ExtremeXOS Release Notes

Software Version ExtremeXOS 22.3

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Preface

Conventions

This section discusses the conventions used in this guide.

Text Conventions

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

Table 1: Notice Icons

Icon	Notice Type	Alerts you to...
	General Notice	Helpful tips and notices for using the product.
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.
	New	This command or section is new for this release.

Table 2: Text Conventions

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 with brackets, such as **[Return]** or **[Esc]**. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press **[Ctrl]**+**[Alt]**+**[Del]**
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.

Platform-Dependent Conventions

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

- ExtremeSwitching® switches
- Summit® switches
- SummitStack™

When a feature or feature implementation applies to specific platforms, the specific platform is noted in the heading for the section describing that implementation in the ExtremeXOS command documentation (see the Extreme Documentation page at http://documentation.extremenetworks.com). 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™ or Summit®, the family name is used. Explanations about features and operations that are the same across all product families simply refer to the product as the switch.

Providing Feedback to Us

We are always striving to improve our documentation and help you work better, so we want to hear from you! We welcome all feedback but especially want to know about:

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

If you would like to provide feedback to the Extreme Networks Information Development team about this document, please contact us using our short online feedback form. You can also email us directly at internalinfodev@extremenetworks.com.

Getting Help

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

- **GTAC (Global Technical Assistance Center) for Immediate Support**
  - **Phone:** 1-800-998-2408 (toll-free in U.S. and Canada) or +1 408-579-2826. For the support phone number in your country, visit: www.extremenetworks.com/support/contact
  - **Email:** support@extremenetworks.com. To expedite your message, enter the product name or model number in the subject line.
- **GTAC Knowledge** — Get on-demand and tested resolutions from the GTAC Knowledgebase, or create a help case if you need more guidance.
- **The Hub** — A forum for Extreme customers to connect with one another, get questions answered, share ideas and feedback, and get problems solved. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.
- **Support Portal** — Manage cases, downloads, service contracts, product licensing, and training and certifications.

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

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

Related Publications

ExtremeXOS Publications

- *ACL Solutions Guide*
- *ExtremeXOS 22.3 Command Reference Guide*
- *ExtremeXOS 22.3 EMS Messages Catalog*
- *ExtremeXOS 22.3 Feature License Requirements*
- *ExtremeXOS 22.3 User Guide*
- *ExtremeXOS OpenFlow 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*

Open Source Declarations

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

1 Overview

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These release notes document ExtremeXOS 22.3, which adds features and resolves software deficiencies.

Upgrading ExtremeXOS

While ExtremeXOS 22.3 supports all features on all applicable platforms as indicated in these release notes, upgrading to ExtremeXOS 22.3 from releases earlier than 22.2 may involve performance trade-offs of some feature on certain platforms. For information about feature- and platform-specific issues, see Open Issues on page 62 and Known Behaviors on page 67. For information about recommended releases for specific platforms, see http://www.extremenetworks.com/extreme-hardwaresoftware-compatibility-recommendation-matrices/software-release-recommendations/.

Specifically, for ExtremeXOS 22.3, the Summit X770 series switches are experiencing an ARP learning rate issue (xos0068553). For optimal performance of Summit X770 series switches, we recommend that you consider the new features/enhancements in ExtremeXOS 22.3 and determine if these features/enhancements outweigh this performance issue for your networking environment before upgrading.

For instructions about upgrading ExtremeXOS software, see "Software Upgrade and Boot Options" in the *ExtremeXOS 22.3 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.

New and Corrected Features in ExtremeXOS 22.3

This section lists the new and corrected features supported in the 22.3 software:

Multiprotocol Border Gateway Protocol (MBGP) Support for Virtual Extensible LAN (VXLAN)

The Border Gateway Protocol (BGP) is a general purpose routing protocol that runs over TCP. routes can be carried on different address family (afi) and sub-address family (safi) combinations as specified in the Multiprotocol BGP (MBGP) extensions.

The BGP implementation for ExtremeXOS supports carrying Virtual Extensible LAN (VXLAN) Network Identifier (VNI) and Local VXLAN Tunnel Endpoint (LTEP) combinations as MBGP routes using a proprietary afi/safi combination. Even though supported LTEPs are IPv4, the VXLAN routes can be carried over IPv6 peering sessions.

Supported Platforms

Summit X770, X670-G2, and ExtremeSwitching X870, X690 series switches.

Limitations

The ability to carry VXLAN routes cannot be enabled on a per peer group basis.

Changed CLI Commands

Changes are underlined.

```
enable bgp neighbor [all | remoteaddr] capability [ipv4-unicast | ipv4-
multicast |ipv6-unicast | ipv6-multicast |vpnv4 |route-refresh | ipv4-vxlan]

disable bgp neighbor [all | remoteaddr] capability [ipv4-unicast | ipv4-
multicast |ipv6-unicast | ipv6-multicast |vpnv4 |route-refresh | ipv4-vxlan]

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

show bgp routes {address-family [ipv4-unicast | ipv4-multicast |ipv6-
unicast | ipv6-multicast | ipv4-vxlan]} {detail} [ipv4-vxlan |all | as-path
```

```
path-expression | community [no-advertise | no-export | no-export-subconfed
| number community_number | autonomous-system-id : bgp-community] |
network [any / netMaskLen | networkPrefixFilter] {exact}]
```

```
show bgp routes {address-family [ipv4-unicast | ipv4-multicast |ipv6-
unicast | ipv6-multicast | vpnv4 | ipv4-vxlan]} summary
```

The output of the following command is changed to show IPv4 VXLAN information:

```
show bgp
```

Explicit Congestion Notification (ECN)

Weighted Random Early Detection (WRED) drops packets based on the average length exceeding a specific threshold value to indicate congestion. Explicit Congestion Notification (ECN) is an extension to WRED that marks the drop-eligible packets, instead of dropping, using the same criteria of minimum threshold, maximum threshold, and drop probability.

The current WRED implementation prevents tail dropping of packets that are queued in the output queue by selectively dropping packets early. This avoids dropping of all packets at once when congestion occurs. With ECN functionality, routers are no longer limited to packet drops to indicate congestion. Routers can instead set the CE (Congestion Experienced) codepoint in the IP header of packets from ECN-capable transport entities. The transport endpoints use the ECE and CWR bits of the TCP header to mitigate congestion.

Supported Platforms

Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 series switches.

Limitations

- TCP yellow traffic color is not supported.
- ECN over VXLAN is not supported. Any tunneling protocol implemented with double headers is not supported.
- Except for on the ExtremeSwitching X870 series switches, the ECN counters showing the number of marked packets is not available yet, so those appear as 0.
- This implementation is limited to ECN pass-through. End points having TCP/DCTCP/RoCEv2 capabilities can use the ECN services.

New CLI Commands

```
configure qosprofile egress qp_num wred ecn [on | off] ports [port_list |
all ]
```

```
clear counters wred ecn
```

Changed CLI Commands

Changes are underlined.

```
show ports port_list wred ecn {no-refresh | refresh}
```

The following show command is revised to display ECN information:

```
show wredprofile {ports [port_list | all]}
```

Address Resolution Protocol (ARP) Suppression

Address Resolution Protocol (ARP) traffic makes up a large percentage of broadcast traffic within data centers. This traffic is even more taxing when multiple overlay networks share a common underlay network—as is the case with tunneling technologies like VXLAN. Therefore it is desirable to reduce ARP traffic.

This can be done by allowing Virtual Tunnel End Points (VTEPs) to proxy ARP requests and reply on behalf of the remote endpoint. VTEPs snoop ARP replies, exiting the virtual network tunnel to learn the remote endpoint's IP to MAC mapping. The VTEP stores this in its ARP cache for the tenant VLAN.

This feature may be used even if the tenant VLAN does not have an IP interface. In that case, ARP cache entries are still learned. If an entry needs to be refreshed, the ARP request is sent with a source protocol address of all zeros. This is functionally equivalent to an ARP probe. This feature is disabled by default for configured virtual networks.

Supported Platforms

Summit X770, X670-G2, and ExtremeSwiching X870, X690 series switches.

New CLI Commands

```
configure vlan vlan_name suppress [arp-only |none]

configure forwarding iparpsuppression filters [per-port |per-vlan]
```

Changed CLI Commands

The following command's output is changed to show virtual network remote endpoints:

```
show iparp {ip_addr |mac | [ {vlan}vlan_name |vlan vlan_list] |permanent}
{port port {vr vr_name}
```

BGP Multipath-Relax Feature

This feature overrides the default protocol behavior specified in *RFC-4271* related to route selection tie breakers and the definition of equal cost. In particular, routes with the same AS-path length, but differing AS numbers in the path are not considered equal cost by default. However, with multipath-relax enabled, routes with the same AS-path length can have differing AS number values in the AS-path and still be considered equal cost.

Supported Platforms

Summit X770, X670-G2, and ExtremeSwitching X870, X690 series switches.

New CLI Commands

```
enable bgp multipath-relax

disable bgp multipath-relax
```

Changed CLI Commands

The following command now shows the status of the BGP multipath-relax feature:

```
bgp show
```

Locally Administered MAC Addresses

ExtremeXOS switches do not use a unique per-port MAC address when transmitting bridge protocol data units (BPDUs). As a result, switch management can become inaccessible when switch MAC addresses are learned on the wrong L2 path (corresponding to a blocking port). You can now direct the switch to generate locally administered addresses (LAA). When this feature is enabled, for Spanning Tree Protocol (STP), the source MAC address is changed to LAA MAC while transmitting the STP/RSTP/MSTP BPDUs. When LAA is enabled, the source MAC address is assigned as 06xx:xx:xx:xx;xx. The "06" replaces the first byte of the system MAC address.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Limitations

Only STP uses LAA MAC.

New CLI Commands

```
enable switch locally-administered-address
```

```
disable switch locally-administered-address
```

Changed CLI Commands

The following show command is changed to display the status of this feature:

```
show switch
```

Captive Portal Redirection

Captive Portal Redirection uses HTTP redirection to force a client's web browser to be redirected to a particular administrative web page. You can use this feature for such web-based purposes as:

• Authentication—request a user login and password
• Payment—for example, at an airport hotspot
• Use-policy enforcement—require installing necessary software, agreeing to terms of service (TOS), etc.

Captive Portal Redirection is an extension of the ONEPolicy feature. You can configure policy roles to force redirection of HTTP traffic by specifying a web redirection class index that corresponds to a list of potential redirection servers (captive portal server IP and TCP port numbers identifying HTTP traffic). For traffic that is placed into one of these policy roles (through authentication or policy admin-profile rules) certain actions are taken.

If the incoming traffic is on the configured L4 port and is not destined for the configured captive portal server IP, the switch causes an HTTP redirect message (code 307) to be sent back to the client. If the incoming traffic is destined for the configured captive portal server IP, or it is not on one of the configured listening L4 ports, the traffic is handled according to the rest of the policy role configuration.

You can configure up to three ports on which ONEPolicy listens for client traffic that is (potentially) subject to HTTP redirection. You can configure ten groups of two captive portal servers that can be used to redirect traffic in different roles to different servers.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

New CLI Commands

```
configure policy captive-portal web-redirect redirect_index server
server_id {url redirect_url} {status}
```

```
unconfigure policy captive-portal web-redirect redirect_index server
server_id
```

```
configure policy captive-portal listening socket_list
```

```
unconfigure policy captive-portal listening [ socket_list | all ]
```

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

Changed CLI Commands

Changes are underlined.

```
configure policy profile profile_index {name name} {pvid pvid} {pvid-
status pvid_status} {cos cos} {cos-status cos_status} {egress-vlans
egress_vlan_list}{forbidden-vlans forbidden_vlans} {untagged-vlans
untagged_vlans} {append | clear} {tci-overwrite tci_overwrite} {auth-
override auth_override} {web-redirect web_redir_index}
```

CLI File Name Completion

When entering a command, at the point where a file name could be entered, press **[Tab]** or **?** to display an alphabetically sorted list of possible file names. You can also type part of the file name to display a filtered list of file names matching what you have typed so far.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Command Aliases

You can create aliases to execute any ExtremeXOS command, including any options, arguments, and redirection.

For example, you can create an alias called "download" to substitute for "`download image 102.3.10.5`". Now you can now simply type "download" and then the image file name to download your ExtremeXOS image from the 102.3.10.5 location, instead of typing `download image 102.3.10.5` **`image_name`**

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Limitations

- Arguments cannot occur in the middle of alias commands. For example, you cannot create an alias "set_vlan_ip" for the command `configure` **`vlan`** *`vlan_name`* **`ipaddress`** *`ip_address`* where you specify the VLAN name as an argument. This is because aliases work through direct textual substitution.
- Aliases cannot be chained together. For example, if you create an alias "sh" for `show version` and another alias "ps" for `process`, then entering `sh ps` at the prompt is not equivalent to entering "`show version process`".
- You cannot tab-complete commands when creating an alias by using the `alias` command.
- Aliases cannot be created for the current shell session using UPM scripts or Python scripts.
- Tab completion does not work for commands given inside the aliases.

