**Extreme networks**

# ExtremeXOS Release Notes

Software Version ExtremeXOS 30.6

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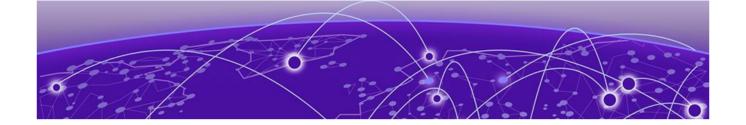
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# Table of Contents

# Preface

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

## Conventions

This section discusses the conventions used in this guide.

### Text Conventions

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

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

**Table 1: Notes and warnings**

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

**Table 1: Notes and warnings (continued)**

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

**Table 2: Text**

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

**Table 3: Command syntax**

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

## Platform-Dependent Conventions

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

- ExtremeSwitching® switches
- SummitStack™

When a feature or feature implementation applies to specific platforms, the specific platform is noted in the heading for the section describing that implementation in the ExtremeXOS command documentation (see the Extreme Documentation page at www.extremenetworks.com/documentation/). In many cases, although the command is available on all platforms, each platform uses specific keywords. These keywords specific to each platform are shown in the Syntax Description and discussed in the Usage Guidelines sections.

## Terminology

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

# Providing Feedback

The Information Development team at Extreme Networks has made every effort to ensure the accuracy and completeness of this document. We are always striving to improve our documentation and help you work better, so we want to hear from you. We welcome all feedback, but we especially want to know about:

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

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

- In a web browser, select the feedback icon and complete the online feedback form.
- Access the feedback form at https://www.extremenetworks.com/documentation-feedback/.
- Email us at documentation@extremenetworks.com.

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

# Getting Help

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

**Extreme Portal**

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

**The Hub**

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

### Call GTAC

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

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

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

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

1. Go to www.extremenetworks.com/support/service-notification-form.
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4. Select **Submit**.

# Related Publications

## ExtremeXOS Publications

- *ACL Solutions Guide*
- *ExtremeXOS 30.6 Command Reference Guide*
- *ExtremeXOS 30.6 EMS Messages Catalog*
- *ExtremeXOS 30.6 Feature License Requirements*
- *ExtremeXOS 30.6 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 SwitchExtreme Management Center User Guide*

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# Overview

These release notes document ExtremeXOS 30.6, which adds features and resolves software deficiencies.

## Security Information

The following section covers important security information for ExtremeXOS 30.6.

### OpenSSL Version

ExtremeXOS 30.6 uses FIPS openssl-fips-2.0.16.

### Linux Kernel

ExtremeXOS 30.6 uses Linux Kernel 4.14.

## Service Notifications

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

## Upgrading ExtremeXOS

For instructions about upgrading ExtremeXOS software, see "Software Upgrade and Boot Options" in the *ExtremeXOS 30.6 User Guide*.

Beginning with ExtremeXOS 12.1, an ExtremeXOS core image (.xos file) must be downloaded and installed on the alternate (non-active) partition. If you try to download to an active partition, the error message `Error: Image can only be installed to the non-active partition.` appears. An ExtremeXOS modular software package (.xmod file) can still be downloaded and installed on either the active or alternate partition.

## Stacking: Upgrading from ExtremeXOS 30.2 and Earlier

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

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

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

      `use image {`**primary** `|` **secondary**`} slot` *slot-number*
      `reboot slot` *slot-number*

2. Download a new ExtremeXOS software release and install it on all nodes on the active topology using the command: `download [`**url** *url* `{`**vr** *vrname*`} |` image `[`**active** `|` **inactive**`] [[`*hostname* `|` *ipaddress*`]` *filename* `{{`**vr**`}` *vrname*`} {`**block-size** *block_size*`} |` **memorycard** *filename*`] {`*partition*`}`

3. Restart all nodes in the new release using `reboot {[`**time** *mon day year hour min sec*`] |` **cancel**`} {`**slot** *slot-number*`} {`**all**`}`

## Extended Edge Switching Image Download Issue

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

To perform a manual upgrade:

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

For more information about manual upgrades, see the *Manual Upgrading* section in the *Extended Edge Switching Chapter* in the *ExtremeXOS 30.6 User Guide*.

After this one-time upgrade, you can perform all subsequent ExtremeXOS upgrades automatically using the `.lst` file. For more information about automatic upgrades, see the *Automatic Upgrading* section in the *Extended Edge Switching Chapter* in the *ExtremeXOS 30.6 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/*"
```

# Open vSwitch Database Management Protocol (OVSDB) End of Support

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

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

# Default ExtremeXOS® Settings

Table 4 shows the default settings for ExtremeXOS starting with version 22.6, and shows any changes that have been made to these settings and in what version these changes were made.

**Table 4: Default ExtremeXOS Settings**

| ExtremeXOS Feature | ExtremeXOS 22.6 Settings | ExtremeXOS 30.1 Settings | ExtremeXOS 30.2 Settings | ExtremeXOS 30.3 Settings | ExtremeXOS 30.5 Settings | ExtremeXOS 30.6 |
|---|---|---|---|---|---|---|
| Account Lockout | After 3 consecutive login failures, account is locked for 5 minutes. | | | | | |
| 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. | | | | | |
| DHCP | Disabled. | | | | | |
| DNS Cache Resolver and Analytics | N/A. | N/A. | | Disabled. | | |
| IPFIX | Disabled. | | | | | |
| EAPS | Disabled. | | | | | |
| EDP | Enabled. | Enabled on management port. | | | | |
| ELRP | Disabled. | | | | | |
| ESRP | Disabled. | | | | | |

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

**Table 4: Default ExtremeXOS Settings (continued)**

| ExtremeXOS Feature | ExtremeXOS 22.6 Settings | ExtremeXOS 30.1 Settings | ExtremeXOS 30.2 Settings | ExtremeXOS 30.3 Settings | ExtremeXOS 30.5 Settings | ExtremeXOS 30.6 |
|---|---|---|---|---|---|---|
| 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. | | | | | |
| Logging memory buffer | Generate an event when the logging memory buffer exceeds 90% of capacity. | | | | | |
| MAC Security | N/A | Disabled. | | | | |
| MLD | Disabled. | | | | | |
| MLD Snooping | Disabled. | | | | | |
| MPLS | Disabled. | | | | | |
| MSRP | Disabled. | | | | | |
| MSTP | Enabled. | | | | | |
| NetLogin | All types of authentication are disabled. | | | | | |
| NTP | Disabled. | | | | | |
| ONEPolicy | Disabled. | | | | | |

**Table 4: Default ExtremeXOS Settings (continued)**

| ExtremeXOS Feature | ExtremeXOS 22.6 Settings | ExtremeXOS 30.1 Settings | ExtremeXOS 30.2 Settings | ExtremeXOS 30.3 Settings | ExtremeXOS 30.5 Settings | ExtremeXOS 30.6 |
|---|---|---|---|---|---|---|
| Policy rule model | | | | | Access list (Unless upgrading to 30.5 with existing policy rules configuration, then the default is hierarchical.) | Hierarchical (Unless upgrading from 30.5 with a saved configuration set to access list.) |
| OpenFlow | Disabled. | | | | Not supported. | |
| OSPF | Disabled. | | | | | |
| OVSDB | Disabled. | | | | Not supported. | |
| Passwords | Plain text password entry not allowed. | | | | | |
| PIM | Disabled. | | | | | |
| PIM Snooping | Disabled. | | | | | |
| PoE<br>Fast PoE<br>Perpetual PoE | Enabled.<br>N/A.<br>N/A. | | | Enabled.<br>Disabled.<br>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. | | | | | |

**Table 4: Default ExtremeXOS Settings (continued)**

| ExtremeXOS Feature | ExtremeXOS 22.6 Settings | ExtremeXOS 30.1 Settings | ExtremeXOS 30.2 Settings | ExtremeXOS 30.3 Settings | ExtremeXOS 30.5 Settings | ExtremeXOS 30.6 |
|---|---|---|---|---|---|---|
| SSH | Disabled. | | | | | |
| Stacking support | Disabled, except for X450-G2. | — | Disabled, except for X450-G2, X465. | — | — | |
| Stacking auto-discovery | N/A. | N/A. | | Enabled. | | |
| STP | Enabled. | | | | | |
| Syslog | Disabled. | | | | | |
| TACACS | Disabled. | | | | | |
| Telnet | Disabled. | | | | | |
| VPLS | All newly created VPLS instances are enabled. | | | | | |
| Watchdog | Enabled. | | | | | |
| Web HTTP server | Disabled. | | | | | |

# New and Corrected Features in ExtremeXOS 30.6

The following new and corrected features are supported in the 30.6 software:

## Extended Edge Switching Optimized IP Multicast Replication

Previously, a controlling bridge (CB) had to send separate copies of IP multicast traffic to each receiver. Now the CB only sends one copy of the IP multicast traffic per receiver VLAN for a particular IP multicast group. For example, if group 225.0.0.1 has five receivers in VLAN v1 and four receivers in VLAN v2, the CB sends one copy to VLAN v1 and one copy to VLAN v2 and the bridge port extender (BPE) does the replication.

*Supported Platforms*

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

*Limitations*

Using optimized IP multicast reduces the number of VLANs with extended ports to 3,000.

*New CLI Commands*

configure **forwarding vpex ipmc replication** [ **controlling-bridge** | **bpe** ]

*Changed CLI Commands*

The following show command now displays IP multicast replication information:

```
show forwarding configuration
```

## Option 66 and 67 Support for Zero Touch Provisioning (ZTP)

Starting with ExtremeXOS 30.6, option 66 and option 67 for Zero Touch Provisioning (ZTP) are supported, which provide TFTP server and `bootpfilename` for cases when option 43 is not available.

*Supported Platforms*

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

## OSPFv2 Auto-peering

ExtremeXOS 30.6 introduces OSPFv2 auto-peering, which is a network of cooperating interconnected devices that automatically create an OSPFv2 network for any topology, providing fully redundant, multipath routing. Node participation grows dynamically and is not bound to any well known topology such as Clos or Leaf/Spine. OSPF is a link-state routing protocol providing fast convergence and scalability.

> **Note**
> BGP and OSPFv2 Auto-peering are mutually exclusive. Only one form of Auto-peering can exist at a time.

*Supported Platforms*

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

*Limitations*

The following capabilities are not supported on OSPFv2 Auto-peering:
- Stacking
- Automatic LAG configuration with MLAG
- Automatic LAG configuration with Extended Edge Switching
- Static Lag attachments to AutoOSPF
- AutoOSPF links on Extended Edge Switching ports
- MPLS, VPLS, L2VPN, L3VPN
- PIM snooping, PIM-SM, PIM-DM, SSM mode
- OSPFv2, OSPFv3, ISIS, RIP, RIPNG per VRF
- Automatic MLAG configuration
- Multiple links between two OSPFv2 auto-peering enabled switches (instead LAG can be configured to avoid connectivity problem due to link failure).

Other limitations:
- One MLAG peer per node.

- Static router must be an external router per VRF.
- VLANs spanning multiple bridges, where each bridge is automatic configured LAG-connected, must be VXLAN-based or replaced with MLAG.

*New CLI Commands*

```
create auto-peering ospf routerid ipaddress
```

*Changed CLI Commands*

Changes are underlined.

