processed (combination of local and network VMs).	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	2,048
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	1,024
XNV database entries —maximum number of VM database entries (combination of local and network VMs).	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	16,000
XNV database entries —maximum number of VPP database entries (combination of local and network VPPs).	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	2,048
XNV dynamic VLAN —Maximum number of dynamic VLANs created (from VPPs /local VMs).	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	2,048
XNV local VPPs —maximum number of XNV local VPPs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	2,048 ingress 512 egress
XNV policies/dynamic ACLs —maximum number of policies/dynamic ACLs that can be configured per VPP.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8 ingress 4 egress
XNV network VPPs —maximum number of XNV network VPPs. ^P	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	2,048 ingress 512 egress

Supported Limits for Advanced Edge License

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

Table 5: Supported Limits for Advanced Edge License

Metric	Product	Limit
BGP auto-peering —maximum number of auto-peering nodes and VTEPs.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	64
BGP auto-peering attached IPv4 hosts — maximum number of attached IPv4 hosts.	Summit X670-G2	16,000
	ExtremeSwitching X870, X690, X590, X465	64,000

Table 5: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
BGP auto-peering attached IPv6 hosts — maximum number of attached IPv6 hosts.	Summit X670-G2	254
	ExtremeSwitching X870, X690, X590, X465	8,000
BGP auto-peering ECMP — maximum number equal cost multipath for auto-peering. Note: * Subject to the limitation imposed by the number of physical ports on a switch.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	16*
BGP auto-peering maximum IPv4 prefixes with ECMP —Maximum number of IPv4 Network prefixes with ECMP.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	64,000
BGP auto-peering maximum IPv6 prefixes with ECMP —Maximum number of IPv6 Network prefixes with ECMP.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	8,000
BGP auto-peering MLAG peers — maximum MLAG peers per AutoBGP node.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	1
BGP auto-peering VRFs — maximum number of VRFs.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	64
BGP auto-peering EVPN instances —maximum EVPN instances.	Summit X670-G2, ExtremeSwitching X690, X870, X590, X465	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	128
	Summit X670-G2, X450-G2, X460-G2	64
	ExtremeSwitching X440-G2, X620	32
EAPsv2 protected VLANs — maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X440-G2, X620	500
	ExtremeSwitching X870, X690, X590, X465	2,000
ERPS domains —maximum number of ERPS domains without CFM configured.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	32
ERPS domains —maximum number of ERPS domains with CFM configured.	Summit X450-G2, X670-G2, and ExtremeSwitching X620, X870, X690, X590, X465	16
	Summit X460-G2	32

Table 5: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
ERPSv1 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	2,000
	ExtremeSwitching X620, X440-G2	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	2,000
	ExtremeSwitching X620, X440-G2	500
ESRP groups—maximum number of ESRP groups	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	32
ESRP domains—maximum number of ESRP domains.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	64
ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	1,000
ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	511
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	1
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	64
	ExtremeSwitching X620	4
	ExtremeSwitching X440-G2	N/A
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	8
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465	10,000
	Summit X670-G2, X460-G2	5,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	2,400

Table 5: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
OSPFv2 inter- or intra-area routes —recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain.	ExtremeSwitching X870, X690, X590, X465	4,000
	Summit X670-G2, X460-G2	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	1,000
OSPFv2 interfaces —recommended maximum number of OSPF interfaces on a switch (active interfaces only).	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	4
OSPFv2 links —maximum number of links in the router LSA.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	400
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	4
OSPFv2 neighbors —maximum number of supported OSPF adjacencies.	Summit X450-G2, X670-G2, X460-G2, and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	4
OSPFv2 routers in a single area —recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465	100
	Summit X670-G2, X460-G2	50
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv2 virtual links —maximum number of supported OSPF virtual links.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	32
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	4
OSPFv3 areas —as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465	100
	Summit X460-G2, X670-G2	16
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv3 external routes —recommended maximum number of external routes.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	10,000
	Summit X450-G2, ExtremeSwitching 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	4,000
	Summit X670-G2, X460-G2	3,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	500
OSPFv3 interfaces —maximum number of OSPFv3 interfaces (active interfaces only).	Summit X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690, X440-G2, X620, X590, X465	4
OSPFv3 neighbors —maximum number of OSPFv3 neighbors.	Summit X450-G2, X670-G2, X460-G2, ExtremeSwitching X870, X690, X440-G2, X620, X590, X465	4