New CLI Commands

`alias` *`alias_name command`*

`unalias` *`alias_name`* **`-a`**

USB Zero Touch Provisioning for Transferring Switch Configuration

You can copy one switch's configuration (ExtremeXOS image, configuration files, scripts) to another switch using USB Zero Touch Provisioning (ZTP).

Insert a USB drive with the desired configuration files on it into an unconfigured switch (does not need to be connected to the network), and the unconfigured switch automatically searches for the files and deploys them. The switch auto detects the USB drive at bootup or while ExtremeXOS is running.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Limitations

- The USB drive must be formatted with FAT32.
- The receiving switch must be unconfigured.

- Stacking cannot be enabled.

New Stacking Port Statistics Commands

ExtremeXOS 22.3 introduces new stacking port statistics commands to view stacking port congestion, QoS queue statistics, and QoS queue congestion. These commands work similarly to their non-stacking port equivalents.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

New CLI Commands

show ports **stack-ports** *stack_port_list* **congestion** {**no-refresh** | **refresh**} **port-number**

show ports **stack-ports** *stack_port_list* **qosmonitor** {**no-refresh** | **refresh**} **port-number**

show ports **stack-ports** *stack_port_list* **qosmonitor congestion** {**no-refresh** | **refresh**} **port-number**

Automatic Authentication When Using Telnet Between Stack Nodes

You can now Telnet from any node in a stack to another node without having to re-enter your user credentials. When the target node accepts the related TCP connection, you are logged in to the same account (with corresponding rights) with which you accessed the originating slot.

Additionally, when Telneting to a switch from an external device, you can use the option –l *username* to provide your user name, rather than waiting to be prompted at login.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Changed CLI Commands

telnet slot *slot-number*

Extension of Ethernet Ring Protection Switching (ERPS) Clear Command

The clear command is described in the *ITU-T G.8032* (*Standard for ERPS*). This command allows the ERPS ring to administratively return (revert) to idle state and trigger (on the owner) the transmission of NR,RB messages that return all other nodes back to the idle state from the pending state. If it is an R-APS (NR, RB) message without a DNF indication, all Ethernet ring nodes perform a necessary flush FDB. In the revertive-mode of operation, after the link failure is cleared in the ring, the traffic channel reverts (the RPL owner node blocks its RPL port and transmits an R-APS (NR, RB) message in both directions, repeatedly) after the expiration of a WTR timer. With the clear command, the traffic channel

can be made to revert without waiting for the WTR to expire. When you issue a clear command for non-revertive mode at the RPL owner node, the non-revertive operation is cleared and the traffic channel is reverted. Upon receiving an R-APS (NR, RB) message, any blocking Ethernet ring node should unblock its non-failed ring port.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Changed CLI Commands

configure **erps** *ring-name* **dynamic-state** [**force-switch** | **manual-switch** | **clear**] **port** *slot:port*

Increase in Open Shortest Path First (OSPFv3) Equal-Cost Multi-path Routing (ECMP) Limit

The limit for Open Shortest Path First (OSPFv3) Equal-Cost Multi-path Routing (ECMP) is increased from 32 to 64 (see Table 5 on page 56).

Supported Platforms

Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X870, X690

Ethernet Automatic Protection Switching (EAPS) Shared Port Capability Added to Advanced Edge License

The Ethernet Automatic Protection Switching (EAPS) "shared port" capability (also known as "common links") is now in the Advanced Edge license. This feature previously required the Core license. The Advanced Edge license now provides all EAPS capabilities, including multiple physical rings.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Enabling/Disabling the USB Port

For enhanced security, you can enable or disable a USB port on a switch. The USB port is enabled by default.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Limitations

Stack support is not available. You need to enable this command individually on each node in a stack.

New CLI Commands

enable switch **usb**

disable switch **usb**

show switch **usb**

Certificate Signing Request

This feature allows you to create certificate signing requests (CSRs)/private key pairs. The CSR can be then be taken to a Certificate Authority (CA) for signing. The CA then provides the signed certificate, which can be downloaded to the switch.

Note

For enhanced security, the minimum private key length is now 2,048 (previously it was 1,024). This length is enforced in both private key/self-signed certificate pairs and private key/CSR pairs.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

New CLI Commands

configure **ssl csr privkeylen** *length* **country** *code* **organization** *org_name* **common-name** *name*

show **ssl csr**

Changed CLI Commands

For enhanced security and to be consistent with the new CSR command, the following existing command now requires the private key length to be a minimum of 2,048 bits (maximum is 4,096):

configure ssl certificate privkeylen *length* **country** *code* **organization** *org_name* **common-name** *name*

Iterative Online Certificate Status Protocol (OCSP) for Intermediate Certificates

In ExtremeXOS 22.3, Online Certificate Status Protocol (OCSP) processes intermediate certificate authority (CA) certificates iteratively, one by one.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

SSHv2 Rekeying Interval

According to cryptanalysis experts, in SSHv2 it is not safe to use the same session key to encrypt data over long periods of time. You could analyze the traffic and compromise the key with enough captured data, so it is advisable to keep changing the session keys after a certain interval.

In ExtremeXOS 22.3, you can set the SSHv2 session rekeying interval by specifying a time interval value and/or amount of transferred data.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

New CLI Commands

configure **ssh2rekey** [**time-interval** [*time_interval* |**none**] |**data-limit** [*data_size* |**default**]]

Changed CLI Commands

The following commands are changed to show rekeying interval information:

show **ssh2**

show management

Federal Information Processing Standards (FIPS) Compliance for Passwords

Federal Information Processing Standards (FIPS) is a collection of standards defined by the United States Federal Government for document process, encryption algorithms, personal identification and verification, as well as many other areas.

To enhance security, in ExtremeXOS 22.3, all passwords in configuration files are saved using AES-256-CBC FIPS-validated encryption.

All commands that use password with the keyword **encrypted** should use a valid, encrypted password. A password is considered a valid, encrypted password if it is generated in ExtremeXOS version 22.1 or later. Any password encrypted by ExtremeXOS 21.x or earlier is not considered a valid, encrypted password in 22.3. This restriction applies to commands executed through CLI and scripts. Any encrypted passwords saved in configuration files are automatically converted to valid, encrypted passwords when upgrading to ExtremeXOS 22.3.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Entity Sensor MIB (RFC-3433) Support Added

ExtremeXOS 22.3 supports the Entity Sensor MIB (RFC-3433). The Entity Sensor MIB contains a single entitySensorValueGroup that contains objects for representing values and status of the SFP/QSFP.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X440-G2, X620, X690 series switches.

Enabling/Disabling DSA and X509v3 Public Key Algorithms

You can selectively enable and disable DSA/RSA X509 public key-based algorithms: ssh-rsa, ssh-dss, x509v3-sign-rsa, x509v3-sign-dss.

By default all the algorithms are enabled.

Supported Platforms

Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X870, X620, X690 series switches.

New CLI Commands

```
configure ssh2 disable {pk-alg [pkalg_name | all]}

configure ssh2 enable {pk-alg [pkalg_name | all]}
```

Changed CLI Commands

The following show command is changed to display DSA/RSA X509 public key-based algorithms information:

```
show ssh2
```

IEEE Forward Error Correction (FEC) Capability

ExtremeXOS 22.3 allows you to enable IEEE Forward Error Correction (FEC) Clause 91 or Clause 74 (exclusively) on a per-port basis regardless of speed/type.

FEC gives the receiver the ability to correct errors without requiring a reverse channel to request retransmission of data, but at the cost of a fixed, higher forward channel bandwidth. Some devices require this to interoperate.

Supported Platforms

ExtremeSwitching X870 and X690 series switches.

New CLI Commands

```
configure ports port_list forward-error-correction [off | on [cl74 |cl91]]

show port port_list forward-error-correction {refresh |no-refresh } port-
number
```

Changed CLI Commands

The following show command is changed to show FEC status information:

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

New Hardware Supported in ExtremeXOS 22.3

This section lists the new hardware supported in ExtremeXOS 22.3:

ExtremeSwitching X690 series switches:
- X690-48x-2q-4c
- X690-48t-2q-4c

Updating the Programmable Logic Firmware on the Summit X440-G2 and ExtremeSwitching X620 Series Switches

You can update the programmable logic firmware components (FPGA and PLD) on the ExtremeSwitching X440-G2 and X620 series switches.

A current update is available for the ExtremeSwitching X440-G2 and X620 series switches that provides the following enhancements
- Enhanced robustness of interface-to-system LEDs and power supply status signals
- Added support for "Repeated Start" mechanism to improve interface to a subset of optics that require it
- Additional power monitoring (ExtremeSwitching X620 only)

If the switch requires an update, the following messages appear during system start-up:

```
<Warn:HAL.Card.Warning> Switch PLD1 firmware is out of date, do 'install firmware' to
update.
<Warn:HAL.Card.Warning> Switch FPGA firmware is out of date, do 'install firmware' to
update.
```

To view the current firmware versions, use the command `show version detail`. The following shows sample output from this command with the firmware version in bold:

```
# show version detail
Switch     : 800624-00-01 1516G-01246 Rev 1.0 BootROM: 1.0.1.7    IMG: 22.3.0.35
             FPGA: 1.1.42.0 PLD1: 1.0.10.0
….
```

New versions included in ExtremeXOS 22.3 are FPGA 1.1.44.0 and PLD 2.0.14.0.

Use the `install firmware` command to update the firmware. Running this command requires a reboot of the switch, which can be performed at any time after the command has completed. For more information about this command, see the *ExtremeXOS 22.3 Command Reference Guide*.

End of Support for Non-persistent Adj-Rib-Out (ARO)

Starting with ExtremeXOS 22.3, support for non-persistent Adj-Rib-Out (ARO) is removed.

Previously, the ExtremeXOS default was "disabled," meaning AROs were non-persistent, and you could use commands to change this default setting. Effective for ExtremeXOS 22.3, the internal setting for

AROs is now persistent, and the following commands are deprecated that were used to control this setting:

- `enable bgp adj-rib-out`
- `disable bgp adj-rib-out`

The output of the `show bgp` command will continue to display the adj-rib-out setting; however, it will always show "enabled" as set by default.

Multiple Spanning Tree Protocol (MSTP) Enabled by Default

Starting with ExtremeXOS 22.2, as part of safe defaults mode, Multiple Spanning Tree Protocol (MSTP) is enabled by default.

When you set up your switch for the first time, you set the safe defaults mode (disables Telnet, STP, and SNMP; and configures other aspects of the switch for enhanced security).

You enter safe defaults mode after you connect to the console port of the switch, or after you run `unconfigure switch {all}` or `configure safe-default-script`. When you enter safe defaults mode, the following prompt appears reminding you that MSTP is enabled by default, which you can disable if desired:

```
This switch currently has some management methods enabled for convenience reasons.
Please answer these questions about the security settings you would like to use.
You may quit and accept the default settings by entering 'q' at any time.

!!!! NOTE: Spanning Tree default changed in ExtremeXOS 22.2 !!!!

Multiple Spanning Tree Protocol (MSTP) is enabled by default to prevent
broadcast storms

Would you like to disable MSTP? [y/N/q]:
```

Vulnerability Notice

We do not believe that ExtremeXOS 22.3 is significantly vulnerable to the "SSL 64-bit Block Size Cipher Suites Supported" (SWEET32) security risk.

SSL: ExtremeXOS uses the thttpd webserver that is not vulnerable to this type of attack because thttpd does not support persistent SSL connections, which is a requirement of the exploit.

SSH: SSH is potentially more vulnerable depending on the ciphers used. However, ExtremeXOS allows you to mitigate this vulnerability by configuring the advertised ciphers.

For more information about the SWEET32 threat, see:

https://sweet32.info

https://www.openssl.org/blog/blog/2016/08/24/sweet32/

Direct Attach Feature No Longer Requires Separate License

The Direct Attach feature, which previously was licensed separately as a feature pack, is now available in the Edge license. No additional license is required to use this feature.

The Direct Attach feature, which is based on the IEEE version of VEPA, eliminates the virtual switch layer, simplifying the network and improving performance. Direct Attach enables data center simplification by reducing network tiers from four or five tiers to just two or three tiers, depending on the size of the data center.

For more information about licenses, see the *ExtremeXOS 22.3 Feature License Requirements*.

Summit X460-G2 Series Switches Have Advanced Edge License

Starting with ExtremeXOS 22.1, Summit X460-G2 series switches have the Advanced Edge License as their default base license level.

For more information about licenses, see *ExtremeXOS 22.3 Feature License Requirements*.

VLAN Option Formatting in Commands

For commands with a **`vlan_list`** option, the input into this option must not contain spaces.

Example

The `enable stpd auto-bind` command VLAN ID input should be entered as:

```
enable stpd s0 auto-bind vlan 10,20-30
```

Not:

```
enable stpd s0 auto-bind vlan 10, 20-30
```

Circuit Emulation Service (CES) No Longer Supported

Starting with ExtremeXOS 21.1, Circuit emulation service (CES) is no longer supported.

OpenFlow and SSH Included in ExtremeXOS Base Image

OpenFlow and SSH are now included in the ExtremeXOS base image starting with ExtremeXOS 21.1. A separate XMOD file is no longer required.