```
show auto-peering {bgp | ospf}
```

The following command now deletes OSPFv2 Auto-peering, as well as BGP Auto-peering:

```
delete auto-peering
```

## Push Button Automatic Stacking for ExtremeSwitching X465 Series Switches

This feature is aimed at zero-touch customers who want to deploy stacking in remote sites. You can now ship switches to remote sites and have a local (non-technical) installer mount the switches in the rack, attach the power cables, and connect the stacking cables. The installer will then press the mode button to initiate the automatic stacking sequence. After stacking is complete, the switches can be provisioned and managed remotely using a cloud connection. You can set up stacks of 1 to 8 nodes.

*Supported Platforms*

ExtremeSwitching X465 series switches.

*Limitations*

The following are limitations of this feature:

- To use automatic stacking, each switch must have the factory default configuration.
- License mismatches due to installing feature licenses cannot be resolved automatically. The applicable node is left in the failed state.
- Extended Edge Switching is not supported.

## Insight for Guest Virtual Machines Supports Stacking

Insight for Guest Virtual Machines (VMs) supports stacking in ExtremeXOS 30.6.

*Supported Platforms*

ExtremeSwitching X465-24MU, X465-24MU-24W, X465i-48W, and X465-24XE switches; and X695 series switches.

*Limitations*

The VMs do not migrate to backup with a failover. To access your VMs again, restore the original master as master.

*Changed CLI Commands*

Changes are underlined.

```
create vm vm_name image image_file {memory memory_size} {cpus num_cpus}
{slot slot_ID}{vnc [none | vnc_display]}
```

```
create vm vm_name ova ova_file {memory memory_size} {cpus num_cpus}
{slot slot_ID} {vnc [none | vnc_display]}
```

## Federal Information Processing Standards (FIPS) Compliance Updates

For ExtremeXOS 30.6, the following changes have been made pertaining to Federal Information
Processing Standards (FIPS):

- The FIPS object module is changed from openssl-fips-ecp-2.0.16 to openssl-fips-2.0.16.
- Oracle FIPS Object Module patch applied to openssl-fips-2.0.16.

*Supported Platforms*

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

## Network Time Protocol (NTP) Supports Federal Information Processing Standards (FIPS) Mode

When FIPS mode is enabled, Network Time Protocol (NTP) uses OpenSSL Federal Information
Processing Standards (FIPS) library and supports only FIPS-compliant algorithms for authentication
(SHA-256 authentication only). MD5 key configuration support is not available when FIPS mode is
enabled, and existing MD5 key configurations are removed when FIPS mode comes into effect.

*Supported Platforms*

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

*Changed CLI Commands*

The following command now does not allow the **md5** option when FIPS mode is on:

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

## New Command to Install LRM/MACsec Adapter PHY Firmware

ExtremeXOS 30.6 introduces a new command to install new port (PHY) firmware for LRM/MACsec
adapter ports.

If a warning message in the log indicates that LRM/MACsec adapter port firmware is out-of-date, you
can use this new command to update the firmware.

*Supported Platforms*

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

*New CLI Commands*

```
install firmware {{force} {slot slot_number} | lrm-macsec-adapter ports
[port_list | all]}
```

## Fabric Attach Changes

ExtremeXOS 30.6 introduces two changes to the Fabric Attach feature:

- The specified VLAN configuration on the Fabric Attach server is restricted to only tagged VLANs.
- You can configure whether or not Fabric Attach proxy switches send Management VLAN data to clients.

*Supported Platforms*

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

*Changed CLI Commands*

Changes are underlined.

```
configure fabric attach management-vlan [vlan_id | vlan_name | untagged
| none | forward [on | off] ]
```

The following show command now shows information about whether or not Fabric Attach proxy switches send Management VLAN data to clients.

```
show fabric attach agent
```

## Enhancement to Technical Support Feature

This feature enhances the current `show tech-support` command (see below) by providing a way to run debug bundles, which are JSON files with predefined modules to common problems that you can run when an issue occurs. You can search for a bundle that best matches your issue, and then execute that relevant bundle that matches your problem.

The `debug_bundle.json` file is developed on a regular basis outside of ExtremeXOS releases, providing continuous improvement to the feature.

*Supported Platforms*

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

*Changed CLI Commands*

Changes are underlined.