Table 5: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	16
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OVSDB Manager Connections—Maximum number of connections to managers that can be configured (either of TCP, PTCP, SSL, or PSSL).	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	8
	Summit X450-G2	N/A
OVSDB Managed Switches—Maximum number of OVSDB-managed switches.	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	1
	Summit X450-G2	N/A
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X440-G2, X620, X690, X590, X465	4
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	5,000
	ExtremeSwitching X440-G2, X620	1,500
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	145
PIM IPv4 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X440-G2, X620, X690, X590, X465	4
PIM IPv6 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	1,750
	Summit X450-G2	1,500
	ExtremeSwitching X440-G2, X620	550
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	70

Table 5: Supported Limits for Advanced Edge License (continued)

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

Table 5: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
VRRP (v3-IPv6) (maximum instances) —maximum number of VRRP instances for a single switch, with Advanced Edge 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):	
	Summit X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690, X590, X465	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	Summit X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690, X590, X465	2,048
	ExtremeSwitching X440-G2, X620	128
VRRP (v2/v3-IPv4/IPv6) (maximum VRID) —maximum number of unique VRID numbers per switch. Note: With Advanced Edge license or higher.	Summit X670-G2, X460-G2, X450-G2 and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	255
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN) —maximum number of VRIDs per VLAN. Note: With Advanced Edge license or higher.	Summit X670-G2, X460-G2, X450-G2 and ExtremeSwitching X440-G2, X620, X870, X690, X590, X465	255
VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks) —maximum number of ping tracks per VLAN. Note: With Advanced Edge license or higher.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
VRRP (maximum ping tracks) —maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	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.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8 (20 centisecond or 1 second hello interval)
VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks) —maximum number of IP route tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8
VRRP (v2/v3-IPv4/IPv6) —maximum number of VLAN tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X620, X440-G2, X870, X690, X590, X465	8

Table 5: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
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.	Summit X670-G2, and ExtremeSwitching X870, X690, X590, X465	2,048–4,000
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	N/A
VXLAN —maximum tenant VLANs plus port combinations Note: Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	Summit X670-G2, and ExtremeSwitching X870, X690, X590, X465	4,096
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	N/A
VXLAN —maximum static MAC to IP bindings. Note: Every FDB entry configured reduces this limit by 1.	Summit X670-G2, and ExtremeSwitching X870, X690, X590, X465	64,000
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	N/A
VXLAN —maximum RTEP IP addresses	Summit X670-G2, and ExtremeSwitching X870, X690, X590, X465	512
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	N/A
VXLAN —maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	Summit X670-G2, and ExtremeSwitching X870, X690, X590, X465	4,000
	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	N/A

Supported Limits for Core License

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

Table 6: Supported Limits for Core License

Metric	Product	Limit
BGP (aggregates) —maximum number of BGP aggregates.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	256
	Summit X450-G2	204

Table 6: Supported Limits for Core License (continued)

Metric	Product	Limit
BGP (networks) —maximum number of BGP networks.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	1,024
	Summit X450-G2	820
BGP (peers) —maximum number of BGP peers. Note: With default keepalive and hold timers.	Summit X460-G2, X670-G2, ExtremeSwitching X870	128
	ExtremeSwitching X690, X590, X465	300
	Summit X450-G2	100
BGP (peer groups) —maximum number of BGP peer groups.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	64
	Summit X450-G2	50
BGP (policy entries) —maximum number of BGP policy entries per route policy.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	256
	Summit X450-G2	204
BGP (policy statements) —maximum number of BGP policy statements per route policy.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	1,024
	Summit X450-G2	820
BGP multicast address-family routes —maximum number of multicast address-family routes.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	25,000
	Summit X450-G2	20,000
BGP (unicast address-family routes) —maximum number of unicast address-family routes.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465 (at default)	25,000
	ExtremeSwitching X870, X690, X590, X465 (with ALPM enabled)	100,000
	Summit X450-G2	20,000
BGP (non-unique routes) —maximum number of non-unique BGP routes.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	25,000
	Summit X450-G2	20,000
BGP ECMP —maximum number of equal cost paths per multipath for BGP and BGPv6.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	2, 4, 8, 16, 32, or 64
	Summit X450-G2	64
BGPv6 (unicast address-family routes) —maximum number of unicast address family routes.	Summit X460-G2	6,000
	Summit X670-G2	8,000
	ExtremeSwitching X870, X690, X590, X465	10,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
	Summit X450-G2	4,800