ExtremeXOS SSH Server Upgraded with OpenSSH v6.5

ExtremeXOS 16.1 and earlier versions generated DSA-2048 keys using `ssh keygen` provided by the SSH-Toolkit library. Starting with ExtremeXOS 21.1, ExtremeXOS generates more secure RSA-2048 keys due to switching to using the OpenSSH library, which does not support DSA-2048.

When upgrading to ExtremeXOS 21.1 and later, SSH keys generated by earlier ExtremeXOS versions (16.1 and earlier) are compatible and do *not* need to be re-generated.

> **Note**
>
> If a switch is downgraded from ExtremeXOS 21.1 or later to previous releases, with RSA key saved, the key becomes invalid.

CLI Command Output Format of Ports Lists

For ExtremeXOS 16.1 and later, the output of CLI commands showing ports lists does not display spaces between commas.

For example: "3:1,7:13" instead of "3:1, 7:13"

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 SFPs, XENPAKs, XFPs, and other pluggable interfaces.

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: http://documentation.extremenetworks.com

Compatibility with Extreme Management Center (Formerly NetSight)

ExtremeXOS 22.3 is compatible with Extreme Management Center (formerly NetSight) version 7.1 and later.

Supported MIBs

The Extreme Networks MIBs are located at http://www.extremenetworks.com/support/policies/mibs/.

You need to provide your serial number or agreement number, and then 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 22.3 User Guide*.

Tested Third-Party Products

This section lists the third-party products tested for ExtremeXOS 22.3.

Tested RADIUS Servers

The following RADIUS servers are fully tested:

- Microsoft—Internet Authentication Server
- Meetinghouse
- FreeRADIUS

Tested Third-Party Clients

The following third-party clients are fully tested:

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

PoE Capable VoIP Phones

The following PoE capable VoIP phones are fully tested:

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

Extreme Switch Security Assessment

DoS Attack Assessment

Tools used to assess DoS attack vulnerability:
- Network Mapper (NMAP)

ICMP Attack Assessment

Tools used to assess ICMP attack vulnerability:
- SSPing
- Twinge
- Nuke
- WinFreeze

Port Scan Assessment

Tools used to assess port scan assessment:
- Nessus

Service Notifications

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

2 Limits

This chapter summarizes the supported limits in ExtremeXOS 22.3.

The limits data is grouped by license level that contains the associated features:
- Edge (Table 3 on page 25)
- Advanced Edge (Table 4 on page 50)
- Core (Table 5 on page 56)

For more information about licenses, see *ExtremeXOS 22.3 Feature License Requirements*.

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

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

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

Supported Limits for Edge License

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

Table 3: Supported Limits for Edge License

Metric	Product	Limit
AAA (local)—maximum number of admin and local user accounts.	All platforms	8
Access lists (meters)—maximum number of meters.	ExtremeSwitching X620, X440-G2	1,024 ingress 256 egress
	Summit X770, X670-G2, X450-G2, X460-G2	1,024 ingress 512 egress
	ExtremeSwitching X870, X690	2,048 ingress 512 egress

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Access lists (policies)—suggested maximum number of lines in a single policy file.	All platforms	300,000
Access lists (policies)—maximum number of rules in a single policy file.[a]	Summit X460-G2, X450-G2, X770, X670-G2	4,096 ingress 1,024 egress
	ExtremeSwitching X620, X440-G2	2,048 ingress 512 egress
	ExtremeSwitching X870	3,072 ingress 1,024 egress
	ExtremeSwitching X690	8,192 ingress 1,024 egress
Access lists (policies)—maximum number of rules in a single policy file in first stage (VFP).	Summit X450-G2, X460-G2	2,048 ingress only
	Summit X670-G2, X770, ExtremeSwitching X870, X690	1,024 ingress only
	ExtremeSwitching X620, X440-G2	512 ingress only
Access lists (slices)—number of ACL slices.	Summit X460-G2, X450-G2	16 ingress 4 egress
	Summit X770, X670-G2, ExtremeSwitching X690	12 ingress 4 egress
	ExtremeSwitching X440-G2, X620	8 ingress 4 egress
	ExtremeSwitching X870	4 ingress 4 egress
Access lists (slices)—number of ACL slices in first stage (VFP).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	4 ingress only
ACL Per Port Meters—number of meters supported per port.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	16
ACL port ranges	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	32
Meters Packets-Per-Second Capable	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	Yes
AVB (audio video bridging)—maximum number of active streams.	Summit X450-G2, X460-G2, X770, and ExtremeSwitching X620, X440-G2	1,024
	Summit X670-G2	4,096
	ExtremeSwitching X690	N/A

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
BFD sessions (Software Mode) —maximum number of BFD sessions.	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X440-G2, X620, X870, X690 (default timers—1 sec)	512
	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X440-G2, X620, X870, X690 (minimal timers—100 msec)	10 [c]
BFD IPv4 sessions (Hardware Assisted)—maximum number of IPv4 BFD sessions.	Summit X460-G2, ExtremeSwitching X870, X690	900 (PTP not enabled) 425 (PTP enabled) 256 (with 3 ms transmit interval)
BFD IPv6 sessions (Hardware Assisted)—maximum number of IPv6 BFD sessions.	Summit X460-G2, ExtremeSwitching X870, X690	425 (PTP not enabled)
BOOTP/DHCP relay— maximum number of BOOTP or DHCP servers per virtual router.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	4
BOOTP/DHCP relay— maximum number of BOOTP or DHCP servers per VLAN.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	4
Connectivity fault management (CFM)— maximum number or CFM domains. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	8
CFM—maximum number of CFM associations. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	256
CFM—maximum number of CFM up end points. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	32
CFM—maximum number of CFM down end points. **Note:** With Advanced Edge license or higher.	Summit X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690 Summit X460-G2	32 256 (non-load shared ports) 32 (load shared ports)

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
CFM—maximum number of CFM remote end points per up/down end point. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	2,000
CFM—maximum number of dot1ag ports. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	128
CFM—maximum number of CFM segments. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	1,000
CFM—maximum number of MIPs. **Note:** With Advanced Edge license or higher.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690	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.	Summit X460-G2, X770, X670-G2, X450-G2 ExtremeSwitching X440-G2, X620 ExtremeSwitching X870 ExtremeSwitching X690	4,094 1,024 3,072 8,192
Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)—maximum number of DCBX application TLVs.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	8
DHCPv6 Prefix Delegation Snooping—Maximum number of DHCPv6 prefix delegation snooped entries.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690	256 (with Underlying Protocol Ripng) 128 (with Underlying protocol OSPFv3) 1,024 (with static routes)
DHCP snooping entries—maximum number of DHCP snooping entries.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X440-G2, X870, X690	2,048

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit

Dynamic ACLs—maximum number of ACLs processed per second.
 	
Note: Limits are load dependent.
	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690
	
	    with 50 DACLs
	    with 500 DACLs
		
		10
		5

EAPS domains—maximum number of EAPS domains. **Note:** An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains. **Note:** You can increase the number of domains by upgrading to the Advanced Edge license (see Table 4 on page 50).	Summit X670-G2, X450-G2, X460-G2, X770,and ExtremeSwitching X440-G2, X620, X870, X690	4
EAPSv1 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2 ExtremeSwitching X870, X690	1,000 2,000
ERPS domains—maximum number of ERPS domains with or without CFM configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	4
ERPSv1 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 ExtremeSwitching X620, X440-G2	2,000 1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 ExtremeSwitching X620, X440-G2	2,000 500
ELSM (vlan-ports)—maximum number of VLAN ports.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690 ExtremeSwitching X440-G2	5,000 4,000
Forwarding rate—maximum L3 software forwarding rate.	ExtremeSwitching X870, X690 Summit X450-G2 Summit X460-G2 ExtremeSwitching X440-G2 ExtremeSwitching X620 Summit X770-32q Summit X670-G2	34,000 pps 18,000 pps 19,000 pps 10,000 pps 13,000 pps 8,000 pps 14,000 pps

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
FDB (unicast blackhole entries)—maximum number of unicast blackhole FDB entries.	Summit X460-G2	49,152 [f]
	Summit X770, X670-G2	294,912 [f]
	Summit X450-G2	34,816 [f]
	ExtremeSwitching X620, X440-G2	16,384 [f]
	ExtremeSwitching X870	139,264 [f]
	ExtremeSwitching X690	278,528 [f]
FDB (multicast blackhole entries)—maximum number of multicast blackhole FDB entries.	Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	1,024
	Summit X770, X670-G2, ExtremeSwitching X870, X690	4,096
FDB (maximum L2 entries)—maximum number of MAC addresses.	Summit X460-G2	98,300 [g]
	Summit X770, X670-G2	294,912 [g]
	Summit X450-G2	68,000 [g]
	ExtremeSwitching X620, X440-G2	16,384
	ExtremeSwitching X870	139,264 [g]
	ExtremeSwitching X690	278,528 [g]
FDB (Maximum L2 entries)—maximum number of multicast FDB entries.	Summit X770, X670-G2, ExtremeSwitching X870, X690	4,096
	Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	1,024
Identity management—maximum number of Blacklist entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	512
Identity management—maximum number of Whitelist entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	512
Identity management—maximum number of roles that can be created.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	64
Identity management—maximum role hierarchy depth allowed.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	5
Identity management—maximum number of attribute value pairs in a role match criteria.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	16
Identity management—maximum of child roles for a role.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
Identity management—maximum number of policies/ dynamic ACLs that can be configured per role.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Identity management— maximum number of LDAP servers that can be configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
Identity management— maximum number of Kerberos servers that can be configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	20
Identity management— maximum database memory-size.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	512
Identity management— recommended number of identities per switch. **Note:** Number of identities per switch is for a default identity management database size (512 Kbytes) across all platforms.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	100
Identity management— recommended number of ACL entries per identity. **Note:** Number of ACLs per identity based on system ACL limitation.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	20
Identity management— maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	500
IGMP snooping per VLAN filters—maximum number of VLANs supported in per-VLAN IGMP snooping mode.	Summit X460-G2, ExtremeSwitching X870 Summit X450-G2 Summit X770, X670-G2 ExtremeSwitching X620, X440-G2 ExtremeSwitching X690	1,500 2,048 2,000 1,000 4,000
IGMPv1/v2 SSM-map entries— maximum number of IGMPv1/v2 SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	500
IGMPv1/v2 SSM-map entries— maximum number of sources per group in IGMPv1/v2 SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	50

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per port.[n]	Summit X770, X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690	6,000
IGMPv2 subscriber—maximum number of IGMPv2 subscribers per switch.[n]	Summit X770, X670-G2	30,000
	Summit X460-G2, X450-G2	20,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690	45,000
IGMPv3 maximum source per group—maximum number of source addresses per group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	250
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per port.[n]	Summit X770, X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X870, X690	6,000
IGMPv3 subscriber—maximum number of IGMPv3 subscribers per switch.[n]	Summit X460-G2, X450-G2	20,000
	Summit X770, X670-G2	30,000
	ExtremeSwitching X620, X440-G2	17,500
	ExtremeSwitching X870, X690	45,000
IP ARP entries in software—maximum number of IP ARP entries in software. **Note:** May be limited by hardware capacity of FDB (maximum L2 entries).	Summit X670-G2, X770	131,072 (up to)[h]
	Summit X460-G2	57,344 (up to)[h]
	Summit X450-G2	47,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	20,480
	ExtremeSwitching X870	94,206 (up to)[h]
	ExtremeSwitching X690	157,694 (up to)[h]
IPv4 ARP entries in hardware with minimum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. Assumes number of IP route reserved entries is 100 or less.	ExtremeSwitching X870	74,000 (up to)[h]
	Summit X460-G2	50,000 (up to)[h]
	Summit X770, X670-G2	108,000 (up to)[h]
	Summit X450-G2	39,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690	122,000 (up to)[h]

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv4 ARP entries in hardware with maximum LPM routes—maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. Assumes number of IP route reserved entries is "maximum."	ExtremeSwitching X870	64,000 (up to)[h]
	Summit X460-G2	43,000 (up to)[h]
	Summit X770, X670-G2	98,000 (up to)[h]
	Summit X450-G2	29,000 (up to)[h]
	ExtremeSwitching X620	1,500
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X690	112,000 (up to) [h]
IP flow information export (IPFIX)—number of simultaneous flows.	Summit X460-G2	2,048 ingress 2,048 egress
	Summit X450-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	N/A
IPv4 remote hosts in hardware with zero LPM routes—maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. Assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less.	ExtremeSwitching X870	120,000 (up to)[h]
	Summit X460-G2	73,000 [h]
	Summit X770, X670-G2	176,000 (up to)[h]
	Summit X450-G2	61,000 (up to)[h]
	ExtremeSwitching X440-G2, X620	3,500
	ExtremeSwitching X690	216,000 (up to) [h]
IPv4 routes—maximum number of IPv4 routes in software (combination of unicast and multicast routes), including static and from all routing protocols.	Summit X460-G2, X450-G2, X440-G2, X620	25,000
	Summit X670-G2, ExtremeSwitching X690	262,144
	Summit X770	100,000
	ExtremeSwitching X870	196,608
IPv4 routes (LPM entries in hardware)— number of IPv4 routes in hardware.	Summit X460-G2	12,000
	Summit X450-G2	16,000
	Summit X670-G2, X770, ExtremeSwitching X690	131,000 min. up to 262,000 [q]
	ExtremeSwitching X870	131,000 min. up to 196,000 [q]
	ExtremeSwitching X620, X440-G2	480
IPv6 6in4 tunnel—maximum number of IPv6 6in4 tunnels.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	255
	ExtremeSwitching X440-G2, X620	N/A
IPv6 6to4 tunnel—maximum number of IPv6 6to4 tunnels.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	1 (per virtual router)
	ExtremeSwitching X440-G2, X620	N/A