```
show tech-support {all | area | {{bundle bundle_name} {monitor
num_iterations} {interval seconds}} {detail} {logto [file]}
```

## Demonstration Features

The following features are demonstration features that are provided for testing purposes. Demonstration features are for lab use only and are not for use in a production environment. Please work with your Extreme Networks sales team to request a demonstration.

*Ethernet Virtual Private Network (EVPN) Type 5 Routes Supported*

For Ethernet Virtual Private Network (EVPN), Type 5 Routes are now supported, except for on the default VR.

> **Important**
> Demo Feature: EVPN Type 5 Routes is a demonstration feature that is provided for testing purposes. Demonstration features are for lab use only and are not for use in a production environment. Please work with your Extreme Networks sales team to request a demonstration.

**Supported Platforms**

ExtremeSwitching X465, X590, X690, X695 series switches.

**Limitations**

The following are not supported:

- Switching through a VXLAN tunnel to a remote L3 Anycast gateway.
- Default VRs.

> **Note**
> By default, when a peer is created, the following line appears in the BGP configuration:
>
> enable bgp **neighbor** *neighbor_ip* **address-family l2vpn-evpn next-hop-unchanged**
>
> This is harmless if L2VPN EVPN is not enabled for the peer. However, it is required if the L2VPN EVPN capability is enabled for a peer. The default for this capability and address family will be changed to enabled in a subsequent release.

**New CLI Commands**

configure **bgp evpn l3vni** [*vni_value* | **none**] **vr** *vr_name*

show **bgp evpn l3vni** {**vr** *vr_name*}}

enable **bgp export** [**static** | **direct**] {**address-family** *address_family*} **l2vpn-evpn** {**vr** *vr_name*}

disable **bgp export** [**static** | **direct**] {**address-family** *address_family*} **l2vpn-evpn** {**vr** *vr_name*}

**Changed CLI Commands**

Changes are underlined.

show bgp routes {**address-family** [**ipv4-unicast** | **ipv4-multicast** |**ipv6-unicast** | **ipv6-multicast** | **ipv4-vxlan** | {**l2vpn-evpn** [**inclusive-multicast** | **mac-ip** | **auto-discovery** | **esi** | <u>**ip-prefix**</u>]}]} {**detail**} [**ipv4-vxlan** |

**all** | **as-path** *path-expression* | **community** [**no-advertise** | **no-export** |
**no-export-subconfed** | **number** *community_number* | *autonomous-system-idbgp-*
*community*] | **network** [**any/***netMaskLen* | *networkPrefixFilter*] {**exact**}] {**vr**
*vr_name*}

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** | **ip-prefix**]}]}
[**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**}]

*IP and MAC Anycast*

This feature enables you to configure the anycast gateway MAC to be used by VLANs that enable IP anycast. You can specify the same IP address and MAC address on all edge technology devices, which allows seamless IP mobility in the network for edge devices.

> **Important**
> Demo Feature: The IP and MAC Anycast feature is a demonstration feature that is provided for testing purposes. Demonstration features are for lab use only and are not for use in a production environment. Please work with your Extreme Networks sales team to request a demonstration.

**Supported Platforms**

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

**Limitations**

Switching through a VXLAN tunnel to a remote L3 Anycast gateway is not supported.

**New CLI Commands**

configure **ip anycast mac** [**none** | *mac*]

enable **ip anycast** {**vlan**} *vlan_name*

disable **ip anycast** {**vlan**} *vlan_name*

**Changed CLI Command**

The following show commands are changed to display IP Anycast information:

show vlan

show ipconfig {**ipv4**} {**vlan** *vlan_name*}

show ipconfig ipv6 {**vlan** *vlan_name* | **tunnel** *tunnel_name*}

# New Hardware Supported in ExtremeXOS 30.6

The following new hardware is supported in ExtremeXOS 30.6:

**Table 5: ExtremeSwitching X695 Series Switches**

| ExtremeSwitching X695-48Y-8C | 48 1/10/25Gb SFP28 ports, 8 40/100G QSFP28 ports, unpopulated. ExtremeXOS Advanced Edge License, 2 unpopulated power supply slots, 6 unpopulated fan module slots. |
|---|---|

**Table 6: Extended Edge Switching V300 Bridge Port Extenders (BPE) Models**

| V300-8P-2X | 8 10/100/1000BASE-T POE+ ports half/full duplex, 2 × SFP+ ports, fanless. |
|---|---|
| V300-8T-2X | 8 10/100/1000BASE-T ports half/full duplex, 2 × SFP+ ports, fanless. |
| V300HT-8P-2X | 8 10/100/1000BASE-T POE+ ports half/full duplex, 2 × SFP+ ports, fanless, high temperature model. |
| V300HT-8T-2X | 8 10/100/1000BASE-T ports half/full duplex, 2 × SFP+ ports, fanless, high temperature model. |

**Note**

The V300 BPEs support cascading (except the V300-8P-2T-W, which must be connected directly to the controlling bridge to receive PoE power), but not rings.

# ExtremeCloud™ IQ Agent Supported

ExtremeXOS 30.6 provides support for ExtremeCloud IQ. This release supports device discovery, basic monitoring, using SSH to connect to devices, and the ability to update the ExtremeCloud IQ Agent and the ExtremeXOS image from ExtremeCloud IQ.

For more information about ExtremeCloud IQ, go to https://www.extremenetworks.com/extremecloud-iq/

## Supported Platforms

ExtremeSwitchingX435, X440-G2, X450-G2, X460-G2, X465 series switches.

# 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 30.6 is compatible with the version of Extreme Management Center as shown in this table:
http://emc.extremenetworks.com/content/common/releasenotes/extended_firmware_support.htm

## Supported MIBs

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

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

For detailed information on which MIBs and SNMP traps are supported, see the *Extreme Networks Proprietary MIBs* and *MIB Support Details* sections in the *ExtremeXOS 30.6 User Guide*.

## Tested Third-Party Products

The following third-party products have been tested for ExtremeXOS 30.6.

### 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

# Limits

This chapter summarizes the supported limits in ExtremeXOS 30.6.

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

- Supported Limits for Value Edge License
- Supported Limits for Edge License
- Supported Limits for Advanced Edge License
- Supported Limits for Core License

For more information about licenses, see *ExtremeXOS 30.6 Feature License Requirements*.

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

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

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

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

# Supported Limits for Value Edge License

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

**Table 7: Supported Limits for Value Edge License**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

| Metric | Product | Limit |
|---|---|---|
| **VLANs (Layer 3)**—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs. | ExtremeSwitching X435 | IPv4: 30 IPv6: 15 |
| **VLANs (maximum active port-based)**—maximum active ports per VLAN when 1,000 VLANs are configured with default license. | ExtremeSwitching X435 | 28 |
| **VLAN Port Interfaces (VPIF)**—maximum number of VLAN port interfaces. | ExtremeSwitching X435 | 38,400 |
| **VLANs (maximum active protocol-sensitive filters)**—number of simultaneously active protocol filters in the switch. | ExtremeSwitching X435 | 16 |
| **VLAN translation**—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN. | ExtremeSwitching X435 | 15 |
| **VLAN translation**—maximum number of translation VLAN pairs with an IP address on the translation VLAN. **Note:** This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports. | ExtremeSwitching X435 | 15 |
| **VLAN translation**—maximum number of translation VLAN pairs in an L2-only environment. | ExtremeSwitching X435 | 15 |
| **XML requests**—maximum number of XML requests per second. **Note:** Limits are dependent on load and type of XML request. These values are dynamic ACL data requests. | ExtremeSwitching X435 | 10 with 100 DACLs |

# Supported Limits for Edge License

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

**Table 8: Supported Limits for Edge License**

| Metric | Product | Limit |
|---|---|---|
| AAA (local)—maximum number of admin and local user accounts. | All platforms, except X435 | 16 |
| Access lists (meters)—maximum number of meters. | ExtremeSwitching X620, X440-G2 | 1,024 ingress 256 egress |
|  | ExtremeSwitching X670-G2, X450-G2, X460-G2 | 1,024 ingress 512 egress |
|  | ExtremeSwitching X870, X690, X590, X465 | 2,048 ingress 512 egress |
|  | ExtremeSwitching X695 | 6,000 ingress 2,000 egress |
| Access lists (policies)—suggested maximum number of lines in a single policy file. | All platforms, except X435 | 300,000 |
| Access lists (policies)—maximum number of rules in a single policy file.[a] | ExtremeSwitching X460-G2, X450-G2, X670-G2 | 4,096 ingress 1,024 egress |
|  | ExtremeSwitching X620, X440-G2 | 2,048 ingress 512 egress |
|  | ExtremeSwitching X870 | 3,072 ingress 1,024 egress |
|  | ExtremeSwitching X690, X590, X465, X695 | 8,192 ingress 1,024 egress |
| Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP). | ExtremeSwitching X450-G2, X460-G2 | 2,048 ingress only |
|  | ExtremeSwitching X670-G2, X870, X690, X695 | 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. | ExtremeSwitching X460-G2, X450-G2 | 16 ingress 4 egress |
|  | ExtremeSwitching X670-G2, X690, X590, X465, X695 | 12 ingress 4 egress |
|  | ExtremeSwitching X440-G2, X620 | 8 ingress 4 egress |
|  | ExtremeSwitching X870 | 4 ingress 4 egress |
| Access lists (slices)—number of ACL slices in first stage (VFP). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X465, X620, X440-G2, X870, X690, X590, X695 | 4 ingress only |

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

| Metric | Product | Limit |
|---|---|---|
| ACL Per Port Meters—number of meters supported per port. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 16 |
| ACL port ranges. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 32 |
| Meters Packets-Per-Second Capable. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | Yes |
| AVB (audio video bridging)—maximum number of active streams. | ExtremeSwitching X450-G2, X460-G2, X620, X440-G2 | 1,024 |
| | ExtremeSwitching X670-G2 | 4,096 |
| | ExtremeSwitching X590, X690, X870, X695 | N/A |
| BFD sessions (Software Mode)—maximum number of BFD sessions. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 (default timers—1 sec) | 512 |
| | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 (minimal timers—100 msec) | 10 [c] |
| BFD IPv4 sessions (Hardware Assisted)—maximum number of IPv4 BFD sessions. | ExtremeSwitching X460-G2, X870, X690, X590, X465, X695 | 900 (PTP not enabled) 425 (PTP enabled) 256 (with 3 ms transmit interval) |
| BFD IPv6 sessions (Hardware Assisted)—maximum number of IPv6 BFD sessions. | ExtremeSwitching X460-G2, X870, X690, X590, X465, X695 | 425 (PTP not enabled) |
| BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per virtual router. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2 , X465, X620, X870, X690, X590, X695 | 8 |
| BOOTP/DHCP relay—maximum number of BOOTP or DHCP servers per VLAN. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X465, X620, X870, X690, X590, X695 | 8 |
| BOOTP/DHCP relay—maximum number of DHCPv4/v6 relay agents | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2 , X465, X620, X870, X690, X590, X695 | 4,000 |
| Connectivity fault management (CFM)—maximum number or CFM domains. Note: With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 8 |

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

| Metric | Product | Limit |
|---|---|---|
| **CFM**—maximum number of CFM associations.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 256 |
| **CFM**—maximum number of CFM up end points.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 32 |
| **CFM**—maximum number of CFM down end points.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695<br><br>ExtremeSwitching X460-G2 | 32<br><br>256 (non-load shared ports)<br>32 (load shared ports) |
| **CFM**—maximum number of CFM remote end points per up/down end point.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 2,000 |
| **CFM**—maximum number of dot1ag ports.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 128 |
| **CFM**—maximum number of CFM segments.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 1,000 |
| **CFM**—maximum number of MIPs.<br><br>**Note:** With Advanced Edge license or higher. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 256 |
| **CLEAR-Flow**—total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs. | ExtremeSwitching X460-G2, X670-G2, X450-G2<br>ExtremeSwitching X440-G2, X620<br>ExtremeSwitching X870<br>ExtremeSwitching X690, X590, X465, X695 | 4,094<br>1,024<br>3,072<br>8,192 |

**Table 8: 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. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 8 |
| DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 256 (with underlying protocol RIPng) 128 (with underlying protocol OSPFv3) 1,024 (with static routes) |
| DHCP snooping entries—maximum number of DHCP snooping entries. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 2,048 |