Table 6: Supported Limits for Core License (continued)

Metric	Product	Limit
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	Summit X460-G2	18,000
	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	24,000
	Summit X450-G2	14,000
EVPN EVI instances—maximum number of EVI instances.	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	1,024
EVPN LAGs—maximum number of LAGs.	Summit X670-G2, ExtremeSwitching X870, X690, X590, X465	128
GRE Tunnels—maximum number of GRE tunnels.	Summit X460-G2, X670-G2, X450-G2, and ExtremeSwitching X870, X690, X590, X465	255
	ExtremeSwitching X620, X440G2	N/A
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	128
	Summit X450-G2	N/A
IS-IS ECMP—maximum number of equal cost paths per multipath for IS-IS.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	2, 4, or 8
	Summit X450-G2	N/A
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	255
	Summit X450-G2	N/A
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	256
	Summit X450-G2	N/A
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	20,000
	Summit 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.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	25,000
	Summit X450-G2	N/A
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	25,000
	Summit 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.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	20,000
	Summit 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.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	10,000
	Summit X450-G2	N/A

Table 6: Supported Limits for Core License (continued)

Metric	Product	Limit
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	10,000
	Summit X450-G2	N/A
IS-IS IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a L1/L2 router.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	10,000
	Summit 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.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	20,000
	Summit 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.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	20,000
	Summit 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.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	20,000
	Summit X450-G2	N/A
MSDP active peers—maximum number of active MSDP peers.	Summit X450-G2, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	64
MSDP SA cache entries—maximum number of entries in SA cache.	Summit X670-G2, ExtremeSwitching X690, X590, X465	14,000
	Summit X460-G2	10,000
	ExtremeSwitching X870	11,000
	Summit X450-G2	8,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	Summit X450-G2, X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	Summit X460-G2, X670-G2, X450-G2, ExtremeSwitching X870, X690, X590, X465	64
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	Summit X450-G2, X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	8

Table 6: Supported Limits for Core License (continued)

Metric	Product	Limit
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690, X590, X465	10,000
	Summit X670-G2, X460-G2	5,000
	Summit 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	4,000
	Summit X670-G2, X460-G2	2,000
	Summit X450-G2	1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	400
	Summit X450-G2	320
OSPFv2 links—maximum number of links in the router LSA.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	400
	Summit X450-G2	320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	128
	Summit X450-G2	96
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690, X590, X465	100
	Summit X670-G2, X460-G2	50
	Summit X450-G2	40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690, X590, X465	32
	Summit X450-G2	25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690, X590, X465	100
	Summit X460-G2, X670-G2	16
	Summit X450-G2	12
OSPFv3 external routes—recommended maximum number of external routes.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	10,000
	Summit X450-G2	7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690, X590, X465	4,000
	Summit X670-G2, X460-G2	3,000
	Summit X450-G2	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only).	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	256
	Summit X450-G2	192

Table 6: Supported Limits for Core License (continued)

Metric	Product	Limit
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	64
	Summit X450-G2	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690, X590, X465	16
	Summit X450-G2	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	255
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	145
PIM IPv4 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	255
PIM IPv6 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	1,750
	Summit X450-G2,	1,500
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590, X465	64

Table 6: Supported Limits for Core License (continued)

Metric	Product	Limit
PIM IPv6 Limits —maximum number of secondary addresses per interface.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590 , X465	70
PIM IPv6 Limits —static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, and ExtremeSwitching X870, X690, X590 , X465	32

^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 I2".