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
IPv6 addresses on an interface—maximum number of IPv6 addresses on an interface.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	255
IPv6 addresses on a switch—maximum number of IPv6 addresses on a switch.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690	2,048
	ExtremeSwitching X620, X440-G2	510
IPv6 host entries in hardware—maximum number of IPv6 neighbor entries in hardware.	Summit X770, X670-G2	36,750 [h]
	Summit X460-G2	22,000 [h]
	Summit X450-G2	12,000 [h]
	ExtremeSwitching X440-G2	1,000
	ExtremeSwitching X620	1,500
	ExtremeSwitching X870, X690	32,000 [h]
IPv6 routes (LPM entries in hardware)—maximum number of IPv6 routes in hardware.	Summit X460-G2	6,000
	Summit X450-G2	8,000
	Summit X670-G2, X770, ExtremeSwitching X690	86,000 min. up to 131,000 [h]
	ExtremeSwitching X870	65,000 [h]
	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 X620, X440-G2, X870	256
	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X690	2,048
IPv6 route sharing in hardware—route mask lengths for which ECMP is supported in hardware. **Note:** * >64 single path only	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X620, X870, X690	0–64 *
	ExtremeSwitching X440-G2	Not supported
IPv6 routes in software—maximum number of IPv6 routes in software, including static routes and routes from all routing protocols.	Summit X450-G2, X460-G2, and ExtremeSwitching X620, X440-G2	25,000
	Summit X670-G2, ExtremeSwitching X690	131,000
	Summit X770	100,000
	ExtremeSwitching X870	65,000
IP router interfaces—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	Summit X460-G2, X770, X670-G2, X450-G2, ExtremeSwitching X870, X690	2,048
	ExtremeSwitching X620, X440-G2	510
IP multicast static routes—maximum number of permanent multicast IP routes.	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X870, X690	1,024

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
IP unicast static routes—maximum number of permanent IP unicast routes.	Summit X460-G2, X670-G2, X450-G2, X770, ExtremeSwitching X870, X690	1,024
	ExtremeSwitching X620, X440-G2	480
IP route sharing (maximum gateways)—Configurable maximum number of gateways used by equal cost multipath OSPF, BGP, IS-IS, static routes, or L2VPNs. Static routes, OSPF, and BGP are limited to 64 ECMP gateways per destination, while IS-IS is limited to 8. L2VPNs are limited to 16 LSPs per pseudowire on platforms that support 32 gateways, and 64 LSPs per pseudowire on platforms that support 64 gateways.	Summit X460-G2, X670-G2, X450-G2, X770, and ExtremeSwitching X620, X870, X690	2, 4, 8, 16, 32, or 64
	ExtremeSwitching X440-G2	N/A
IP route sharing (total combinations of gateway sets)—maximum number of combinations of sets of adjacent gateways used by multipath OSPF, BGP, IS-IS, or static routes.	Summit X670-G2, X770, ExtremeSwitching X870. X690 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	 1,022 1,022 1,022 1,022 510 254
	Summit X460-G2, X450-G2 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64	 1,022 1,022 510 254 126 62
	ExtremeSwitching X620 if maximum gateways is 2 if maximum gateways is 4 if maximum gateways is 8 if maximum gateways is 16 (default) if maximum gateways is 32 if maximum gateways is 64 ExtremeSwitching X440-G2	 126 126 126 126 62 30 N/A
IP multinetting (secondary IP addresses)—maximum number of secondary IP addresses per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	255

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Jumbo frames—maximum size supported for jumbo frames, including the CRC.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	9,216
L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch—maximum number of VCCV enabled VPLS VPNs.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	16
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: VPLS MAC addresses—maximum number of MAC addresses learned by a switch.	Summit X770	128,000
	Summit X670-G2, ExtremeSwitching X690	140,000
	Summit X460-G2	55,000
	ExtremeSwitching X870	65,000
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: VPLS VPNs—maximum number of VPLS virtual private networks per switch.	Summit X460-G2, X770, X670-G2, ExtremeSwitching X870, X690	1,023
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: VPLS peers—maximum number of VPLS peers per VPLS instance.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	64
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: LDP pseudowires—maximum number of pseudowires per switch.	Summit X770	7,800
	Summit X670-G2, X460-G2, and ExtremeSwitching X870, X690	7,000
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: static pseudowires—maximum number of static pseudowires per switch.	Summit X670-G2, X460-G2, X770, ExtremeSwitching X870, X690	7,000
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A
L2 VPN: Virtual Private Wire Service (VPWS) VPNs—maximum number of virtual private networks per switch.	Summit X770	4,000
	Summit X670-G2, ExtremeSwitching X870, X690	4,090
	Summit X460-G2	1,023
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	N/A

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. **Note:** • The internal lookup table configuration used is "l2-and-l3". • IPv6 and IPv4 L2 IPMC scaling is the same for this mode. • Layer-2 IPMC forwarding cache limits— (IGMP/MLD/PIM snooping) in mixed-mode are same.	Summit X770, X670-G2	73,000
	Summit X460-G2	24,000
	Summit X450-G2	14,000
	ExtremeSwitching X620, X440-G2	5,000
	ExtremeSwitching X870	36,000
	ExtremeSwitching X690	67,000
Layer-3 IPv4 Multicast— maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). **Note:** • Limit value same for MVR senders, PIM Snooping entries. PIM SSM cache, IGMP senders, PIM cache. • The internal lookup table configuration used is "more l3-and-ipmc". • Assumes source-group-vlan mode as look up key. • Layer 3 IPMC cache limit in mixed mode also has the same value.	Summit X460-G2	26,000
	Summit X450-G2	21,000
	Summit X770, X670-G2	77,500
	ExtremeSwitching X620, X440-G2	1,500
	ExtremeSwitching X870	52,000
	ExtremeSwitching X690	93,000

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Layer-3 IPv6 Multicast—maximum number of <S,G,V> entries installed in the hardware (IP multicast compression enabled). **Note:** • Limit value same for MLD sender per switch,PIM IPv6 cache. • The internal lookup table configuration used is "more l3-and-ipmc". • Assumes source-group-vlan mode as look up key.	Summit X770, X670-G2	30,000
	Summit X460-G2	14,000
	Summit X450-G2	10,000
	ExtremeSwitching X620, X440-G2	700
	ExtremeSwitching X870	18,000
	ExtremeSwitching X690	48,000
Load sharing—maximum number of load sharing groups. **Note:** The actual number of load-sharing groups that can be configured is limited by the number of physical ports present in the switch or SummitStack.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	128
Load sharing—maximum number of ports per load-sharing group.	For standalone and stacked: ExtremeSwitching X620, X440-G2	8
	For standalone: Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690	32
	For stacked: Summit X770, X670-G2, X460-G2, X450-G2, X670-G2, and ExtremeSwitching X870, X690	64
Logged messages—maximum number of messages logged locally on the system.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	20,000
MAC-based security—maximum number of MAC-based security policies.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1,024
MAC Locking—Maximum number of MAC locking stations that can be learned on a port.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	64 (static MAC locking stations) 600 (first arrival MAC locking stations)
Meters—maximum number of meters supported.	Summit X460-G2, X450-G2, X670-G2, X770, ExtremeSwitching X440-G2, X620, X870, X690	2,048

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Maximum mirroring instances	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690 **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. So this allows the you to use a total of four slots, while there are no more then two egress instances. The maximum possible combination for mirroring instances: 1 4 ingress 2 3 ingress + 1 egress 3 2 ingress + 2 egress 4 2 (ingress + egress) 5 1 (ingress + egress) + 2 ingress 6 1 (ingress + egress) + 1 egress + 1 ingress	16 (including default mirroring instance)
Mirroring (filters)—maximum number of mirroring filters. **Note:** This is the number of filters across all the active mirroring instances.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	128
Mirroring, one-to-many (filters)—maximum number of one-to-many mirroring filters. **Note:** This is the number of filters across all the active mirroring instances	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	128
Mirroring, one-to-many (monitor port)—maximum number of one-to-many monitor ports.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	16
MLAG ports—maximum number of MLAG ports allowed.	Summit X670-G2, ExtremeSwitching X690	71
	ExtremeSwitching X440-G2, Summit X450-G2	51
	Summit X460-G2	53
	Summit X770	103
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
MLAG peers—maximum number of MLAG peers allowed.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	2

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
MPLS RSVP-TE interfaces—maximum number of interfaces.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	32
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE ingress LSPs—maximum number of ingress LSPs.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE egress LSPs—maximum number of egress LSPs.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE transit LSPs—maximum number of transit LSPs.	Summit X460-G2, X670-G2, X770	2,000
	ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE paths—maximum number of paths.	Summit X460-G2, X770	1,000
	Summit X670-G2, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE profiles—maximum number of profiles.	Summit X460-G2, X770	1,000
	Summit X670-G2, ExtremeSwitching X870, X690	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS RSVP-TE EROs—maximum number of EROs per path.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	64
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP peers—maximum number of MPLS LDP peers per switch.	Summit X770	64
	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690	128
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP adjacencies—maximum number of MPLS LDP adjacencies per switch.	Summit X460-G2	50
	Summit X770, X670-G2, ExtremeSwitching X870, X690	64
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP ingress LSPs—maximum number of MPLS LSPs that can originate from a switch.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	2,048
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP-enabled interfaces—maximum number of MPLS LDP configured interfaces per switch.	Summit X770	64
	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690	128
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS LDP transit LSPs—maximum number of MPLS transit LSPs per switch.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
MPLS LDP egress LSPs— maximum number of MPLS egress LSPs that can terminate on a switch.	Summit X670-G2, X460-G2, X770, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS static egress LSPs— maximum number of static egress LSPs.	Summit X460-G2	7,116
	Summit X770, ExtremeSwitching X870, X690	8,000
	Summit X670-G2	15,308
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS static ingress LSPs— maximum number of static ingress LSPs.	Summit X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X770, X670-G2	2,048
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
MPLS static transit LSPs— maximum number of static transit LSPs	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
Multicast listener discovery (MLD) snooping per-VLAN filters—maximum number of VLANs supported in per-VLAN MLD snooping mode.	Summit X460-G2, X770, X670-G2, ExtremeSwitching X870	1,200
	Summit X450-G2	512
	ExtremeSwitching X620, X440-G2	600
	ExtremeSwitching X690	1,500
Multicast listener discovery (MLD)v1 subscribers— maximum number of MLDv1 subscribers per port.[n]	Summit X770, X670-G2, X450-G2, X460-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690	6,000
Multicast listener discovery (MLD)v1 subscribers— maximum number of MLDv1 subscribers per switch.[n]	Summit X460-G2, X450-G2, ExtremeSwitching X620, X440-G2	10,000
	Summit X770, X670-G2	30,000
	ExtremeSwitching X870, X690	45,000
Multicast listener discovery (MLD)v2 subscribers— maximum number of MLDv2 subscribers per port.[n]	Summit X770, X670-G2, X460-G2, X450-G2	4,000
	ExtremeSwitching X620, X440-G2	3,500
	ExtremeSwitching X870, X690	6,000
Multicast listener discovery (MLD)v2 subscribers— maximum number of MLDv2 subscribers per switch.[n]	Summit X770, X670-G2	30,000
	Summit X460-G2, X450-G2, ExtremeSwitching X620, X440-G2	10,000
	ExtremeSwitching X870, X690	45,000
Multicast listener discovery (MLD)v2 maximum source per group—maximum number of source addresses per group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	200

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Multicast listener discovery (MLD) SSM-map entries—maximum number of MLD SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	500
	ExtremeSwitching X440-G2, X620	50
Multicast listener discovery (MLD) SSM-MAP entries—maximum number of sources per group in MLD SSM mapping entries.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	50
Network Login—maximum number of clients being authenticated on MAC-based VLAN enabled ports.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1,024
Network Login—maximum number of clients being authenticated with policy mode enabled.	Summit X450-G2, X460-G2	1,024
	Summit X670-G2, X770, ExtremeSwitching X870, X690	512
	ExtremeSwitching X620, X440-G2	256
Network Login—maximum number of dynamic VLANs.	Summit X460-G2, X450-G2, X670-G2, X770, ExtremeSwitching X870, X690	2,000
	ExtremeSwitching X440-G2, X620	1,024
Network Login VLAN VSAs—maximum number of VLANs a client can be authenticated on at any given time.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	10
Node Alias—maximum number of entires per slot.	Summit X450-G2, X460-G2, X670-G2, X770 and ExtremeSwitching X620, X440-G2, X870, X690	8,192
ONEPolicy Roles/Profiles—maximum number of policy roles/profiles.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	63
ONEPolicy Rules per Role/ Profile—maximum number of rules per role/policy.	Summit X450-G2, X460-G2	IPv6 rules: 256 IPv4 rules: 256 L2 Rules: 184 MAC Rules: 256
	Summit X670-G2, X770, ExtremeSwitching X870	IPv6 Rules: 256 L2 Rules: 184 MAC Rules: 256 IPv4 Rules: 256
	ExtremeSwitching X620, X440-G2	IPv6 and Mac Rules: 0 Ipv4 Rules: 256 (per switch) L2 Rules: 184 (per switch)
	ExtremeSwitching X690	IPv4 Rules: 512 IPv6 Rules: 512 MAC Rules: 512 L2 Rules: 440