| Dynamic ACLs—maximum number of ACLs processed per second.<br><br>Note: Limits are load-dependent. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695<br><br>   with 50 DACLs<br>   with 500 DACLs | <br><br>10<br>5 |
| EAPS domains—maximum number of EAPS domains.<br><br>Note: An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains.<br><br>Note: You can increase the number of domains by upgrading to the Advanced Edge license. | ExtremeSwitching X670-G2, X450-G2, X460-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 4 |
| EAPSv1 protected VLANs—maximum number of protected VLANs. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2<br><br>ExtremeSwitching X870, X690, X590, X465, X695 | 1,000<br><br>2,000 |
| ERPS domains—maximum number of ERPS domains with or without CFM configured.<br><br>Note: You can increase the number of domains by upgrading to the Advanced Edge license. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 4 |
| ERPSv1 protected VLANs—maximum number of protected VLANs. | ExtremeSwitching X870, X690, X590, X465, X695<br><br>ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2 | 2,000<br><br>1,000 |

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

| Metric | Product | Limit |
|---|---|---|
| ERPSv2 protected VLANs—maximum number of protected VLANs. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690 , X590, X465, X695 | 2,000 |
| | ExtremeSwitchingX620, X440-G2 | 500 |
| ELSM (vlan-ports)—maximum number of VLAN ports. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590 , X465, X695 | 5,000 |
| | ExtremeSwitching X440-G2 | 4,000 |
| Extended Edge Switching maximum BPEs—maximum number of attached bridge port extenders (BPEs). | ExtremeSwitching X465, X590, X670-G2, X690 | 48 |
| Extended Edge Switching maximum cascade ports—maximum number of upstream ports on bridge port extenders (BPEs). | ExtremeSwitching X465, X590, X670-G2, X690 | 2 on V400-24 and V300 models 4 on V400-48 models |
| Extended Edge Switching maximum tiers—maximum number of cascade levels (tiers) of bridge port extenders (BPEs). | ExtremeSwitching X465, X590, X670-G2, X690 | 4 (except for V300-8P-2T-W, which support 1 tier) |
| Extended Edge Switching maximum ring BPEs—maximum number of bridge port extenders (BPEs) in a ring topology. | ExtremeSwitching X465, X590, X670-G2, X690 | 8 |
| Extended Edge Switching VLAN+ port memberships—maximum number of VLAN+ (extended) port memberships. | ExtremeSwitching X465, X590, X670-G2, X690 | 12,000 in hash mode (default) 131,000 in port-group mode |
| Forwarding rate—maximum L3 software forwarding rate. | ExtremeSwitching X690, X590, X465, X695 | 30,000 pps |
| | ExtremeSwitching X870 | 32,000 pps |
| | ExtremeSwitching X450-G2 | 16,000 pps |
| | ExtremeSwitching X460-G2 | 17,000 pps |
| | ExtremeSwitching X620 | 10,000 pps |
| | ExtremeSwitching X670-G2 | 15,000 pps |
| | ExtremeSwitching X440-G2 | 9,000 pps |

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

| Metric | Product | Limit |
|---|---|---|
| FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries. | ExtremeSwitching X460-G2 | 49,152 [f] |
| | ExtremeSwitching X670-G2 | 294,912 [f] |
| | ExtremeSwitching X450-G2 | 34,816 [f] |
| | ExtremeSwitching X620, X440-G2 | 16,384 [f] |
| | ExtremeSwitching X870 | 139,264 [f] |
| | ExtremeSwitching X690, X590, X465 | 278,528 [f] |
| | ExtremeSwitching X695 | 294,912 [f] |
| FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries. | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | 1,024 |
| | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 4,096 |
| FDB (maximum L2 entries)—maximum number of MAC addresses. | ExtremeSwitching X460-G2 | 98,300 [g] |
| | ExtremeSwitching X670-G2 | 294,912 [g] |
| | ExtremeSwitching X450-G2 | 68,000 [g] |
| | ExtremeSwitching X620, X440-G2 | 16,384 |
| | ExtremeSwitching X870 | 139,264 [g] |
| | ExtremeSwitching X690, X590, X465, X695 | 278,528 [g] |
| | ExtremeSwitching X695 | 294,912 [g] |
| FDB (maximum L2 entries)—maximum number of multicast FDB entries. | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 4,096 |
| | ExtremeSwitching X450-G2, X460-G2, X620, X440-G2 | 1,024 |
| Identity management—maximum number of Blacklist entries. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 512 |
| Identity management—maximum number of Whitelist entries. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 512 |
| Identity management—maximum number of roles that can be created. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 64 |
| Identity management—maximum role hierarchy depth allowed. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 5 |
| Identity management—maximum number of attribute value pairs in a role match criteria. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 16 |
| Identity management—maximum number of child roles for a role. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| Identity management—maximum number of policies/dynamic ACLs that can be configured per role. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |

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

| Metric | Product | Limit |
|---|---|---|
| **Identity management**—maximum number of LDAP servers that can be configured. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| **Identity management**—maximum number of Kerberos servers that can be configured. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 20 |
| **Identity management**—maximum database memory size. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 512 |
| **Identity management**— recommended number of identities per switch.<br><br>**Note:** Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 100 |
| **Identity management**— recommended number of ACL entries per identity.<br><br>**Note:** Number of ACLs per identity, based on system ACL limitation. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 20 |
| **Identity management**—maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 500 |
| **IGMP snooping per VLAN filters**— maximum number of VLANs supported in per-VLAN IGMP snooping mode. | ExtremeSwitching X460-G2, X870 | 1,500 |
| | ExtremeSwitching X450-G2 | 2,048 |
| | ExtremeSwitching X670-G2 , X695 | 2,000 |
| | ExtremeSwitching X620, X440-G2 | 1,000 |
| | ExtremeSwitching X690, X590, X465 | 4,000 |
| **IGMPv1/v2 SSM-map entries**— maximum number of IGMPv1/v2 SSM mapping entries. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 500 |
| **IGMPv1/v2 SSM-map entries**— maximum number of sources per group in IGMPv1/v2 SSM mapping entries. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 50 |
| **IGMPv2 subscriber**—maximum number of IGMPv2 subscribers per port.[n] | ExtremeSwitching X670-G2, X460-G2, X450-G2 | 4,000 |
| | ExtremeSwitching X440-G2, X620 | 3,500 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 4,000 |

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

| Metric | Product | Limit |
|---|---|---|
| **IGMPv2 subscriber**—maximum number of IGMPv2 subscribers per switch.[n] | ExtremeSwitching X670-G2 | 30,000 |
| | ExtremeSwitching X460-G2, X450-G2 | 20,000 |
| | ExtremeSwitching X620, X440-G2 | 17,500 |
| | ExtremeSwitching X465, X870, X690, X590, X695 | 45,000 |
| **IGMPv3 maximum source per group**—maximum number of source addresses per group. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X770, X620, X440-G2, X870, X690, X590, X465, X695 | 250 |
| **IGMPv3 subscriber**—maximum number of IGMPv3 subscribers per port.[n] | ExtremeSwitching X670-G2, X460-G2, X450-G2 | 4,000 |
| | ExtremeSwitching X440-G2, X620 | 3,500 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 4,000 |
| **IGMPv3 subscriber**—maximum number of IGMPv3 subscribers per switch.[n] | ExtremeSwitching X460-G2, X450-G2 | 20,000 |
| | ExtremeSwitching X670-G2 | 30,000 |
| | ExtremeSwitching X620, X440-G2 | 17,500 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 45,000 |
| **IP ARP entries in software**— maximum number of IP ARP entries in software.<br><br>**Note:** Might be limited by hardware capacity of FDB (maximum L2 entries). | ExtremeSwitching X670-G2 | 131,072 (up to)[h] |
| | ExtremeSwitching X460-G2 | 57,344 (up to)[h] |
| | ExtremeSwitching X450-G2 | 47,000 (up to)[h] |
| | ExtremeSwitching X440-G2, X620 | 20,480 |
| | ExtremeSwitching X870 | 94,206 (up to)[h] |
| | ExtremeSwitching X690, X590, X465 | 157,694 (up to)[h] |
| | ExtremeSwitching X695 | 184,318 (up to)[h] |

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

| Metric | Product | Limit |
|---|---|---|
| IPv4 ARP entries in hardware with minimum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. Assumes number of IP route reserved entries is 100 or less. | ExtremeSwitching X870 | 74,000 (up to)[h] |
| | ExtremeSwitching X460-G2 | 50,000 (up to)[h] |
| | ExtremeSwitching X670-G2 | 108,000 (up to)[h] |
| | ExtremeSwitching X450-G2 | 39,000 (up to)[h] |
| | ExtremeSwitching X620 | 1,500 |
| | ExtremeSwitching X440-G2 | 1,000 |
| | ExtremeSwitching X690, X590, X465 | 119,000 (up to) [h] |
| | ExtremeSwitching X695 | 46,000 (up to) [h] |
| IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is "maximum." | ExtremeSwitching X870 | 64,000 (up to)[h] |
| | ExtremeSwitching X460-G2 | 43,000 (up to)[h] |
| | ExtremeSwitching X670-G2 | 98,000 (up to)[h] |
| | ExtremeSwitching X450-G2 | 29,000 (up to)[h] |
| | ExtremeSwitching X620 | 1,500 |
| | ExtremeSwitching X440-G2 | 1,000 |
| | ExtremeSwitching X690, X590, X465 | 109,000 (up to) [h] |
| | ExtremeSwitching X695 | 125,000 (up to) [h] |
| IP flow information export (IPFIX)—number of simultaneous flows. | ExtremeSwitching X460-G2 | 2,048 ingress 2,048 egress |
| | ExtremeSwitching X450-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | N/A |

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

| Metric | Product | Limit |
|---|---|---|
| **IPv4 remote hosts in hardware with zero LPM routes**—maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less. | ExtremeSwitching X870 | 120,000 (up to)[h] |
| | ExtremeSwitching X460-G2 | 73,000[h] |
| | ExtremeSwitching X670-G2 | 176,000 (up to)[h] |
| | ExtremeSwitching X450-G2 | 61,000 (up to)[h] |
| | ExtremeSwitching X440-G2, X620 | 3,500 |
| | ExtremeSwitching X690, X590, X465 | 216,000 (up to) [h] |
| | ExtremeSwitching X695 | 241,000 (up to) [h] |
| **IPv4 routes**—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols. | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | 25,000 |
| | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 131,000 |
| **IPv4 routes (LPM entries in hardware)**— number of IPv4 routes in hardware. | ExtremeSwitching X460-G2 | 12,000 |
| | ExtremeSwitching X450-G2 | 16,000 |
| | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 131,000 [q] |
| | ExtremeSwitching X620, X440-G2 | 480 |
| **IPv6 6in4 tunnel**—maximum number of IPv6 6in4 tunnels. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 255 |
| | ExtremeSwitching X440-G2, X620 | N/A |
| **IPv6 6to4 tunnel**—maximum number of IPv6 6to4 tunnels. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 1 (per virtual router) |
| | ExtremeSwitching X440-G2, X620 | N/A |
| **IPv6 addresses on an interface**—maximum number of IPv6 addresses on an interface. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 255 |
| **IPv6 addresses on a switch**—maximum number of IPv6 addresses on a switch. | ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695 | 2,048 |
| | ExtremeSwitching X620, X440-G2 | 510 |

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

| Metric | Product | Limit |
|---|---|---|
| IPv6 host entries in hardware— maximum number of IPv6 neighbor entries in hardware. | ExtremeSwitching X670-G2 | 36,750 [h] |
|  | ExtremeSwitching X460-G2 | 22,000 [h] |
|  | ExtremeSwitching 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] |
|  | ExtremeSwitching X695 | 57,000 [h] |
| IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols. | ExtremeSwitching X450-G2, X460-G2, X620, X440-G2 | 25,000 |
|  | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 65,000 [q] |
| IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware. | ExtremeSwitching X460-G2 | 6,000 |
|  | ExtremeSwitching X450-G2 | 8,000 |
|  | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 65,000 [q] |
|  | ExtremeSwitching X620, X440-G2 | 240 |
| IPv6 routes with a mask greater than 64 bits in hardware— maximum number of such IPv6 LPM routes in hardware. | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 8,192 [r] |
|  | ExtremeSwitching X440-G2, X620 | 1,024 |
|  | ExtremeSwitching X450-G2, X460-G2 | 2,048 |
| IPv6 route sharing in hardware— route mask lengths for which ECMP is supported in hardware. | ExtremeSwitching X460-G2, X450-G2, X620 | 0–64 >64 single path only |
|  | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 0–128 [r] |
|  | ExtremeSwitching X440-G2 | Not supported |
| IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695 | 2,048 |
|  | ExtremeSwitching X620, X440-G2 | 510 |
| IP multicast static routes— maximum number of permanent multicast IP routes. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695 | 1,024 |
| IP unicast static routes—maximum number of permanent IP unicast routes. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695 | 1,024 |
|  | ExtremeSwitching X620, X440-G2 | 480 |

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

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