^h Based on "configure forwarding internal-tables more I3-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.

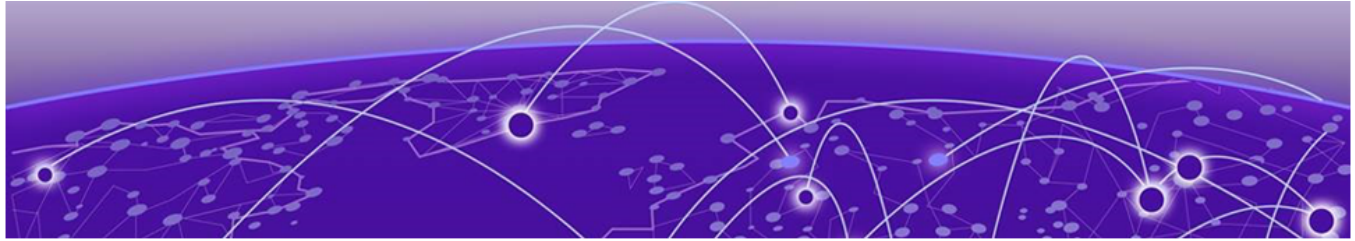
ⁿ If IGMP and MLD are simultaneously configured on the switch, the number of effective subscribers supported are lessened accordingly.

^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.



Open Issues, Known Behaviors, and Resolved Issues

[Open Issues](#) on page 65

[Known Behaviors](#) on page 66

[Resolved Issues in ExtremeXOS 30.4](#) on page 66

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 30.4.

Table 7: Open Issues, Platform-Specific, and Feature Change Requests (CRs)

CR Number	Description
General	
xos0076366	With VRRP configuration, multicast packets are duplicated on all subscriber PVLANS with loopback ports.
xos0076878	On a Fabric Attach (FA) with Extended Edge Switching configuration, if the FA Management VLAN is configured on the FA server after the proxy switches become stable, the entire configuration, including VLAN creation, is rejected.
ExtremeSwitching X440-G2 Series Switches	
xos0077772	On ExtremeSwitching X440-G2 series switches using 1G optics on 10G ports, ports do not come up after rebooting.
xos0077718	On ExtremeSwitching X440-G2 series switches with auto-discovery enabled, 10G ports 25/26 go down after reboot if ports 27/28 have optics attached or if stacking support is enabled.
BGP Auto-peering	
xos0076643	In multi-homed ECMP scenarios, missing routes occur for some of those ECMP destinations after rebooting switches. A multi-homed ECMP is when two switches have more than one link adjacency to one another. An ECMP destination is the adjacent switch's router ID. In this case, some links are not used.

Known Behaviors

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

Table 8: Known Issues, Platform-Specific, and Feature Change Requests (CRs)

CR Number	Description
General	
xos0076493	For large stacks, ZTP+ images upgrades may fail due to the Extreme Management Center (XMC) TFTP server timing out. Workaround: Change default TFTP timeout from 600 (default) to 1200 seconds.
MAC Security	
xos0076448	The LRM/MACsec Adapters cannot be connected across slots on a stack.
ONEPolicy	
xos0076380	Unable to configure greater than 63 application signature rules, even though there is a free space in the ICAP slice for the IPv4 rule group.

Resolved Issues in ExtremeXOS 30.4

The following issues were resolved in ExtremeXOS 30.4. ExtremeXOS 30.4 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, and ExtremeXOS 30.3. For information about those fixes, see the release notes for the specific release.

Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 30.4

CR Number	Description
General	
xos0075849	The command <code>show ssl</code> is not returning the output in a string when called by <code>exes.api.exec_cli()</code> ; instead, the output is sent to the terminal.
xos0075946	On ExtremeSwitching X440G2-24x switches, Source Photonics 100FX optics link up as 1G, instead of 100 Mbps.
xos0076030	EDP does not work on a port when the port is an untagged member of a non-Default VLAN with tag 1.
xos0076042	The command <code>show iproute origin static</code> shows only eight entries after reboot.
xos0076122	After a reboot, VRRP dual master occurs for around 10–15 minutes when MLAG reload delay is enabled.
xos0076150	Memory depletion occurs in process <code>aaa</code> when executing Soap/XML commands.

Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 30.4 (continued)

CR Number	Description
xos0076151	ExtremeRtStats OID is not working as expected.
xos0076184	The command <code>show port X transceiver information detail</code> does not show <code>ddmi</code> parameters for AFBR-57E6APZ-EX1 and the "-EN1" (Extreme Branded) SFPs. The command <code>debug hal show optic ee port X</code> does not show the <code>ddmi</code> page of the <code>EEPROM</code> .
xos0076221	On an unconfigured switch running ExtremeXOS 30.3, there is an issue with ZTP+ connecting to Extreme Management Center (XMC) on the management port (Mgmt VR).
xos0076285	In ExtremeXOS 22.5+ versions, ExtremeXOS switches are not accessible through the <code>URI/xmlService</code> .
xos0076290	Blackhole route not removed from kernel when it goes down in software level, leading to L3 connectivity issues.
xos0075942	After disabling, and then enabling, learning with policy, FDB is not learned.
ExtremeSwitching X690 Series Switches	
xos0076244	On ExtremeSwitching X690 series switches, LACP custom sharing is not working between PE to CE.
xos0069669	ExtremeSwitching X690 stacks crash frequently when AoC QSFP28 cable is present in the stack.
BGP Auto-peering	
xos0074505	Occasionally, while running BGP Auto-peering, enabling MLAG on a port fails. MLAG should be created before BGP Auto-peering.
BFD	
xos0076480	The transmission interval of BFD control packets is changed when the BFD session is not up.
Chalet	
xos0076219	In Chalet, inventory details do not appear for ONIE switches.
ELRP	
xos0076658	Multicast packets dropped on SLLP guard-enabled port creates dual VRRP master.
xos0075443	The hardware-assisted ELRP fails to detect loops if configured VLAN ports are move to tagged from untagged.
Fabric Attach	
xos0076153	Fabric Attach (FA) uplink port is removed from FA Mgmt VLAN after ZTP+ configuration is pushed.
xos0075220	Output of <code>show fabric attach ports port_list authentication</code> command, shows data for all ports, rather than just specified port.
MLAG	
xos0076134	MLAG ports do not come up after reboot when reload delay is configured.

Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 30.4 (continued)

CR Number	Description
xos0076152	Traffic received on ISC are not blocked and sent by the MLAG port that belongs to the same MLAG ID.
xos0076488	When MLAG convergence control is set to fast, packet drops occur on slowpath during failover.
MPLS	
xos0076359	With MPLS next-hop enabled, BGP control packets do not set Dot1p values. When MPLS exp examination/replacement is enabled, the packets do not have the proper exp bits set.
Network Login	
xos0076201	On Summit X450-G2 series switches 7-node stack, Dot1x is not working after re-configuring stacking slots.
Policy	
xos0075723	After re-authenticating the Dot1x client, FDB is learned on the wrong VLAN at random times.
xos0076662	Port not added as tagged based on egress VLAN list in policy profile after the client authentication.
xos0074235	Netlogin does not have access to the Authenticated VLAN of a policy-enabled session.
SSH	
xos0076686	For ExtremeXOS 16.2 and later, SSH has a 3-5 seconds delay for prompt password window to appear.
SNMP	
xos0076049	For QSFP+/QSFP28 optics, Rx/Tx power values do not appear correctly when fetched using SNMP.
Stacking	
xos0076203	PVLAN feature does not work properly after a failover.
xos0076215	After multiple failovers, the Multiport FDB feature does not work as expected.
STP	
xos0075874	STP convergence time increases after ISC and cascade port come up or after controlling bridge (CB) reboots causing ping traffic loss.
VLAN	
xos0074944	ExtremeXOS restricts the port addition requests on VLANs to 20 million times.
VRRP	
xos0074578	When configuring VRRP group on MLAGs, process vrrp pid 813 ends unexpectedly with signal 11.

Table 9: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 30.4 (continued)

CR Number	Description
VXLAN	
xos0075717	In VXLAN configuration, mismatch between software and hardware FDB occurs after underlay network flaps.