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
ONEPolicy Authenticated Users per Switch—maximum number of authenticated users per switch.	Summit X450-G2, X460-G2	Up to 1,024
	Summit X670-G2, X770, ExtremeSwitching X870, X690	Up to 512
	ExtremeSwitching X620, X440-G2	Up to 256
ONEPolicy Authenticated Users— maximum authenticated users with a combination of TCI disabled/enabled profiles.	Summit X450-G2, X460-G2	682–1,024
	Summit X670-G2, X770, ExtremeSwitching X870	341–512
	ExtremeSwitching X620, X440-G2	TCI disabled: 170 TCI enabled: 256
	ExtremeSwitching X690	TCI enabled: 512 TCI disabled: 341
ONEPolicy Authenticated Users per Port—maximum number of authenticated users per port.	Summit X450-G2, X460-G2	Unlimited up to 1,024
	Summit X670-G2, X770, ExtremeSwitching X870, X690	Unlimited up to 512
	ExtremeSwitching X620, X440-G2	Unlimited up to 256
ONEPolicy Permit/Deny Traffic Classification Rules Types—total maximum number of unique permit/deny traffic classification rules types (system/stack).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	952
	ExtremeSwitching X620, X440-G2	440
	ExtremeSwitching X690	1,976
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique MAC permit/deny traffic classification rules types (macsource/macdest).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690	512
ONEPolicy Permit/Deny Traffic Classification Rules Types—maximum number of unique IPv6 permit/deny traffic classification rules types (ipv6dest).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	256
	ExtremeSwitching X620, X440-G2	N/A
	ExtremeSwitching X690	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).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X620, X440-G2, X870	256
	ExtremeSwitching X690	512

Table 3: 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).	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870	184
	ExtremeSwitching X620, X440-G2	184
	ExtremeSwitching X690	440
Policy-based routing (PBR) redundancy—maximum number of flow-redirects.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	256°
Policy-based routing (PBR) redundancy—maximum number of next hops per each flow-direct.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	32°
Private VLANs—maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN.	Summit X770	103
	Summit X670-G2	63
	Summit X460-G2	53
	Summit X450-G2	51
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X620	15
	ExtremeSwitching X870	127
	ExtremeSwitching X690	71
Private VLANs—maximum number of private VLANs with an IP address on the network VLAN. **Note:** This limit is dependent on the maximum number of private VLANs in an L2-only environment if the configuration has tagged and translated ports.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690	1,024
	ExtremeSwitching X440-G2	255
	ExtremeSwitching X620	510
Private VLANs—maximum number of private VLANs in an L2-only environment.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690	1,280
	ExtremeSwitching X440-G2, X620	255
PTP/1588v2 Clock Ports	Summit X770, X460-G2, X670-G2	32 for boundary clock 1 for ordinary clock
	ExtremeSwitching X440-G2, X620, X870, X690	N/A

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
PTP/1588v2 Clock Instances	Summit X770, X670-G2, X460-G2	2 combinations: • Transparent clock + ordinary clock • Transparent clock + boundary clock
	ExtremeSwitching X440-G2, X620, X870, X690	N/A
PTP/1588v2 Unicast Static Slaves	Summit X770, X670-G2, X460-G2	40 entries per clock port
	ExtremeSwitching X440-G2, X620, X870, X690	N/A
PTP/1588v2 Unicast Static Masters	Summit X770, X670-G2, X460-G2	10 entries per clock type
	ExtremeSwitching X440-G2, X620, X870, X690	N/A
Route policies—suggested maximum number of lines in a route policy file.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	10,000
RIP Learned Routes—maximum number of RIP routes supported without aggregation.	Summit X770, X670-G2, X460-G2, and ExtremeSwitching X440-G2, X620, X870, X690	10,000
RIP interfaces on a single router—recommended maximum number of RIP routed interfaces on a switch.	Summit X670-G2, X460-G2, X770, X450-G2, ExtremeSwitching X870, X690	256
	ExtremeSwitching X440-G2, X620	128
RIPng learned routes—maximum number of RIPng routes.	Summit X670-G2, X460-G2, X770, X450-G2, X870, X690	3,000
	ExtremeSwitching X440-G2, X620	N/A
Spanning Tree (maximum STPDs)—maximum number of Spanning Tree Domains on port mode EMISTP.	Summit X450-G2, X770, X670-G2, X460-G2, and ExtremeSwitching X620, X870, X690	64
	ExtremeSwitching X440-G2	32

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Spanning Tree PVST+—maximum number of port mode PVST domains. **Note:** For all platforms, the maximum number of active ports per PVST domain depends on the maximum number of spanning tree ports supported on given platform. For example, Summit X670-G2 supports 256 PVST domains (maximum), and 4,096 STP ports (maximum), so the maximum number of active ports per PVST domain would be 16 ports (4,096 ÷ 256).	Summit X770, X670-G2, and ExtremeSwitching X620 Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2 ExtremeSwitching X870, X690	256 128 384
Spanning Tree—maximum number of multiple spanning tree instances (MSTI) domains.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690 ExtremeSwitching X440-G2	64 32
Spanning Tree—maximum number of VLANs per MSTI. **Note:** Maximum number of 10 active ports per VLAN when all 500 VLANs are in one MSTI.	Summit X770, X670-G2 Summit X460-G2, X450-G2, ExtremeSwitching X620, X870, X690 ExtremeSwitching X440-G2	500 600 256
Spanning Tree—maximum number of VLANs on all MSTP instances.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X620, X870, X690 ExtremeSwitching X440-G2	1,024 512
Spanning Tree (802.1d domains)—maximum number of 802.1d domains per port.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1
Spanning Tree (number of ports)—maximum number of ports including all Spanning Tree domains.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690 ExtremeSwitching X440-G2	4,096 2,048
Spanning Tree (maximum VLANs)—maximum number of STP-protected VLANs (dot1d and dot1w).	Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X620, X870, X690 ExtremeSwitching X440-G2	1,024 500
SSH (number of sessions)—maximum number of simultaneous SSH sessions.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
Static MAC multicast FDB entries—maximum number of permanent multicast MAC entries configured into the FDB.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1,024
Syslog servers—maximum number of simultaneous Syslog servers that are supported.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	16
Syslog targets—maximum number of configurable Syslog targets.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	16
Telnet (number of sessions)—maximum number of simultaneous Telnet sessions.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
Virtual routers—maximum number of user-created virtual routers that can be created on a switch.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690 ExtremeSwitching X440-G2, X620	63 N/A
Virtual router forwarding (VRFs)—maximum number of VRFs that can be created on a switch. **Note:** * Subject to other system limitations.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690 ExtremeSwitching X440-G2, X620	960 * N/A
Virtual router protocols per VR—maximum number of routing protocols per VR.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690 ExtremeSwitching X440-G2, X620	8 N/A
Virtual router protocols per switch—maximum number of VR protocols per switch.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690 ExtremeSwitching X440-G2, X620	64 N/A
VLAN aggregation—maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1,000
VLANs—includes all VLANs. **Note:** ExtremeXOS supports only 4,092 user-configurable VLANs. (VLAN 1 is the default VLAN, and 4,095 is the management VLAN, and you may not configure them.)	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	4,094

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
VLANs (Layer 2)—maximum number of Layer 2 VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	4,094
VLANs (Layer 3)—maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.	Summit X460-G2, X770, X670-G2, X450-G2, ExtremeSwitching X870, X690	2,048
	ExtremeSwitching X440-G2, X620	510
VLANs (maximum active port-based)—maximum active ports per VLAN when 4,094 VLANs are configured with default license.	Summit X670-G2, ExtremeSwitching X870, X690	32
	ExtremeSwitching X440-G2	28
	Summit X460-G2, X770	26
	ExtremeSwitching X620	16
	Summit X450-G2	29
	Summit X460-G2	24
VLANs (maximum active protocol-sensitive filters)—number of simultaneously active protocol filters in the switch.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2. X870, X690	16
VLAN translation—maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.	Summit X770	103
	Summit X670-G2	63
	Summit X460-G2	53
	Summit X450-G2	51
	ExtremeSwitching X620	15
	ExtremeSwitching X440-G2	47
	ExtremeSwitching X870	127
	ExtremeSwitching X690	71
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 has tagged and translated ports.	Summit X770, X670-G2, X450-G2, ExtremeSwitching X870, X690	1,024
	ExtremeSwitching X620	512
	ExtremeSwitching X440-G2	255
VLAN translation—maximum number of translation VLAN pairs in an L2-only environment.	Summit X460-G2, ExtremeSwitching X870, X690	2,046
	Summit X450-G2, X770, X670-G2	1,024
	ExtremeSwitching X440-G2, X620	512

Table 3: Supported Limits for Edge License (continued)

Metric	Product	Limit
XML requests—maximum number of XML requests per second. **Note:** Limits are dependent on load and type of XML request. These values are dynamic ACL data requests.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X440-G2, X620, X870, X690	10 with 100 DACLs
XNV authentication—maximum number of VMs that can be processed (combination of local and network VMs).	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690 Summit X450-G2, and ExtremeSwitching X440-G2, X620	2,048 1,024
XNV database entries—maximum number of VM database entries (combination of local and network VMs).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	16,000
XNV database entries—maximum number of VPP database entries (combination of local and network VPPs).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	2,048
XNV dynamic VLAN—Maximum number of dynamic VLANs created (from VPPs / local VMs).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	2,048
XNV local VPPs—maximum number of XNV local VPPs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	2,048 ingress 512 egress
XNV policies/dynamic ACLs—maximum number of policies/dynamic ACLs that can be configured per VPP.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8 ingress 4 egress
XNV network VPPs—maximum number of XNV network VPPs.[p]	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	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 4: Supported Limits for Advanced Edge License

Metric	Product	Limit
EAPS domains—maximum number of EAPS domains. **Note:** An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains.	ExtremeSwitching X870, X690	128
	Summit X670-G2, X450-G2, X460-G2, X770	64
	ExtremeSwitching X440-G2, X620	32
EAPSv2 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X620	500
	ExtremeSwitching X870, X690	2,000
ERPS domains—maximum number of ERPS domains without CFM configured.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	32
ERPS domains—maximum number of ERPS domains with CFM configured.	Summit X450-G2, X670-G2, X770, and ExtremeSwitching X620, X870, X690	16
	Summit X460-G2	32
ERPSv1 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	2,000
	ExtremeSwitching X620, X440-G2	1,000
ERPSv2 protected VLANs—maximum number of protected VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	2,000
	ExtremeSwitching X620, X440-G2	500
ESRP groups—maximum number of ESRP groups	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X440-G2, X620, X870, X690	32
ESRP domains—maximum number of ESRP domains.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	64
ESRP VLANs—maximum number of ESRP VLANs.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1,000
ESRP (maximum ping tracks)—maximum number of ping tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
ESRP (IP route tracks)—maximum IP route tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
ESRP (VLAN tracks)—maximum number of VLAN tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	1

Table 4: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690	64
	ExtremeSwitching X620	4
	ExtremeSwitching X440-G2	N/A
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	8
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690	10,000
	Summit X770, X670-G2, X460-G2	5,000
	Summit X450-G2, ExtremeSwitching 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	4,000
	Summit X670-G2, X460-G2, X770	2,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	1,000
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	4
OSPFv2 links—maximum number of links in the router LSA.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690	400
	Summit X450-G2, and ExtremeSwitching X620, X440-G2	4
	Summit X770	419
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	128
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	4
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690	100
	Summit X770, X670-G2, X460-G2	50
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	32
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	4

Table 4: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690	100
	Summit X460-G2, X670-G2, X770	16
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv3 external routes— recommended maximum number of external routes.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	10,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	1,200
OSPFv3 inter- or intra-area routes— recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690	4.000
	Summit X770, X670-G2, X460-G2	3,000
	Summit X450-G2, ExtremeSwitching X440-G2, X620	500
OSPFv3 interfaces—maximum number of OSPFv3 interfaces.	Summit X770, X670-G2, X460-G2, X450-G2, ExtremeSwitching X870, X690	4
	ExtremeSwitching X440-G2, X620	N/A
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	64
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	16
	Summit X450-G2, ExtremeSwitching X440-G2, X620	4
OVSDB Manager Connections— Maximum number of connections to managers that can be configured (either of TCP, PTCP, SSL, or PSSL).	Summit X770, X670-G2, ExtremeSwitching X870, X690	8
	Smmit X450-G2	N/A
OVSDB Managed Switches— Maximum number of OVSDB- managed switches.	Summit X770, X670-G2, ExtremeSwitching X870, X690	1
	Smmit X450-G2	N/A
PIM IPv4 (maximum interfaces)— maximum number of PIM active interfaces.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X440-G2, X620, X690	4
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	3,000 (depends on policy file limits)