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

| Metric | Product | Limit |
|---|---|---|
| IP route sharing (total combinations of gateway sets)— maximum number of combinations of sets of adjacent gateways used by multipath OSPF, BGP, IS-IS, or static routes. | ExtremeSwitching X670-G2<br><br>if maximum gateways is 2<br>if maximum gateways is 4<br>if maximum gateways is 8<br>if maximum gateways is 16 (default)<br>if maximum gateways is 32<br>if maximum gateways is 64 | <br><br>1,022<br>1,022<br>1,022<br>1,022<br>510<br>254 |
| | ExtremeSwitching X460-G2, X450-G2<br><br>if maximum gateways is 2<br>if maximum gateways is 4<br>if maximum gateways is 8<br>if maximum gateways is 16 (default)<br>if maximum gateways is 32<br>if maximum gateways is 64 | <br><br>1,022<br>1,022<br>510<br>254<br>126<br>62 |
| | ExtremeSwitching X620<br><br>if maximum gateways is 2<br>if maximum gateways is 4<br>if maximum gateways is 8<br>if maximum gateways is 16 (default)<br>if maximum gateways is 32<br>if maximum gateways is 64 | <br><br>126<br>126<br>126<br>126<br>62<br>30 |
| | ExtremeSwitching X690, X590, X465, X695<br><br>if maximum gateways is 2<br>if maximum gateways is 4<br>if maximum gateways is 8<br>if maximum gateways is 16 (default)<br>if maximum gateways is 32<br>if maximum gateways is 64<br><br>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 30.6 User Guide*. | <br><br>4,094<br>4,094<br>2,046<br>1,022<br>510<br>254 |
| | ExtremeSwitching X870<br><br>if maximum gateways is 2<br>if maximum gateways is 4<br>if maximum gateways is 8 | <br><br>2,046<br>2,046<br>2,046 |

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

| Metric | Product | Limit |
|---|---|---|
| | if maximum gateways is 16 (default)<br>if maximum gateways is 32<br>if maximum gateways is 64 | 1,022<br>510<br>254 |
| | ExtremeSwitching X440-G2 | N/A |
| **IP multinetting (secondary IP addresses)**—maximum number of secondary IP addresses per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 255 |
| **Jumbo frames**—maximum size supported for jumbo frames, including the CRC. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 9,216 |
| **L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch**—maximum number of VCCV enabled VPLS VPNs. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465 | 16 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |
| **L2 VPN: VPLS MAC addresses**—maximum number of MAC addresses learned by a switch. | ExtremeSwitching X670-G2, X690, X590, X465 | 140,000 |
| | ExtremeSwitching X460-G2 | 55,000 |
| | ExtremeSwitching X870 | 65,000 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |
| **L2 VPN: VPLS VPNs**—maximum number of VPLS virtual private networks per switch. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465 | 1,023 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |
| **L2 VPN: VPLS peers**—maximum number of VPLS peers per VPLS instance. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465 | 64 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |
| **L2 VPN: LDP pseudowires**—maximum number of pseudowires per switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465 | 7,000 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |
| **L2 VPN: static pseudowires**—maximum number of static pseudowires per switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465 | 7,000 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |
| **L2 VPN: Virtual Private Wire Service (VPWS) VPNs**—maximum number of virtual private networks per switch. | ExtremeSwitching X670-G2, X870, X690, X590, X465 | 4,090 |
| | ExtremeSwitching X460-G2 | 1,023 |
| | ExtremeSwitching X450-G2, X620, X440-G2, X695 | N/A |

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

| Metric | Product | Limit |
|---|---|---|
| **Layer-2 IPMC forwarding caches**—(IGMP/MLD/PIM snooping) in mac-vlan mode.<br><br>**Note:**<br>• The internal lookup table configuration used is "l2-and-l3".<br>• IPv6 and IPv4 L2 IPMC scaling is the same for this mode.<br>• Layer-2 IPMC forwarding cache limits—(IGMP/MLD/PIM snooping) in mixed-mode are the same. | ExtremeSwitching X670-G2, X695 | 73,000 |
| | ExtremeSwitching X460-G2 | 24,000 |
| | ExtremeSwitching X450-G2 | 14,000 |
| | ExtremeSwitching X620, X440-G2 | 5,000 |
| | ExtremeSwitching X870 | 36,000 |
| | ExtremeSwitching X690, X590, X465 | 67,000 |
| **Layer-3 IPv4 Multicast**—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled).<br><br>**Note:**<br>• Limit value is the same for MVR senders, PIM Snooping entries. PIM SSM cache, IGMP senders, PIM cache.<br>• The internal lookup table configuration used is "more l3-and-ipmc".<br>• Assumes source-group-vlan mode as look up key.<br>• Layer 3 IPMC cache limit in mixed mode also has the same value. | ExtremeSwitching X460-G2 | 26,000 |
| | ExtremeSwitching X450-G2 | 21,000 |
| | ExtremeSwitching X670-G2 | 77,500 |
| | ExtremeSwitching X620, X440-G2 | 1,500 |
| | ExtremeSwitching X870 | 52,000 |
| | ExtremeSwitching X690, X590, X465 | 93,000 |
| | ExtremeSwitching X695 | 104,000 |
| **Layer-3 IPv6 Multicast**—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled).<br><br>**Note:**<br>• Limit value is the same for MLD sender per switch, PIM IPv6 cache.<br>• The internal lookup table configuration used is "more l3-and-ipmc".<br>• Assumes source-group-vlan mode as lookup key. | ExtremeSwitching X670-G2 | 30,000 |
| | ExtremeSwitching X460-G2 | 14,000 |
| | ExtremeSwitching X450-G2 | 10,000 |
| | ExtremeSwitching X620, X440-G2 | 700 |
| | ExtremeSwitching X870 | 18,000 |
| | ExtremeSwitching X690, X590, X465 | 48,000 |
| | ExtremeSwitching X695 | 52,000 |

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

| Metric | Product | Limit |
|---|---|---|
| **Load sharing**—maximum number of load sharing groups.<br><br>**Note:** The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 128 |
| **Load sharing**—maximum number of ports per load-sharing group. | For standalone and stacked: ExtremeSwitching X620, X440-G2 | 8 |
| | For standalone: ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695 | 32 |
| | For stacked: ExtremeSwitching X670-G2, X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695 | 64 |
| **Logged messages**—maximum number of messages logged locally on the system. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 20,000 |
| **MAC-based security**—maximum number of MAC-based security policies. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 1,024 |
| **MAC Locking**—Maximum number of MAC locking stations that can be learned on a port. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 64 (static MAC locking stations) 600 (first arrival MAC locking stations) |
| **Meters**—maximum number of meters supported. | ExtremeSwitching X460-G2, X450-G2, X670-G2, X440-G2, X620, X870, X690, X590 , X465, X695 | 2,048 |

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

| Metric | Product | Limit |
|---|---|---|
| Maximum mirroring instances. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695<br><br>**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:<br><br>1. 4 ingress<br>2. 3 ingress + 1 egress<br>3. 2 ingress + 2 egress<br>4. 2 (ingress + egress)<br>5. 1 (ingress + egress) + 2 ingress<br>6. 1 (ingress + egress) + 1 egress + 1 ingress | 16 (including default mirroring instance) |
| | ExtremeSwitching X620, X440-G2<br><br>**Note:** For stacks containing X620 or X440-G2, maximum supported egress mirror instances is 1. | 1 (egress) |
| Mirroring (filters)—maximum number of mirroring filters.<br><br>**Note:** This is the number of filters across all the active mirroring instances. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 128 |
| Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters.<br><br>**Note:** This is the number of filters across all the active mirroring instances. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 128 |
| Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 16 |

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

| Metric | Product | Limit |
|---|---|---|
| **MLAG ports**—maximum number of MLAG ports allowed. | ExtremeSwitching X670-G2, X690, X695 | 71 |
| | ExtremeSwitching X440-G2, X450-G2 | 51 |
| | ExtremeSwitching X460-G2 | 53 |
| | ExtremeSwitching X620 | 15 |
| | ExtremeSwitching X870 | 127 |
| | ExtremeSwitching X590, | 35 |
| | ExtremeSwitching X465 | 55 |
| **MLAG peers**—maximum number of MLAG peers allowed. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 2 |
| **MPLS RSVP-TE interfaces**—maximum number of interfaces. | ExtremeSwitching X460-G2, X670-G2, X590, X465, X870 | 32 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| **MPLS RSVP-TE ingress LSPs**—maximum number of ingress LSPs. | ExtremeSwitching X460-G2, X670-G2, X870, X590,X690, X465 | 2,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 X590, X465 | N/A |
| **MPLS RSVP-TE egress LSPs**—maximum number of egress LSPs. | ExtremeSwitching X460-G2, X670-G2, X870, X690 X590, X465 | 2,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| **MPLS RSVP-TE transit LSPs**—maximum number of transit LSPs. | ExtremeSwitching X460-G2, X670-G2 | 2,000 |
| | ExtremeSwitching X870, X690, X590, X465 | 4,000 |
| | ExtremeSwitching X450-G2, and ExtremeSwitching X440-G2, X620 | N/A |
| **MPLS RSVP-TE paths**—maximum number of paths. | ExtremeSwitching X460-G2 | 1,000 |
| | ExtremeSwitching X670-G2, X870, X690, X590, X465 | 2,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| **MPLS RSVP-TE profiles**—maximum number of profiles. | ExtremeSwitching X460-G2 | 1,000 |
| | ExtremeSwitching X670-G2, X870, X690 X590, X465 | 2,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| **MPLS RSVP-TE EROs**—maximum number of EROs per path. | ExtremeSwitching X460-G2, X670-G2, X870, X690 X590, X465 | 64 |
| | ExtremeSwitching X450-G2, and ExtremeSwitching X440-G2, X620 | N/A |

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

| Metric | Product | Limit |
|---|---|---|
| MPLS LDP peers—maximum number of MPLS LDP peers per switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465 | 128 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch. | ExtremeSwitching X460-G2 | 50 |
| | ExtremeSwitching X670-G2, X870, X690 X590, X465 | 64 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465 | 2,048 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS LDP-enabled interfaces— maximum number of MPLS LDP configured interfaces per switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465 | 128 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465 | 4,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS LDP egress LSPs—maximum number of MPLS egress LSPs that can terminate on a switch. | ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465 | 4,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS static egress LSPs— maximum number of static egress LSPs. | ExtremeSwitching X460-G2 | 7,116 |
| | ExtremeSwitching X870, X690, X590, X465, X670-G2 | 8,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS static ingress LSPs— maximum number of static ingress LSPs. | ExtremeSwitching X460-G2, X870, X690 X590, X465 | 4,000 |
| | ExtremeSwitching X670-G2 | 2,048 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| MPLS static transit LSPs— maximum number of static transit LSPs | ExtremeSwitching X670-G2, X460-G2, X870, X690 X590, X465 | 4,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| Multicast listener discovery (MLD) snooping per-VLAN filters— maximum number of VLANs supported in per-VLAN MLD snooping mode. | ExtremeSwitching X460-G2, X670-G2, X870 | 768 |
| | ExtremeSwitching X450-G2 | 508 |
| | ExtremeSwitching X620, X440-G2 | 256 |
| | ExtremeSwitching X690, X590, X465, X695 | 1,500 |

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

| Metric | Product | Limit |
|---|---|---|
| Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per port.[n] | ExtremeSwitching X670-G2, X450-G2, X460-G2 | 4,000 |
| | ExtremeSwitching X620, X440-G2 | 3,500 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 4,000 |
| Multicast listener discovery (MLD)v1 subscribers—maximum number of MLDv1 subscribers per switch.[n] | ExtremeSwitching X460-G2, X450-G2, X620, X440-G2 | 10,000 |
| | ExtremeSwitching X670-G2 | 30,000 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 45,000 |
| Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per port.[n] | ExtremeSwitching X670-G2, X460-G2, X450-G2 | 4,000 |
| | ExtremeSwitching X620, X440-G2 | 3,500 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 4,000 |
| Multicast listener discovery (MLD)v2 subscribers—maximum number of MLDv2 subscribers per switch.[n] | ExtremeSwitching X670-G2 | 30,000 |
| | ExtremeSwitching X460-G2, X450-G2, X620, X440-G2 | 10,000 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 45,000 |
| Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465 , X695 | 200 |
| Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 500 |
| | ExtremeSwitching X440-G2, X620 | 50 |
| Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 50 |
| Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 1,024 |
| Network Login—maximum number of clients being authenticated with policy mode enabled with TCI overwrite enabled. | ExtremeSwitching X450-G2, X460-G2, X590, X465 | 1,024 |
| | ExtremeSwitching X670-G2, X870, X690, X695 | 512 |
| | ExtremeSwitching X620, X440-G2 | 256 |
| Network Login—maximum number of dynamic VLANs. | ExtremeSwitching X460-G2, X450-G2, X670-G2, X870, X690, X590, X465, X695 | 2,000 |
| | ExtremeSwitching X440-G2, X620 | 1,024 |

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

| Metric | Product | Limit |
|---|---|---|
| **Network Login VLAN VSAs**—maximum number of VLANs a client can be authenticated on at any given time. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 10 |
| **Network Service Identifiers (NSI)/ VLAN mappings**—maximum number of VLANs to NSI mappings. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 94 |
| **Node Alias**—maximum number of entries per slot. | ExtremeSwitching X450-G2, X460-G2, X670-G2 X620, X440-G2, X870, X690, X590, X465, X695 | 8,192 |
| **ONEPolicy Roles/Profiles**—maximum number of policy roles/ profiles. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 63 |
| **ONEPolicy Rules per Role/Profile**—maximum number of rules per role/policy. | ExtremeSwitching X450-G2, X460-G2 | IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256 |
| | ExtremeSwitching X670-G2, X870 | IPv6 Rules: 256 L2 Rules: 184 MAC Rules: 256 IPv4 Rules: 256 |
| | ExtremeSwitching X620, X440-G2 | IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch) |
| | ExtremeSwitching X465, X690, X590, X695 | IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440 |
| **ONEPolicy Authenticated Users per Switch**—maximum number of authenticated users per switch only with TCI-Overwrite enabled. | ExtremeSwitching X450-G2, X460-G2, X590, X465 | 1,024 |
| | ExtremeSwitching X670-G2, X690, X870, X695 | 512 |
| | ExtremeSwitching X620, X440-G2 | 256 |
| | Stacking | Depends on the stack nodes, but the maximum is 65,535. |

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

| Metric | Product | Limit |
|---|---|---|
| **ONEPolicy Authenticated Users per Switch**—maximum number of authenticated users per switch with TCI-Overwrite disabled.<br><br>**Note:** The maximum values assume 75% utilization of VLAN-XLATE hash table. | ExtremeSwitching X690, X590, X465 | 24,576 |
| | ExtremeSwitching X670-G2, X460-G2, X870, X695 | 12,288 |
| | ExtremeSwitching X450-G2 | 6,144 |
| | ExtremeSwitching X620, X440-G2 | 1,536 |
| | Stacking | 1,536–65,534 |
| **ONEPolicy Authenticated Users per Port per Switch**— maximum number of authenticated users per port per switch with TCI overwrite disabled.<br><br>**Note:** The maximum values assume 75% utilization of VLAN-XLATE hash table. | ExtremeSwitching X450-G2 | 6,144 |
| | ExtremeSwitching X460-G2, X670-G2, X870, X695 | 12,288 |
| | ExtremeSwitching X690, X590, X465 | 24,576 |
| | ExtremeSwitching X440-G2, X620 | 1,536 |
| **ONEPolicy Authenticated Users per Port per Switch**— maximum number of authenticated users per port with only with TCI-Overwrite enabled. | ExtremeSwitching X450-G2, X460-G2, X590, X465 | 1,024 |
| | ExtremeSwitching X670-G2, X870, X690, X695 | 512 |
| | ExtremeSwitching X620, X440-G2 | 256 |
| **ONEPolicy Permit/Deny Traffic Classification Rules Types**—total maximum number of unique permit/deny traffic classification rules types (system/stack). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870 | 952 |
| | ExtremeSwitching X620, X440-G2 | 440 |
| | ExtremeSwitching X690, X590, X465, X695 | 1,976 |
| **ONEPolicy Permit/Deny Traffic Classification Rules Types**— maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870 | 256 |
| | ExtremeSwitching X620, X440-G2 | N/A |
| | ExtremeSwitching X690, X590, X465, X695 | 512 |
| **ONEPolicy Permit/Deny Traffic Classification Rules Types**— maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870 | 256 |
| | ExtremeSwitching X620, X440-G2 | N/A |
| | ExtremeSwitching X690, X590, X465, X695 | 512 |
| **ONEPolicy Permit/Deny Traffic Classification Rules Types**— maximum number of unique IPv4 permit/deny traffic classification rules (typesipsource / ipdest / ipfrag / udpsourceportIP / udpdestportIP / tcpsourceportIP / tcpdestportIP / ipttl / iptos / iptype). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870 | 256 |
| | ExtremeSwitching X690, X590, X465, X695 | 512 |

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

| Metric | Product | Limit |
|---|---|---|
| ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique Layer 2 permit/deny traffic classification rules (ethertype/port). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870 | 184 |
| | ExtremeSwitching X620, X440-G2 | 184 |
| | ExtremeSwitching X690, X590, X465, X695 | 440 |
| Policy-based routing (PBR) redundancy—maximum number of flow-redirects. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465 , X695 | 256 [o] |
| Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695 | 32 [o] |
| Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN. | ExtremeSwitching X670-G2 | 63 |
| | ExtremeSwitching X460-G2 | 53 |
| | ExtremeSwitching X450-G2 | 51 |
| | ExtremeSwitching X440-G2 | 47 |
| | ExtremeSwitching X620 | 15 |
| | ExtremeSwitching X870 | 127 |
| | ExtremeSwitching X690, X695 | 71 |
| | ExtremeSwitching X590, X465 | 31 |
| Private VLANs—maximum number of private VLANs with an IP address on the network VLAN.<br><br>Note: This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 1,024 |
| | ExtremeSwitching X450-G2 | 510 |
| | ExtremeSwitching X440-G2 | 255 |
| | ExtremeSwitching X620 | 510 |
| Private VLANs—maximum number of private VLANs in an L2-only environment. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 1,280 |
| | ExtremeSwitching X450-G2 | 597 |
| | ExtremeSwitching X440-G2, X620 | 255 |
| PTP/1588v2 Clock Ports | ExtremeSwitching X460-G2, X670-G2 | 32 for boundary clock 1 for ordinary clock |
| | ExtremeSwitching X440-G2, X465, X620, X870, X690, X590, X695 | N/A |

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

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

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

| Metric | Product | Limit |
|---|---|---|
| **Spanning Tree PVST+**—maximum number of port mode PVST domains.<br><br>**Note:** For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, ExtremeSwitching X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256). | ExtremeSwitching X670-G2, X620 | 256 |
| | ExtremeSwitching X460-G2, X450-G2, X440-G2 | 128 |
| | ExtremeSwitching X870, X690, X590 , X465, X695 | 384 |
| **Spanning Tree**—maximum number of multiple spanning tree instances (MSTI) domains. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590 , X465, X695 | 64 |
| | ExtremeSwitching X440-G2 | 32 |
| **Spanning Tree**—maximum number of VLANs per MSTI.<br><br>**Note:** Maximum number of 10 active ports per VLAN when all 500 VLANs are in one MSTI. | ExtremeSwitching X670-G2 | 500 |
| | ExtremeSwitching X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695 | 600 |
| | ExtremeSwitching X440-G2 | 256 |
| **Spanning Tree**—maximum number of VLANs on all MSTP instances. | ExtremeSwitching X670-G2, X460-G2, X450-G2, X620, X870, X690, X590 , X465, X695 | 1,024 |
| | ExtremeSwitching X440-G2 | 512 |
| **Spanning Tree (802.1d domains)**—maximum number of 802.1d domains per port. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590 , X465, X695 | 1 |
| **Spanning Tree (number of ports)**—maximum number of ports including all Spanning Tree domains. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X870, X690, X590, X465, X695 | 4,096 |
| | ExtremeSwitching X440-G2 | 2,048 |
| **Spanning Tree (maximum VLANs)**—maximum number of STP-protected VLANs (dot1d and dot1w). | ExtremeSwitching X670-G2, X460-G2, X450-G2, X620, X870, X690, X590, X465, X695 | 1,024 |
| | ExtremeSwitching X440-G2 | 600 |
| **SSH (number of sessions)**—maximum number of simultaneous SSH sessions. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| **Static MAC multicast FDB entries**—maximum number of permanent multicast MAC entries configured into the FDB. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 1,024 |

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

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

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

| Metric | Product | Limit |
|---|---|---|
| VLAN Port Interfaces (VPIF)—maximum number of VLAN port interfaces. | ExtremeSwitching X440-G2, X450-G2, X460-G2, X465, , X590, X670-G2, X620, X690, X870, X695 | 131,585 |
| VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with the default license. | ExtremeSwitching X670-G2, X870, X690, X590 , X465, X695 | 32 |
| | ExtremeSwitching X440-G2 | 28 |
| | ExtremeSwitching X460-G2 | 26 |
| | ExtremeSwitching X620 | 16 |
| | ExtremeSwitching X450-G2 | 29 |
| | ExtremeSwitching X460-G2 | 24 |
| VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2. X870, X690, X590 , X465, X695 | 16 |
| VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN. | ExtremeSwitching X670-G2 | 63 |
| | ExtremeSwitching X460-G2 | 53 |
| | ExtremeSwitching X450-G2 | 51 |
| | ExtremeSwitching X620 | 15 |
| | ExtremeSwitching X440-G2 | 47 |
| | ExtremeSwitching X870 | 127 |
| | ExtremeSwitching X690, X695 | 71 |
| | ExtremeSwitching X590, X465 | 31 |
| VLAN translation—maximum number of translation VLAN pairs with an IP address on the translation VLAN.<br><br>Note: This limit is dependent on the maximum number of translation VLAN pairs in an L2-only environment if the configuration includes tagged and translated ports. | ExtremeSwitching X670-G2, X465, X870, X690, X590, X695 | 1,024 |
| | ExtremeSwitching X450-G2 | 512 |
| | ExtremeSwitching X620 | 510 |
| | ExtremeSwitching X440-G2 | 255 |
| VLAN translation—maximum number of translation VLAN pairs in an L2-only environment. | ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695 | 2,046 |
| | ExtremeSwitching X440-G2, X620 | 255 |

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

| Metric | Product | Limit |
|---|---|---|
| **XML requests**—maximum number of XML requests per second.<br><br>**Note:** Limits are dependent on load and type of XML request. These values are dynamic ACL data requests. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 10 with 100 DACLs |
| **XNV authentication**—maximum number of VMs that can be processed (combination of local and network VMs). | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 2,048 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | 1,024 |
| **XNV database entries**—maximum number of VM database entries (combination of local and network VMs). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 16,000 |
| **XNV database entries**—maximum number of VPP database entries (combination of local and network VPPs). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 2,048 |
| **XNV dynamic VLAN**—Maximum number of dynamic VLANs created (from VPPs /local VMs). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 2,048 |
| **XNV local VPPs**—maximum number of XNV local VPPs. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 2,048 ingress 512 egress |
| **XNV policies/dynamic ACLs**—maximum number of policies/dynamic ACLs that can be configured per VPP. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 ingress 4 egress |
| **XNV network VPPs**—maximum number of XNV network VPPs.[p] | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 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 9: Supported Limits for Advanced Edge License**

| Metric | Product | Limit |
|---|---|---|
| **BGP auto-peering**—maximum number of auto-peering nodes and VTEPs. | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 64 |
| **BGP auto-peering attached IPv4 hosts**— maximum number of attached IPv4 hosts. | ExtremeSwitching X670-G2 | 16,000 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 64,000 |

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

| Metric | Product | Limit |
|---|---|---|
| **BGP auto-peering attached IPv6 hosts**— maximum number of attached IPv6 hosts. | ExtremeSwitching X670-G2 | 254 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 8,000 |
| **BGP auto-peering ECMP**—maximum number of equal cost multipath for auto-peering.<br><br>**Note:** * Subject to the limitation imposed by the number of physical ports on a switch. | ExtremeSwitching X670-G2, ExtremeSwitching X690, X870, X590, X465, X695 | 16* |
| **BGP auto-peering maximum IPv4 prefixes with ECMP**—Maximum number of IPv4 Network prefixes with ECMP. | ExtremeSwitching X670-G2, ExtremeSwitching X690, X870, X590, X465, X695 | 64,000 |
| **BGP auto-peering maximum IPv6 prefixes with ECMP**—Maximum number of IPv6 Network prefixes with ECMP. | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 8,000 |
| **BGP auto-peering MLAG peers**— maximum MLAG peers per AutoBGP node. | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 1 |
| **BGP auto-peering VRFs**— maximum number of VRFs. | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 64 |
| **BGP auto-peering EVPN instances** —maximum EVPN instances. | ExtremeSwitching X670-G2, X690, X870, X590, X465, X695 | 1,024 |
| **EAPS domains**—maximum number of EAPS domains.<br><br>**Note:** An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains. | ExtremeSwitching X870, X690, X590, X465, X695 | 128 |
| | ExtremeSwitching X670-G2, X450-G2, X460-G2 | 64 |
| | ExtremeSwitching X440-G2, X620 | 32 |
| **EAPSv2 protected VLANs**— maximum number of protected VLANs. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X440-G2, X620 | 500 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 2,000 |