Table 4: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
PIM IPv4 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690	5,000
	ExtremeSwitching X440-G2, X620	1,500
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	145
PIM IPv4 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X440-G2, X620, X690	4
PIM IPv6 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	2,500
	Summit X450-G2	2,000
	ExtremeSwitching X440-G2, X620	550
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	64
PIM IPv6 Limits—maximum number of secondary address per interface.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	70
PIM IPv6 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	32
Port-specific VLAN tags—maximum number of port-specific VLAN tags.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	1,023
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A
Port-specific VLAN tags—maximum number of port-specific VLAN tag ports.	Summit X770, X670-G2	6,400
	Summit X460-G2, ExtremeSwitching X870, X690	4,000
	Summit X450-G2, and ExtremeSwitching X440-G2, X620	N/A

Table 4: Supported Limits for Advanced Edge License (continued)

Metric	Product	Limit
VRRP (v2/v3-IPv4) (maximum instances)—maximum number of VRRP instances for a single switch, with Advanced Edge license or higher. Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs):	
	Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690	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) Note: These limits are applicable for Fabric Routing configuration also. Note: Number of groups configured should not exceed the number of individual VRs supported (that is, in normal mode) for that platform type.	Normal Mode (as individual VRs):	
	Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690	511
	ExtremeSwitching X440-G2, X620	128
	Scaled Mode (with groups):	
	Summit X770, X670-G2, X460-G2, X450-G2, and ExtremeSwitching X870, X690	2,048
	ExtremeSwitching X440-G2, X620	128
VRRP (v2/v3-IPv4/IPv6) (maximum VRID)—maximum number of unique VRID numbers per switch.	Summit X770, X670-G2, X460-G2, X450-G2 and ExtremeSwitching X440-G2, X620, X870, X690 Note: With Advanced Edge license or higher	255
VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)—maximum number of VRIDs per VLAN.	Summit X770, X670-G2, X460-G2, X450-G2 and ExtremeSwitching X440-G2, X620, X870, X690 Note: With Advanced Edge license or higher	255
VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)—maximum number of ping tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690 Note: With Advanced Edge license or higher	8

Table 4: 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.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8 (20 centisecond or 1 second hello interval)
VRRP (v3-IPv6) (maximum ping tracks)—maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8 (20 centisecond or 1 second hello interval)
VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)—maximum number of IP route tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
VRRP (v2/v3-IPv4/IPv6)—maximum number of VLAN tracks per VLAN.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X620, X440-G2, X870, X690	8
VXLAN—maximum virtual networks. **Note:** Every VPLS instance/PSTag VLAN reduces this limit by 1. Assumption is all BUM (broadcast/unknown-unicast/multicast) FDB entries are pointing to the same set of RTEPs when all VNETs use explicit flooding. Depends on whether all VNETs use standard or explicit and the number of tenant VLAN ports.	Summit X670-G2, X770, and ExtremeSwiching X870, X690 Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	2,048–4,000 N/A
VXLAN—maximum tenant VLANs plus port combinations **Note:** Every (VPLS/PSTag VLAN) + port reduces the limit by 1.	Summit X670-G2, X770, and ExtremeSwiching X870, X690 Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	4,096 N/A
VXLAN—maximum static MAC to IP bindings. **Note:** Every FDB entry configured reduces this limit by 1.	Summit X670-G2, X770, and ExtremeSwiching X870, X690 Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	64,000 N/A
VXLAN—maximum RTEP IP addresses	Summit X670-G2, X770, and ExtremeSwitching X870, X690 Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	512 N/A
VXLAN—maximum virtual networks with dynamic learning and OSPF extensions for VXLAN	Summit X670-G2, X770, and ExtremeSwitching X870, X690 Summit X460-G2, X450-G2, and ExtremeSwitching X440-G2, X620	4,000 N/A

Supported Limits for Core License

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

Table 5: Supported Limits for Core License

Metric	Product	Limit
BGP (aggregates)—maximum number of BGP aggregates.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	256
	Summit X450-G2	204
BGP (networks)—maximum number of BGP networks.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	1,024
	Summit X450-G2	820
BGP (peers)—maximum number of BGP peers. **Note:** With default keepalive and hold timers.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	128
	Summit X450-G2	100
BGP (peer groups)—maximum number of BGP peer groups.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	64
	Summit X450-G2	50
BGP (policy entries)—maximum number of BGP policy entries per route policy.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	256
	Summit X450-G2	204
BGP (policy statements)—maximum number of BGP policy statements per route policy.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	1,024
	Summit X450-G2	820
BGP multicast address-family routes—maximum number of multicast address-family routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	25,000
	Summit X450-G2	20,000
BGP (unicast address-family routes)—maximum number of unicast address-family routes.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690 (at default)	25,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
	Summit X450-G2	20,000
BGP (non-unique routes)—maximum number of non-unique BGP routes.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	25,000
	Summit X450-G2	20,000
BGP ECMP—maximum number of equal cost multipath for BGP and BGPv6.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	2, 4, 8, 16, 32, or 64
	Summit X450-G2	64

Table 5: Supported Limits for Core License (continued)

Metric	Product	Limit
BGPv6 (unicast address-family routes)—maximum number of unicast address family routes.	Summit X460-G2	6,000
	Summit X670-G2, X770	8,000
	ExtremeSwitching X870, X690	10,000
	ExtremeSwitching X870, X690 (with ALPM enabled)	100,000
	Summit X450-G2	4,800
BGPv6 (non-unique routes)—maximum number of non-unique BGP routes.	Summit X460-G2	18,000
	Summit X670-G2, X770, ExtremeSwitching X870, X690	24,000
	Summit X450-G2	14,000
GRE Tunnels—maximum number of GRE tunnels.	Summit X460-G2, X670-G2, X770, X450-G2, and ExtremeSwitching X870, X690	255
	ExtremeSwitching X620, X440G2	N/A
IS-IS adjacencies—maximum number of supported IS-IS adjacencies.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	128
	Summit X450-G2	N/A
IS-IS ECMP—maximum number of equal cost multipath for IS-IS.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	2, 4, or 8
	Summit X450-G2	N/A
IS-IS interfaces—maximum number of interfaces that can support IS-IS.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	255
	Summit X450-G2	N/A
IS-IS routers in an area—recommended maximum number of IS-IS routers in an area.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	256
	Summit X450-G2	N/A
IS-IS route origination—recommended maximum number of routes that can be originated by an IS-IS node.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	20,000
	Summit X450-G2	N/A
IS-IS IPv4 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	25,000
	Summit X450-G2	N/A
IS-IS IPv4 L2 routes—recommended maximum number of IS-IS Level 2 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	25,000
	Summit X450-G2	N/A
IS-IS IPv4 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	20,000
	Summit X450-G2	N/A

Table 5: Supported Limits for Core License (continued)

Metric	Product	Limit
IS-IS IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 Summit X450-G2	10,000 N/A
IS-IS IPv6 L2 routes—recommended maximum number of IS-IS Level 2 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 Summit X450-G2	10,000 N/A
IS-IS IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a L1/l2 router.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 Summit X450-G2	10,000 N/A
IS-IS IPv4/IPv6 L1 routes in an L1 router—recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 Summit X450-G2	20,000 N/A
IS-IS IPv4/IPv6 L2 routes in an L2 router—recommended maximum number of IS-IS Level 2 routes in a Level 2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 Summit X450-G2	20,000 N/A
IS-IS IPv4/IPv6 L1 routes in an L1/L2 router—recommended maximum number of IS-IS Level 1 routes in a Level 1/Level2 IS-IS router. The numbers documented are based on 50% IPv4 routes and 50% IPv6 routes.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690 Summit X450-G2	20,000 N/A
MSDP active peers—maximum number of active MSDP peers.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690 Summit X450-G2	64 16
MSDP SA cache entries—maximum number of entries in SA cache.	Summit X670-G2, X770, ExtremeSwitching X690 Summit X460-G2 ExtremeSwitching X870 Summit X450-G2	14,000 10,000 11,000 8,000
MSDP maximum mesh groups—maximum number of MSDP mesh groups.	Summit X450-G2, X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	16
OSPFv2/v3 ECMP—maximum number of equal cost multipath OSPFv2 and OSPFv3.	Summit X460-G2, X670-G2, X770, X450-G2, ExtremeSwitching X870, X690	64

Table 5: Supported Limits for Core License (continued)

Metric	Product	Limit
OSPFv2 areas—as an ABR, how many OSPF areas are supported within the same switch.	Summit X450-G2, X460-G2, X670-G2, X770, ExtremeSwitching X870, X690	8
OSPFv2 external routes—recommended maximum number of external routes contained in an OSPF LSDB.	ExtremeSwitching X870, X690 Summit X770, X670-G2, X460-G2 Summit X450-G2	10,000 5,000 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 Summit X670-G2, X460-G2, X770 Summit X450-G2	4,000 2,000 1,600
OSPFv2 interfaces—recommended maximum number of OSPF interfaces on a switch (active interfaces only).	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690 Summit X450-G2	400 320
OSPFv2 links—maximum number of links in the router LSA.	Summit X460-G2, X670-G2, ExtremeSwitching X870, X690 Summit X770 Summit X450-G2	400 419 320
OSPFv2 neighbors—maximum number of supported OSPF adjacencies.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690 Summit X450-G2	128 96
OSPFv2 routers in a single area—recommended maximum number of routers in a single OSPF area.	ExtremeSwitching X870, X690 Summit X770, X670-G2, X460-G2 Summit X450-G2	100 50 40
OSPFv2 virtual links—maximum number of supported OSPF virtual links.	Summit X460-G2, X670-G2, X770, ExtremeSwitching X870, X690 Summit X450-G2	32 25
OSPFv3 areas—as an ABR, the maximum number of supported OSPFv3 areas.	ExtremeSwitching X870, X690 Summit X460-G2, X670-G2, X770 Summit X450-G2	100 16 12
OSPFv3 external routes—recommended maximum number of external routes.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690 Summit X450-G2	10,000 7,500
OSPFv3 inter- or intra-area routes—recommended maximum number of inter- or intra-area routes.	ExtremeSwitching X870, X690 Summit X770, X670-G2, X460-G2 Summit X450-G2	4.000 3,000 500

Table 5: Supported Limits for Core License (continued)

Metric	Product	Limit
OSPFv3 interfaces—maximum number of OSPFv3 interfaces.	Summit X770	128
	Summit X670-G2, X460-G2, ExtremeSwitching X870, X690	256
	Summit X450-G2	192
OSPFv3 neighbors—maximum number of OSPFv3 neighbors.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	64
	Summit X450-G2	48
OSPFv3 virtual links—maximum number of OSPFv3 virtual links supported.	Summit X770, X670-G2, X460-G2, ExtremeSwitching X870, X690	16
	Summit X450-G2	12
PIM IPv4 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	512
PIM IPv4 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	180
PIM IPv4 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	3,000 (depends on policy file limits)
PIM IPv4 Limits—maximum number of multicast sources per group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	5,000
PIM IPv4 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	145
PIM IPv4 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	32
PIM IPv6 (maximum interfaces)—maximum number of PIM active interfaces.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	512
PIM IPv6 Limits—maximum number of multicast sources per group.	Summit X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	2,500
	Summit X450-G2,	2,000
PIM IPv6 Limits—maximum number of multicast groups per dynamic rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	70
PIM IPv6 Limits—maximum number of multicast groups per static rendezvous point.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	3,000 (depends on policy file limits)
PIM IPv6 Limits—maximum number of dynamic rendezvous points per multicast group.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	64

Table 5: Supported Limits for Core License (continued)

Metric	Product	Limit
PIM IPv6 Limits—maximum number of secondary address per interface.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	70
PIM IPv6 Limits—static rendezvous points.	Summit X450-G2, X460-G2, X670-G2, X770, and ExtremeSwitching X870, X690	32

[a] The table shows the total available.
[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 would be appropriately lessened.
[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".

3 Open Issues, Known Behaviors, and Resolved Issues

Open Issues
Known Behaviors
Resolved Issues in ExtremeXOS 22.3

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 22.3.