| **ERPS domains**—maximum number of ERPS domains without CFM configured. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 32 |
| **ERPS domains**—maximum number of ERPS domains with CFM configured. | ExtremeSwitching X450-G2, X670-G2, X620, X870, X690, X590, X465, X695 | 16 |
| | ExtremeSwitching X460-G2 | 32 |

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

| Metric | Product | Limit |
|---|---|---|
| ERPSv1 protected VLANs—maximum number of protected VLANs. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 2,000 |
| | ExtremeSwitching X620, X440-G2 | 1,000 |
| ERPSv2 protected VLANs—maximum number of protected VLANs. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 2,000 |
| | ExtremeSwitching X620, X440-G2 | 500 |
| ESRP groups—maximum number of ESRP groups | ExtremeSwitching X450-G2, X460-G2, X670-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 32 |
| ESRP domains—maximum number of ESRP domains. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 64 |
| ESRP L2 VLANs—maximum number of ESRP VLANs without an IP address configured. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 1,000 |
| ESRP L3 VLANs—maximum number of ESRP VLANs with an IP address configured. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 511 |
| ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| ESRP (IP route tracks)—maximum IP route tracks per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 1 |
| OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695 | 64 |
| | ExtremeSwitching X620 | 4 |
| | ExtremeSwitching X440-G2 | N/A |
| OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 8 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | 4 |
| OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB. | ExtremeSwitching X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X670-G2, X460-G2 | 5,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | 2,400 |
| OSPFv2 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain. | ExtremeSwitching X870, X690, X590, X465, X695 | 4,000 |
| | ExtremeSwitching X670-G2, X460-G2 | 2,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | 1,000 |

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

| Metric | Product | Limit |
|---|---|---|
| OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only). | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 4 |
| OSPFv2 links—maximum number of links in the router LSA. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 400 |
|  | ExtremeSwitching X450-G2, X620, X440-G2 | 4 |
| OSPFv2 neighbors—maximum number of supported OSPF adjacencies. | ExtremeSwitching X450-G2, X670-G2, X460-G2, X440-G2, X620, X870, X690, X590, X465, X695 | 4 |
| OSPFv2 routers in a single area— recommended maximum number of routers in a single OSPF area. | ExtremeSwitching X870, X690, X590, X465, X695 | 100 |
|  | ExtremeSwitching X670-G2, X460-G2 | 50 |
|  | ExtremeSwitching X450-G2, X440-G2, X620 | 4 |
| OSPFv2 virtual links—maximum number of supported OSPF virtual links. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 32 |
|  | ExtremeSwitching X450-G2, X440-G2, X620 | 4 |
| OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas. | ExtremeSwitching X870, X690, X590, X465, X695 | 100 |
|  | ExtremeSwitching X460-G2, X670-G2 | 16 |
|  | ExtremeSwitching X450-G2, X440-G2, X620 | 4 |
| OSPFv3 external routes— recommended maximum number of external routes. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 10,000 |
|  | ExtremeSwitching X450-G2, X440-G2, X620 | 1,200 |
| OSPFv3 inter- or intra-area routes —recommended maximum number of inter- or intra-area routes. | ExtremeSwitching X870, X690, X590, X465, X695 | 4.000 |
|  | ExtremeSwitching X670-G2, X460-G2 | 3,000 |
|  | ExtremeSwitching X450-G2, X440-G2, X620 | 500 |
| OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only). | ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X440-G2, X620, X590, X465, X695 | 4 |
| OSPFv3 neighbors—maximum number of OSPFv3 neighbors. | ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X440-G2, X620, X590, X465, X695 | 4 |
| OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 16 |
|  | ExtremeSwitching X450-G2, X440-G2, X620 | 4 |
| PIM IPv4 (maximum interfaces)— maximum number of PIM active interfaces. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X440-G2, X620, X690, X590, X465, X695 | 4 |

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

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

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

| Metric | Product | Limit |
|---|---|---|
| Port-specific VLAN tags—maximum number of port-specific VLAN tag ports. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 4,000 |
| | ExtremeSwitching X450-G2, X440-G2, X620 | N/A |
| VRRP (v2/v3-IPv4) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. <br><br> **Note:** These limits are applicable for Fabric Routing configuration also. <br><br> **Note:** Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type. | Normal Mode (as individual VRs): | |
| | ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695 | 511 |
| | ExtremeSwitching X440-G2, X620 | 128 |
| | Scaled Mode (with groups): | |
| | ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695 | 2,048 |
| | ExtremeSwitching X440-G2, X620 | 128 |
| VRRP (v3-IPv6) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. (VRRP-VRRPv3-IPv6) <br><br> **Note:** These limits are applicable for Fabric Routing configuration also. <br><br> **Note:** Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type. | Normal Mode (as individual VRs): | |
| | ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695 | 511 |
| | ExtremeSwitching X440-G2, X620 | 128 |
| | Scaled Mode (with groups): | |
| | ExtremeSwitching X670-G2, X460-G2, X450-G2, X870, X690, X590, X465, X695 | 2,048 |
| | ExtremeSwitching X440-G2, X620 | 128 |
| VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch. | ExtremeSwitching X670-G2, X460-G2, X450-G2 X440-G2, X620, X870, X690, X590, X465, X695 <br><br> **Note:** With Advanced Edge license or higher. | 255 |
| VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN. | ExtremeSwitching X670-G2, X460-G2, X450-G2 X440-G2, X620, X870, X690, X590, X465, X695 <br><br> **Note:** With Advanced Edge license or higher. | 255 |
| VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)—maximum number of ping tracks per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 <br><br> **Note:** With Advanced Edge license or higher. | 8 |

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

| Metric | Product | Limit |
|---|---|---|
| VRRP (maximum ping tracks)— maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 (20 centisecond or 1 second hello interval) |
| VRRP (v3-IPv6) (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 (20 centisecond or 1 second hello interval) |
| VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)— maximum number of IP route tracks per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| VRRP (v2/v3-IPv4/IPv6)— maximum number of VLAN tracks per VLAN. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X620, X440-G2, X870, X690, X590, X465, X695 | 8 |
| VXLAN—maximum virtual networks.<br><br>**Note:** Every VPLS instance/PSTag VLAN reduces this limit by 1.<br><br>**Note:** Assumption is all BUM (broadcast/unknown-unicast/ multicast) FDB entries are pointing to the same set of RTEPs when all VNETs use explicit flooding. Depends on whether all VNETs use standard or explicit and the number of tenant VLAN ports. | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 2,048–4,000 |
| | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | N/A |
| VXLAN—maximum tenant VLANs plus port combinations<br><br>**Note:** Every (VPLS/PSTag VLAN) + port reduces the limit by 1. | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 4,096 |
| | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | N/A |
| VXLAN—maximum static MAC to IP bindings.<br><br>**Note:** Every FDB entry configured reduces this limit by 1. | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 64,000 |
| | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | N/A |
| VXLAN—maximum RTEP IP addresses | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 512 |
| | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | N/A |

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

| Metric | Product | Limit |
|---|---|---|
| VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 4,000 |
| | ExtremeSwitching X460-G2, X450-G2, X440-G2, X620 | N/A |

# Supported Limits for Core License

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

**Table 10: Supported Limits for Core License**

| Metric | Product | Limit |
|---|---|---|
| BGP (aggregates)—maximum number of BGP aggregates. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 256 |
| | ExtremeSwitching X450-G2 | 204 |
| BGP (networks)—maximum number of BGP networks. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 1,024 |
| | ExtremeSwitching X450-G2 | 820 |
| BGP (peers)—maximum number of BGP peers. <br><br>Note: With default keepalive and hold timers. <br><br>Note: Each BGPv4/BGPv6 peer handles a maximum of 50 routes. <br><br>Note: ECMP should not be enabled for BGP. | ExtremeSwitching X460-G2, X670-G2, X870 | 128 |
| | ExtremeSwitching , X590, X465, X695 | 300 |
| | ExtremeSwitching X450-G2 | 100 |
| | ExtremeSwitching X690 | 500 |
| BGP (peer groups)—maximum number of BGP peer groups. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 64 |
| | ExtremeSwitching X450-G2 | 50 |
| BGP (policy entries)—maximum number of BGP policy entries per route policy. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 256 |
| | ExtremeSwitching X450-G2 | 204 |
| BGP (policy statements)—maximum number of BGP policy statements per route policy. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 1,024 |
| | ExtremeSwitching X450-G2 | 820 |
| BGP multicast address-family routes—maximum number of multicast address-family routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 25,000 |
| | ExtremeSwitching X450-G2 | 20,000 |

**Table 10: Supported Limits for Core License (continued)**

| Metric | Product | Limit |
|---|---|---|
| **BGP (unicast address-family routes)**—maximum number of unicast address-family routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590 , X465 , X695 (at default) | 25,000 |
| | ExtremeSwitching X870, X690, X590 , X465 (with ALPM enabled) | 100,000 |
| | ExtremeSwitching X450-G2 | 20,000 |
| **BGP (non-unique routes)**—maximum number of non-unique BGP routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 25,000 |
| | ExtremeSwitching X450-G2 | 20,000 |
| **BGP ECMP**—maximum number of equal cost paths per multipath for BGP and BGPv6. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 2, 4, 8, 16, 32, or 64 |
| | ExtremeSwitching X450-G2 | 64 |
| **BGPv6 (unicast address-family routes)**—maximum number of unicast address family routes. | ExtremeSwitching X460-G2 | 6,000 |
| | ExtremeSwitching X670-G2 | 8,000 |
| | ExtremeSwitching X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X870, X690 (with ALPM enabled) | 100,000 |
| | ExtremeSwitching X450-G2 | 4,800 |
| **BGPv6 (non-unique routes)**—maximum number of non-unique BGP routes. | ExtremeSwitching X460-G2 | 18,000 |
| | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 24,000 |
| | ExtremeSwitching X450-G2 | 14,000 |
| **EVPN EVI instances**—maximum number of EVI instances. | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 1,024 |
| **EVPN LAGs**—maximum number of LAGs. | ExtremeSwitching X670-G2, X870, X690, X590, X465, X695 | 128 |
| **GRE Tunnels**—maximum number of GRE tunnels. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465 , X695 | 255 |
| | ExtremeSwitching X620, X440G2 | N/A |
| **IS-IS adjacencies**—maximum number of supported IS-IS adjacencies. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 128 |
| | ExtremeSwitching X450-G2 | N/A |
| **IS-IS ECMP**—maximum number of equal cost paths per multipath for IS-IS. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 2, 4, or 8 |
| | ExtremeSwitching X450-G2 | N/A |
| **IS-IS interfaces**—maximum number of interfaces that can support IS-IS. | ExtremeSwitching X460-G2, X670-G2, X770, X870, X690, X590, X465, X695 | 255 |
| | ExtremeSwitching X450-G2 | N/A |

**Table 10: Supported Limits for Core License (continued)**

| Metric | Product | Limit |
|---|---|---|
| IS-IS routers in an area—recommended maximum number of IS-IS routers in an area. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 256 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 20,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv4 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 25,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 25,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv4 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 20,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a L1/I2 router. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv4/IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 20,000 |
| | ExtremeSwitching X450-G2 | N/A |
| IS-IS IPv4/IPv6 L2 routes in an L2 router—recommended maximum number of IS-IS Level 2 routes in a Level 2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 20,000 |
| | ExtremeSwitching X450-G2 | N/A |