Table 6: Open Issues, Platform-Specific, and Feature Change Requests (CRs)

CR Number	Description
ExtremeSwitching X690	
xos0067489	Link flaps occur when optics is removed, and then re-inserted, and after reboots.
xos0067675, xos0068380	EEE does not work on ExtremeSwitching X690-48t switches.
xos0068917	On ExtremeSwitching X690-48x switches, port 8 with 1G optics does not link up with autonegotiation turned on.
xos0067933	On ExtremeSwitching X690 series switches, the following behavior occurs when setting autonegotiation: • If you enable autonegotiation on a single port without specifying the advertised speed, the port is set to only advertise at 40Gb. • If you enable autonegotiation on multiple ports without specifying the advertised speed, the second port listed is only set to advertise at 40Gb, so the ports come up at 40Gb. • If you enable autonegotiation and specify the port speed, the port advertises both 40Gb and 100Gb.
xos0067380	On the ExtremeSwitching X690 series switches, when a VPLS service VMAN-tagged access port is configured with any tagged VLAN, packets with a VLAN tag that equals the VMAN tag are incorrectly transmitted over the VMAN VPLS instance.
xos0068904	On ExtremeSwitching X690-48t-2q-4c switches, ports 1–48 do not link at 100 Mbps when auto-negotiation is enabled.
xos0068971	On ExtremeSwitching X690 series switches, port 72 configured for 25G does not link up with autonegotiation turned on. **Workaround:** Disable autonegotiation on port 72 if configuring for 25G, which is the default setting.
ExtremeSwitching X440-G2	

Table 6: Open Issues, Platform-Specific, and Feature Change Requests (CRs) (continued)

CR Number	Description
xos0067772	Link flap occurs when 1m and 3m SFP+ DAC cables are inserted in ports 49–52 of ExtremeSwitching X440G2-48p-10G4 switches. This problem also occurs when ports are disabled, and then enabled.
xos0062773	After switch boot up or restart of process dot1ag, 95% CPU utilization occurs with 32 UP MEPs (maximum value).
Summit X460-G2 Series Switches	
xos0067840	OSFPv3 routes are not redistributed into BGP after a second or third failover with BGP peer-group configuration. **Workaround:** Reboot entire stack to redistribute the routes.
xos0067622	On Summit X460G2-24t-24ht switches, counter for undersized packets (less than 64 byte) does not increment as shown in the output of the command `show ports port rxerror`; however, the counter does increment when oversized packets (greater than 1518 bytes) are sent to the switch.
xos0066212	VRRP flap occurs during state transition when a single VRRP group contains 2,000 IPv6 instances.
Summit X770 Series Switches	
xos0068355	When scaling to 131,000 VLAN/port combinations, rebooting Summit X770 series switches produces the following error message: `<Crit:vlan.err.criticalInfo> Critical Info: Forcing vlan mgr to READY - Timer expired - 1 appls did not send load cfg ack.s`
xos0054125	On Summit X770 series switches, VRRP traffic convergence time is greater (10 seconds) after rebooting the VRRP master compared to Summit X460 and X670 (3 seconds) series switches. The switch has VRRP and OSPF for forwarding traffic to uplink.
xos0069068	On Summit X770 and X670-G2 series switches with more than 32 IPv4 ARPs, IP unicast traffic destined to IPv4 addresses residing on port number 64 or higher may not be forwarded. **Workaround:** Either use port numbers 1–63, or execute `configure forwarding internal-tables more l2`, and then save and reboot.
ExtremeSwitching X870 Series Switches	
xos0065687	ExtremeXOS allows configuration of slot type to models that cannot be stacked with the ExtremeSwitching X870 series switches.
Summit X450-G2	
xos0066473	FDB manager is not responding to Configuration manager in presence of a loop in the network.
ExtremeSwitching X620 Series Switches	
xos0068344	On ExtremeSwitching X620 series switches, fiber combo ports do not come up when the preferred medium copper link is down. **Workaround:** If the preferred medium is fiber, fiber combo port comes up when copper link is down.

Table 6: Open Issues, Platform-Specific, and Feature Change Requests (CRs) (continued)

CR Number	Description
SummitStack	
xos0067789	On Summit X460-G2 homogeneous stacks with greater than five BGP peer groups, some IPv6 neighbors are not established after a save and reboot of the stack.
xos0068388	Unable to query objects in the extremeStackMemberTable and extremeStackingPortTable.

xos0068431	On a stack with port partitioning, after rebooting standby node, the following spurious error messages occasionally appear:
	`<Erro:HAL.VXLAN.InitSlotFail> Slot-1: Fail to initialize slot 5: Set VXLAN default tunnel enable to 0 failed: Conduit failure`
	`<Erro:HAL.VXLAN.InitSlotFail> Slot-1: Fail to initialize slot 5: Set VXLAN termination to 1 failed: Conduit failure`
	`<Erro:HAL.VXLAN.InitSlotFail> Slot-1: Fail to initialize slot 5: Set VXLAN tunnel based VNID to 0 failed: Conduit failure`
	`<Erro:HAL.VXLAN.InitSlotFail> Slot-1: Fail to initialize slot 5: Set VXLAN default tunnel enable to 0 failed: Conduit failure`
	`<Erro:HAL.Port.Error> Slot-1: Failed to configure static mac move behavior on port 5:51.`
	The operation of the stack/switches is not affected.

xos0068597	If you partition the ports on a Summit X770 stack, save the configuration, and then reboot, occasionally the following spurious error messages appear while the switch is shutting down:
	`<Erro:HAL.Card.Error> Slot-2: ledLinkscanSummitV3: failed to resolve LED port for unit 0 port 2, rv=-34`
	`<Erro:HAL.Card.Error> Slot-2: ledLinkscanSummitV3: failed to resolve LED port for unit 0 port 3, rv=-34`
	The operation of the stack/switches is not affected.

xos0068396	After removing a fan, fan status appears as "Operational at 0 RPM". If switch is then rebooted, the status changes to "Failed at 0 RPM".
xos0068592, xos0067767	In ExtremeSwitching X690 stacks, receive packet counter is incrementing at two to three times over the correct rate causing incorrect statistics information to appear for MPLS and VXLAN.
xos0058419	After rebooting a stack, error messages similar to the following appear for ports belonging to LAGs: `<Erro:cm.sys.actionErr> Slot-2: Error while loading "ports": Speed change is not allowed on port 2:6 as it is a trunk member port.`
xos0060893	On SummitStacks, master and backup nodes display PSU detail incorrectly of each other as 200W, instead of the actual value.
General	
xos0067478	Ethernet OAM link fault management is only supported on non-combo fiber ports. Only 1G and 10G are supported. However, 40 and 100G ports are allowing OAM to be configured on them.
xos0056433	In a stack with Summit X770 series switches as the master and backup with broadcast traffic running from master/backup to standby slots, standby slots may go to failed state when a stack failover occurs.
xos0060490	The SMON MIB (RFC 2613) which was used to configure mirroring using SNMP is not available in ExtremeXOS.

Table 6: Open Issues, Platform-Specific, and Feature Change Requests (CRs) (continued)

CR Number	Description
xos0066067	When a configuration file (.xsf) saved in ExtremeXOS 21.1 is run on ExtremeXOS 22.1, all the configured MAC lists, primary and secondary shared-secrets in RADIUS and TACAS, and NMS shared-secrets are replaced with empty strings.
xos0067659	After clearing license info, enabling Direct Attach Feature Pack, and then enabling Core license, crash occurs. **Workaround:** Reboot after clearing license info, and apply Core license before applying Direct Attach Feature Pack.
xos0068902	On ExtremeSwitching X440-G2, X620, Summit X46-0G2 series switches, and SummitStack,`configure port preferred medium copper` on a disabled combo port makes its peer end active.
xos0069087	Operational diagnostics sometimes do not run on some ExtremeSwitching X870 and X690 series switches. When the switch is rebooted to run operational diagnostics, the diagnostics do not run due to a timeout of the hardware watchdog timer, and the switch reboots and starts ExtremeXOS instead. **Workaround:** • After switch has rebooted due to watchdog expiration, before ExtremeXOS starts, manually select diagnostics image from the current partition (primary or secondary). • Power on the switch, and before ExtremeXOS starts, manually select diagnostics image from the current partition (primary or secondary).
BFD	
xos0058364	BFD and ELSM sessions go down momentarily while installing image or executing `show tech`.
BGP	
xos0067703	In VPN-VRF, some ECMP routes are missing in route table. Issue does not occur in default or user VR.
xos0067519	BGP graceful restart is not supported on the MBGP/VXLAN feature.
xos0067757	After disabling BGP, and then executing `disable bgp neighbor all`, switch becomes unresponsive.
Clocking	
xos0068341	In ExtremeXOS 22.2 and 22.3, only 12 slave clocks may be configured when configuring 10 PTP master clocks. Previous releases allowed 40 slave clocks.
DHCP/BOOTP	
xos0054230	CLI counters are not available for DHCPv6 relay agent remote ID option feature.
Identity Management	
xos0066783	Using IDMgr, UPM, and Policy combination makes client not reachable untill IDMgr settles down.
MLAG	

Table 6: Open Issues, Platform-Specific, and Feature Change Requests (CRs) (continued)

CR Number	Description
xos0063247	Duplicate packets occur during MLAG link recovery when LACP is used for load sharing.
MPLS	
xos0059159	An error message (EMS) is required when H-VPLS is down due to no pseudowire status support.
xos0061374	With an L2VPN session between two Label Edge Routers (LERs), broadcast packets egressing the LERs are corrupted.
xos0066778	With a LAG port configured on a VPLS service VLAN/VMAN, changing the tag of the service VLAN/VMAN results in traffic loss.
xos0067616	Kernel Ref count messages occur when changing pseudowire path in VPLS.
Optics	
xos0068874	On ExtremeSwitching X620 series switches, when using optic "SPG-DR-LX-IDFC-EX" from Source Photonics, if auto-negotiation is turned "on" there is a traffic issue.
xos0067870	Removing or inserting optics, system initialization, or peer rebooting, will possibly result in extra link events being logged.
xos0068910	On ExtremeSwitching X620 and X440-G2 series switches, when using optic "RSPX0SER-ST5" from OE SOLUTIONS, link flap occurs while rebooting and removing/inserting optic.
OSPF	
xos0067974	With IGMP snooping disabled, IP DAD on, and IPv6 addresses configured on VLANs, after deleting, and then adding back ports, OSPF is not established. **Workaround:** Do any of the following: • Enable IGMP snooping on the VLANs. • Turn off IP DAD. • Do not use IPv6 addresses on the VLANs.
OVSDB	
xos0064656	port_fault_status should be set in the hardware_vtep schema. In ExtremeXOS 22.1 for port_fault_status (PSTAG-like scenarios), EMS receives a log message.
xos0064657	port_fault_status should be set in the hardware_vtep schema. In ExtremeXOS 22.1 for port_fault_status (PSTAG-like scenarios), EMS receives a log message.
xos0065008	OVSDB schema is not cleared when changing configuration and rebooting. **Workaround:** In setups where OVSDB is used to manage and configure the ExtremeXOS switch as a VTEP, the VTEP schema database must be manually cleared when the active configuration of an ExtremeXOS switch is changed using the CLI command `use configuration`. Failure to do so might result in OVSDB using a stale VTEP schema database.

Table 6: Open Issues, Platform-Specific, and Feature Change Requests (CRs) (continued)

CR Number	Description
xos0065504	The command `show ovsdb schema` can become unresponsive when either ExtremeXOS or OVSDB are synchronizing data.
Policy	
xos0067946	Authentication override does not work after failing over from master on a stack, and then restarting process netlogin. **Workaround:** Disable, and then re-enable policy.
Security	
xos0067219	With certificate signing request (CSR), even when private key and certificate match, HTTP access is not granted.
SNMP	
xos0062882	Whole MIB compilation gets stuck at EXTREME-V2-TRAP MIB.
xos0068767	Trap receiver configuration is not saved in ExtremeXOS when configured from Extreme Management Center.
SSH	
xos0063343	Using SFTP to transfer a file with a name that is greater than 92 characters causes a Signal 6 crash.
VXLAN	
xos0067755	When transit node is VTEP, metering does not work as expected.
xos0066776	On SummitStacks, L2 broadcast traffic sent to 2,048 remote VTEPs is dropped after failover.

Known Behaviors

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

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

CR Number	Description
General	
xos0067980	SSH idle timeout timer is ignored if SSH rekey timer is enabled.
xos0069068	On Summit X770 and X670-G2 series switches with more than 32 IPv4 ARPs, IP unicast traffic destined to IPv4 addresses residing on port number 64 or higher may not be forwarded. **Workaround:** Either use port numbers 1–63, or execute `configure forwarding internal-tables more l2`, and then save and reboot.
Summit X770 Series Switches	
xos0068553	The ARP learning rate on the Summit X770 series switches has decreased starting with ExtremeXOS 22.2 due to code infrastructure changes.

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

CR Number	Description
ExtremeSwitching X690 Series Switches	
xos0067697	On ExtremeSwitching X690 series switches, Tri-speed (10/100/1000 BaseT) BASET optic is not supported.
xos0068281	On ExtremeSwitching X690-48t copper ports, EAPS convergence time is greater than 100 milliseconds.
SummitStack	
xos0066970	In the output of the `show fan` command, the fan tray revision and part number appears only for first fan tray in stack.