**Table 10: Supported Limits for Core License (continued)**

| Metric | Product | Limit |
|---|---|---|
| **IS-IS IPv4/IPv6 L1 routes in an L1/L2 router**—recommended maximum number of IS-IS Level 1 routes in a Level 1/Level2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 20,000 |
| | ExtremeSwitching X450-G2 | N/A |
| **MSDP active peers**—maximum number of active MSDP peers. | ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695 | 64 |
| **MSDP SA cache entries**—maximum number of entries in SA cache. | ExtremeSwitching X670-G2, X690, X590, X465, X695 | 14,000 |
| | ExtremeSwitching X460-G2 | 10,000 |
| | ExtremeSwitching X870 | 11,000 |
| | ExtremeSwitching X450-G2 | 8,000 |
| **MSDP maximum mesh groups**—maximum number of MSDP mesh groups. | ExtremeSwitching X450-G2, X670-G2, X460-G2, X870, X690, X590, X465, X695 | 16 |
| **OSPFv2/v3 ECMP**—maximum number of equal cost multipath OSPFv2 and OSPFv3. | ExtremeSwitching X460-G2, X670-G2, X450-G2, X870, X690, X590, X465, X695 | 64 |
| **OSPFv2 areas**—as an ABR, how many OSPF areas are supported within the same switch. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 8 |
| **OSPFv2 external routes**—recommended maximum number of external routes contained in an OSPF LSDB. | ExtremeSwitching X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X670-G2, X460-G2 | 5,000 |
| | ExtremeSwitching X450-G2 | 4,000 |
| **OSPFv2 inter- or intra-area routes**—recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain. | ExtremeSwitching X870, X690, X590, X465, X695 | 4,000 |
| | ExtremeSwitching X670-G2, X460-G2 | 2,000 |
| | ExtremeSwitching X450-G2 | 1,600 |
| **OSPFv2 interfaces**—recommended maximum number of OSPF interfaces on a switch (active interfaces only). | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 400 |
| | ExtremeSwitching X450-G2 | 320 |
| **OSPFv2 links**—maximum number of links in the router LSA. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 400 |
| | ExtremeSwitching X450-G2 | 320 |
| **OSPFv2 neighbors**—maximum number of supported OSPF adjacencies. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 128 |
| | ExtremeSwitching X450-G2 | 96 |

**Table 10: Supported Limits for Core License (continued)**

| Metric | Product | Limit |
|---|---|---|
| OSPFv2 routers in a single area— recommended maximum number of routers in a single OSPF area. | ExtremeSwitching X870, X690, X590, X465, X695 | 100 |
| | ExtremeSwitching X670-G2, X460-G2 | 50 |
| | ExtremeSwitching X450-G2 | 40 |
| OSPFv2 virtual links—maximum number of supported OSPF virtual links. | ExtremeSwitching X460-G2, X670-G2, X870, X690, X590, X465, X695 | 32 |
| | ExtremeSwitching X450-G2 | 25 |
| OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas. | ExtremeSwitching X870, X690, X590, X465, X695 | 100 |
| | ExtremeSwitching X460-G2, X670-G2 | 16 |
| | ExtremeSwitching X450-G2 | 12 |
| OSPFv3 external routes— recommended maximum number of external routes. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 10,000 |
| | ExtremeSwitching X450-G2 | 7,500 |
| OSPFv3 inter- or intra-area routes —recommended maximum number of inter- or intra-area routes. | ExtremeSwitching X870, X690, X590, X465, X695 | 4.000 |
| | ExtremeSwitching X670-G2, X460-G2 | 3,000 |
| | ExtremeSwitching X450-G2 | 500 |
| OSPFv3 interfaces—maximum number of OSPFv3 interfaces (active interfaces only). | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 256 |
| | ExtremeSwitching X450-G2 | 192 |
| OSPFv3 neighbors—maximum number of OSPFv3 neighbors. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 64 |
| | ExtremeSwitching X450-G2 | 48 |
| OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported. | ExtremeSwitching X670-G2, X460-G2, X870, X690, X590, X465, X695 | 16 |
| | ExtremeSwitching X450-G2 | 12 |
| PIM IPv4 (maximum interfaces)— maximum number of PIM active interfaces. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 255 |
| PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695 | 180 |
| PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590, X465, X695 | 3,000 (depends on policy file limits) |
| PIM IPv4 Limits—maximum number of multicast sources per group. | ExtremeSwitching X450-G2, X460-G2, X670-G2, X870, X690, X590 , X465, X695 | 5,000 |

**Table 10: Supported Limits for Core License (continued)**

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

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[a] The table shows the total available. When installing ACL rules bound to a set of ports, rules are replicated for each port if there are ACL counters and counter compression is not enabled, or if the ports are Extended Edge Switching extended ports.
[c] When there are BFD sessions with minimal timer, sessions with default timer should not be used.
[f] Effective capacity varies based on actual MAC addresses and VLAN IDs used and hash algorithm selected.
[g] Based on "configure forwarding internal-tables more l2".
[h] Based on "configure forwarding internal-tables more l3-and-ipmc".
[j] The limit depends on setting configured with configure iproute reserved-entries.
[m] The IPv4 and IPv6 multicast entries share the same hardware tables, so the effective number of IPv6 multicast entries depends on the number of IPv4 multicast entries present and vice versa.
[n] If IGMP and MLD are simultaneously configured on the switch, the number of effective subscribers supported are lessened accordingly.
[o] The total of all PBR next hops on all flow redirects should not exceed 4,096.
[p] The number of XNV authentications supported based on system ACL limitations.
[q] Based on "configure forwarding internal-tables more routes".
[r] Based on `configure forwarding internal-tables more routes ipv6-mask-length 128.`

# Open Issues, Known Behaviors, and Resolved Issues

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

## Open Issues

The following are new open issues for supported features found in ExtremeXOS 30.6.

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

| CR Number | Description |
|---|---|
| General | |
| xos0078188 | Image installation takes a little longer for ExtremeXOS 30.6, and the following log message might appear due to this:<br><br>`<Warn:EPM.Upgrade.State> Upgrade status Installation time may be greater than expected due to a lack of memory resources` |
| Extended Edge Switching | |
| xos0077857 | With a one-armed and cross-connect MLAGs in a ring topology, link flap of 1 to 2 minutes on the ISC ports causes the ring to remain in the severed state. |
| xos0078375 | With a large amount of multicast traffic on an Extended Edge Switching ring with controlling bridge (CB) MLAG setup, traffic loss and duplicates occur after rebooting a CB.<br>**Workaround**: Change the IPMC replication mode to the CB using the following command: `configure` **`forwarding vpex ipmc replication controlling-bridge`**. |
| ExtremeSwitching X695 Series Switches | |
| xos0077787 | On ExtremeSwitching X695 series switches, clearing the port counters when running the `show port statistics` command causes the console to stop responding for a few seconds. |
| xos0077548 | On ExtremeSwitching X695 series switches, "Other" group CPU utilization does not appear accurately in the `show process group` command. |

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

| CR Number | Description |
|---|---|
| xos0077557 | On ExtremeSwitching X695 series switches, the command `show process group` displays CPU utilization of the "Other" group tasks also under the "EXOS" group. |
| xos0077760 | On ExtremeSwitching X695 series switches, IPv6 tunnel traffic might be dropped at the tunnel end point when multiple IPv6-to-IPv4 and IPv6-in-IPv4 tunnels are configured. |
| xos0078223 | On ExtremeSwitching X695 series switches, IP/TCP fragment anomaly protection counters do not increment appropriately. |
| xos0077836 | On ExtremeSwitching X695 series switches, with ECMP enabled for the VXLAN overlay network, deleting static overlay routes produces a shadow problem error and traffic is stopped. |
| xos0077730 | On ExtremeSwitching X695 series switches, VMAN over VXLAN is not supported. |

# Known Behaviors

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

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

| CR Number | Description |
|---|---|
| ExtremeSwitching X695 Series Switches | |
| xos0077221 | On ExtremeSwitching X695 series switches, when the management port link is actually down, the command `show management` on the switch shows the link as active. |
| Policy | |
| xos0078266 | Downgrading from ExtremeXOS 30.5, or later, to 30.4, or earlier, causes loss of policy profile configurations. **Workaround**: Before upgrading to 30.5, or later, save your 30.4, or earlier, policy configuration to ensure that you can downgrade back to 30.4, or earlier, if needed. |

# Resolved Issues in ExtremeXOS 30.6

The following issues were resolved in ExtremeXOS 30.6. ExtremeXOS 30.6 includes all fixes up to and including ExtremeXOS 11.6.5.3, and earlier, ExtremeXOS 12.0.5, ExtremeXOS 12.1.7, ExtremeXOS 12.2.2-patch1-12, ExtremeXOS 12.3.6, ExtremeXOS 12.4.5, ExtremeXOS 12.5.5, ExtremeXOS 12.6.3, ExtremeXOS 12.6.5, ExtremeXOS 12.7.1, ExtremeXOS 15.1.5, ExtremeXOS 15.2.4, ExtremeXOS 15.3.3, ExtremeXOS 15.4.1, ExtremeXOS 15.5.1, ExtremeXOS 15.5.2, ExtremeXOS 15.6.1, ExtremeXOS 15.6.2, ExtremeXOS 15.7.1, ExtremeXOS 16.1, ExtremeXOS 16.1.2, ExtremeXOS 16.1.3, ExtremeXOS 21.1, ExtremeXOS 22.1, ExtremeXOS 22.2, ExtremeXOS 22.3, ExtremeXOS 22.4, ExtremeXOS 22.5, ExtremeXOS 22.6,

ExtremeXOS 30.1, ExtremeXOS 30.2, ExtremeXOS 30.3, ExtremeXOS 30.4, and ExtremeXOS 30.5. For information about those fixes, see the release notes for the specific release.

**Table 13: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 30.6**

| CR Number | Description |
|---|---|
| General | |
| xos0076267 | Running the command `run script clone.py slot all` fails when the inactive partition has an ExtremeXOS 30.3 image on the master slot, and all other standby/backup slots have ExtremeXOS 30.4 on both partitions. |
| xos0077550 | If default route is present, slow-path forwarding of multicast traffic does not occur correctly. |
| xos0077732 | After a reboot simultaneous running of the `show system` command on 8 Telnet/SSH sessions results in cli master crash. |
| xos0077793 | PIM routers should accept include-mode registers as per RFC compliance. |
| xos0077898 | Software upgrade from ExtremeXOS 16.2 to 30.3, or later, fails during installation. |
| xos0078029 | ExtremeXOS supports timezone GMT offset configuration from -720 to +720 minutes. This range needs to be extended to +840 minutes to support the time zone configuration of certain islands, such as Chatham (New Zealand), Kiribati island, etc. |
| xos0077893 | After an IGMP receiver flaps twice, multicast streams are not forwarded to receivers by PIM-SSM. |
| ExtremeSwitching X435 Series Switches | |
| xos0076886 | On ExtremeSwitching X435, egress ACLs are not supported. |
| ExtremeSwitching X440-G2 Series Switches | |
| xos0077537 | On ExtremeSwitching X440G2-12p switches, 10G ports do not come up after a reboot. |
| 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. |
| xos0077772 | On ExtremeSwitching X440-G2 series switches using 1G optics on 10G ports, ports do not come up after rebooting. |
| ExtremeSwitching X465 Series Switches | |
| xos0077616 | When connecting a new node to a stack using automatic stacking, FPGA and CPLD is not updated on the new node. |
| xos0077617 | When adding or replacing a node running the in a stack using automatic stacking, and the new node has the same software version as the master, but on the opposite partition, subsequent image downloads fail. |
| ExtremeSwitching X870 Series Switches | |
| xos0077775 | On ExtremeSwitching X870 series switches, Extreme-certified optics are detected as "unknown". |
| ExtremeSwitching X460-G2 Series Switches | |

**Table 13: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 30.6 (continued)**

| CR Number | Description |
|---|---|
| xos0078058 | On ExtremeSwitching X460-G2 VIM-2Q 40G ports, during power-up, or when inserting or removing transceivers, if stacking auto-discovery is enabled, multiple link flaps might occur. |
| OSPFv3 | |
| xos0077574 | OSPFv3 routes hold for spf-hold-time even when interface is taken down. |
| Security | |
| xos0075337 | With ONEPolicy and multiple authentication (MAC and Dot1x), session timeout and idle timeout are not applied to the Dot1x user when authenticated for the first time. |
| xos0076261 | With NetLogin authentication mode optional configured, the first packet used for for authentication is not forwarded/flooded to other ports in the VLAN. |
| xos0076294 | Memory leak occurs in thttpd process while accessing network web login page, causing a switch reboot. |
| SNMP | |
| xos0077494 | SNMP process ends unexpectedly with signal 6 after running the switch for 497 days. |
| xos0078024 | On ExtremeSwitching X465, X690, X695, X590, and X870 series switches, Node Alias does not update the TLL of an existing MAC-IP entry with new DHCP. |
| STP | |
| xos0077434 | STP module default configuration does not appear in the output of the command `show configuration stp detail`. |
| SummitStack | |
| xos0075986 | Kernel error occurs when deleting a port from VRRP VLANs. |
| VLANs | |
| xos0076140 | IPv6 ping fails over PSTag. |