Resolved Issues in ExtremeXOS 22.3

The following issues were resolved in ExtremeXOS 22.3. ExtremeXOS 22.3 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, and ExtremeXOS 22.2. For information about those fixes, see the release notes for the specific release.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3

CR Number	Description
Summit X440-G2 Series Switches	
xos0063038	If a policy profile has tci-overwrite enabled and a rule in that profile has a CoS index set with an index that has a meter with a set-drop-precedence set to dot1p, the following message may appear: `<Erro:HAL.IPv4ACL.Error> ACL filter install failed on vlan *, port *, rule "policy.rule.cos.1.20.8" index –18, Invalid configuration`
xos0066461	Adding VLANs to a port untagged using an SNMP set shows as untagged in the `show configuration vlan` command.
xos0066945	On Summit X440-G2 series switches, 10G ports are not coming up with 5-meter passive copper cable when connected to ExtremeSwitching X620-16X.
xos0067493	PTPv1 packets are dropped on the port if GPTP is enabled on the same port.
xos0068466	"Fan Failures RPM out of Range" messages appear on ExtremeSwitching X440-G2 series switches.
Summit X450-G2 Series Switches	
xos0060461	Need command option for iBGP and eBGP protocols under the `configure iproute ipv6 priority` command.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
Summit X460-G2 Series Switches	
xos0057796	Power is momentarily denied to PoE devices connected on ports when a redundant PSU is inserted.
xos0064795	With a 4-node ERPS subring topology with no virtual channel, after link failure between two interconnect nodes, ring re-convergence, and then link restoration, traffic loss occurs for over 5 minutes.
xos0066140	RSTP BPDU is not transmitted even though STP state is in forwarding mode when loop-protect is enabled.
xos0067064	On Summit X460-G2-16mp-32p-10GE4 switches, SyncE does not work on the multi-speed supported ports (1–16).
xos0067077	In Summit X460-G2 alternate stacks, 10G links from the VIM-2T module of the backup slot go down after saving, and then rebooting.
ExtremeSwitching X620 Series Switches	
xos0065920	Link status goes to Ready state on port with 10/100/1000BASE-T optics after multiple reboots.
Summit X670-G2 Series Switches	
xos0065571	Ping fails over L3VPN tunnel when the corresponding ARPs are in Layer 3 hardware hash table as "Extended View". Affects Summit X450-G2, X670-G2, and X770 platforms.
xos0065724	Traceroute fails when the intermediate router is a VRRP gateway.
xos0066844	Port with copper SFP inserted appears as active even if it is administratively disabled.
xos0068353	For Summit X670-G2 series switches acting as a VRRP master, SSH session is not established for some prefixes after upgrading to ExtremeXOS 22.2.
Summit X770 Series Switches	
xos0053091	On Summit X770 series switches, additional link flaps occur on 40G ports after reboot.
xos0064590	Port partitioning configuration is lost after a reboot if there is no physical cable attached to the partitioned port.
xos0066761	On Summit X770 series switches, CPU utilization of hal process is always high.
xos0066963	Jumbo frame is disabled on master port after rebooting when ports are partitioned.
xos0066338	On Summit X770 series switches and stacks, after configuring ports with partition 4x10G, saving and then rebooting produces the following error: `Error: Failed to connect CLI for 91 seconds!`.
xos0067667	On Summit X770 series switches, time drifts late over the period even after syncing with SNTP server.
SummitStack	

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0058499	In SummitStack, the snmpEngine values are maintained in each node separately instead of a single value, which is causing different values on each failover.
xos0065970	In SummitStacks, unable to start process for python module; process name is not recognized: `Error: Unknown process name EPM_Other2`
xos0066104	In SummitStacks, memory leak occurs in backup slot when configuring LLDP to advertise power-via-mdi with classification.
xos0066331	Layer 3 traffic is not forwarded after multiple stack failovers.
xos0066423	In SummitStacks, with policy re-authentication and continuous MAC move scenarios, ACL delete requests are failing in backup node.
xos0066812	On SummitStacks of X670G2 or X770 series switches, L2VPN is not supported.
xos0060485	MPLS process ends unexpectedly with signal 11 when changing the LSR ID.
xos0065387	SNMP times out while when saving on an eight-node stack of Summit X440 series switches.
xos0065756	In SummitStacks, alternate IP address is used for external communication even though a Management IP address is configured.
xos0066085	Restart of some processes does not work properly when the standby slot has a lower license level.
xos0067096	Multicast traffic is dropped on front panel port 1:1 when management port goes down on stacking switch.
xos0067253	IPv4 packets ingressing a non-master stack node can be dropped when the port number of the destination's ARP entry is unknown, such as when the destination is using Network Load Balancing (NLB).
xos0060343	On Summit X670v stack, configuration file replication on standby nodes times out after second or third failover.
xos0067425	Processes tBcmxSync or HAL may end unexpectedly during client authentication when policy and diffserv configurations are sent at least twice from Extreme Management Center NAC manager, or the diffserv replacement configuration is modified manually on the switch.
ExtremeSwitching X870 Series Switches	
xos0066044	Auto-negotiation at 25G and 50G speeds is not supported on ExtremeSwitching X870 100G ports. Auto-negotiation is disabled by default for 25G and 50G ports.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description

xos0066307	On ExtremeSwitching X870 series switches, IP security features may not work in conjunction with ONEPolicy.
	 Messages similar to the following while enabling either feature may appear:
	 `Warn:ACL.Policy.IntAppConfFail&gt Failed to install dynamic acl esDhcpSnoop_deny_1 for internal applicaton IpSecurity on vlan client port 23. Error: ACL install operation failed - filter hardware full for vlan client, port 23.`
	 `Erro:Policy.CfgHwRsrcFail&gt Slot-1: Failed to reserve hardware rules of type unknown.`

xos0066764	Traffic is forwarded without CVID tag on untagged VMAN ports after adding VMAN to VXLAN.
xos0066998	On ExtremeSwitching X870 series switches, not all policy rules are able to be written depending on the order that they are applied.
xos0067183	On ExtremeSwitching X870 series switches, kernel crash occurs randomly booting up switch with virtual router and mirroring configuration.
xos0068223	On ExtremeSwitching X870 series switches, very infrequently when running extended diagnostics, "Test loopback phy fiber - FAIL"and "Test snake interface - soc_phyctrl_loopback_set: u=0 p=5 TIMEOUT" errors occur.
General	
xos0061317	Switch reboots unexpectedly when enabling FIP snooping.
xos0063551	SNMP polling on CFM segment frame-delay statistics returns incorrect values.

xos0063669	Erro:RtMgr.Client.ReplyTimeOut messages appear after run failover/ reboot:
	 `<Warn:EPM.hello_rate> Slot-2: Received hellos from process rtmgr 2 more often then expected 3`
	 `<Erro:RtMgr.Client.ReplyTimeOut> Slot-2: Client with ID=0x00000012 Timed out waiting for (ADDUPDRTE).`
	 `<Erro:RtMgr.Client.ReplyTimeOut> Slot-2: Client with ID=0x00000012 Timed out waiting for (RTEGET).`

xos0064138	Client identifier option length in DHCPv6 solicit packet is 16 instead of 14 with Link layer address padded with zeroes.
xos0064633	Lacking support for Entity Sensor MIB, as well as Entity Sensor MIB Extensions. These MIBs are needed to present digital diagnostics information for the transceivers.
xos0064680	STP port-specific configuration is lost after disabling load sharing or moving the port to a different VLAN.
xos0064727	On DHCPv6 clients, sometimes the IPv6 address is not removed even after disabling the client, and after rebooting, the IPv6 address is saved and this causes the client to go into a stopped state with the following error message appearing: <Erro:vlan.AddIPAddrFail> Failed to add IP addr 8001::4aa6:dd38:9b32:e7b/128 from DHCPv6 to VLAN client, DHCPv6 configured IPv6 address already exist on interface client

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0064870	Slots fail sometimes when applying PVLAN and STP configuration.
xos0064975	Ejecting a memory card using the `eject memorycard` command changes the switch configuration so that it does not save core dump files to memory or a removable storage device.
xos0064983	Optics information does not appear properly for Enterasys SFP +10GBASE-ER.
xos0065210	With account lockout feature configured, an appropriate log message is not generated when users are locked out after three unsuccessful login attempts.
xos0065321	With SSH session, source address information is not sent to TACACs accounting server.
xos0065400	VLAN name and tag do not appear correctly when VLAN is created with VLAN name as "tag".
xos0065654	Etmon process ends unexpectedly with signal 10 when packet size in sampled packet is a negative integer.
xos0065764	Link status goes to ready state on ports with 10/100/1000BASE-T optics after multiple reboots.
xos0065946	SNMP get for lldpRemSysCapSupported MIB returns incorrect value.
xos0065977	Random Nettools process ends unexpectedly with Signal 5 when router discovery and DNS is enabled.
xos0066029	In Summit X460-G2 stacks, LACP keeps flapping due to forwarding one LACP PDU to another group.
xos0066030	L2PT is not working properly after path switchover in VPWS.
xos0066059	CLI cursor jumping when word wrapping when using SSH session.
xos0066072	The command `configure ports rate-limit flood out-actions disable-port` does not take effect until the command `clear meter out-of-profile` is executed.
xos0066156	Switch reboots unexpectedly due to memory leak in dot1ag process.
xos0066170	Kernel crash occurs sometimes when ip-arp fast convergence is enabled.
xos0066345	XMLC process ends unexpectedly with signal 6 when sending XML notification to Ridgeline server.
xos0066386	The `show configuration` command stops responding and produces an error when there is a loop in the network.
xos0066462	Copying a file to the cfg directory causes the switch to stop responding.
xos0066472	Executing `debug hal show compact-flash` command returns kernel mismatch error.
xos0066477	Creating a VLAN starting with "vr" causes syntax recognition problems with the `show iparp vr` command.
xos0066483	The encrypted shared secret for TACAS accounting secondary servers does not appear in the configuration.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0066610	Error "Cannot open Python script" appears after executing a Python script stored under a user-created subdirectory.
xos0066838	When configuring a "legacy" RADIUS-Accounting server with a DNS-resolved hostname, the hostname is lost after a reboot (or similar circumstances, such as multiple failovers).
xos0066839	When debug packet capture is enabled for a port, pcap file is not created in internal-memory.
xos0066932	Actual/configured sFlow sample rates are different after reconfiguring.
xos0066984	RADIUS-accounting request packet shows incorrect account-terminate reason for user logout from SSH session.
xos0067138	BFD is not working for IP static multicast route.
xos0067158	You cannot synchronize a master switch running a version earlier than ExtremeXOS 22.2 to a target node running ExtremeXOS 22.2 or later. The command fails and the following error message appears: `Error: the target slot's partitions are not compatible with the Master's for synchronize.`
xos0067206	Unable to login to Chalet with any account that uses an ampersand (&) character.
xos0067739	UDP configuration is lost after reboot with IP DAD enabled.
xos0067820	ExtremeXOS refuses connections with usernames starting with letters h, i ,j, k, p, q, r, and s using SOAP/XML.
xos0067877	NTP restrict-list is failed when adding ipadress without vr keyword.
xos0068424	EDP process ends unexpectedly when a CDP packet without version details in software version TLV is received.
xos0068531	System CPU utilization is not accounting for CPU utilization for some Kernel threads in the output of the command `show cpu-monitoring`.
xos0064624	On ExtremeSwitching X620 series switches, when using optic SPG-DR-LX-CDFC-EX from Source Photonics, there is a traffic issue.
xos0068752	Kernel crash occurs when processing a packet with an invalid IP header length.
xos0068750	AAA process ends unexpectedly with signal 11 when processing a corrupted RADIUS-challenge packet.
xos0067161	LACP flap occurs when disabling the mirror on port where LAG is configured with LACP.
xos0067492	Documentation should indicated that ExtremeXOS does not notify you when configuration settings for a stack are inappropriate for a node in the stack.
xos0067546	EPM process ends unexpectedly when SSH process is restarted while SNMP query on memory statistics is still in progress.
xos0067841	Packets are dropped at ingress port for traffic at a rate greater than 1,000 pps when 500 ACLs are installed.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
ACL	
xos0054222	Unable to add second IPv6 address prefix to the network-zone after adding IPv4 address.
xos0065930	ACLCBFUNC log occurs after associating a policy that has CLEAR-flow and network-zone configuration.
xos0067912	The command `show port protocol filter` displays the "Error: Configuration reply is too big" in output.
BGP	
xos0052432	Need provision for advertising/receiving unique local IPv6 unicast address (ULA) using BGP protocol.
xos0052786	BGP aggregation command demands global unicast addresses (GUA) and does not work with IPv6 unicast addresses.
xos0063959	BGP routes become unfeasible when default routes are advertised through OSPF or BGP.
xos0065742	SNMP traps are not generated for BGP state change events.
xos0066775	Configured peer group capabilities and policies are not reflected after creating a new BGP neighbor.
Clocking	
xos0064859	In SummitStack, gPTP process ends unexpectedly during bootup if AVB license was enabled on any of the stack nodes.
EAPS	
xos0067203	Multicast packets are flooded on EAPS-blocked ports after removing and then adding ports configured with PSTAG.
ELRP	
xos0064923	When a remote loop is detected by ELRP (ingress and egress port of loop detection is the same) an excessive number of log messages occur.
xos0065788	After deleting a port, disabled by ELRP, from a VLAN, the port remains disabled.
xos0066895	ELRP process ends unexpectedly when a loop is detected in the switch.
ERPS	
xos0065805	Constant flush happens in ERPS non-revertive mode when the port being blocked is non-RPL.
xos0066367	Need to have a "clear" command to change ERPS ring state from "pending" to "idle" state.
xos0066489	Loop occurs in ERPSv2 setup after rebooting one of the interconnecting nodes.
xos0066490	ERPS in non-RPL nodes remains in pending state after rebooting interconnection node.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0067325	After recovering from multiple link failures, ERPS incorrectly keeps both the ring links in blocked state.
ESRP	
xos0066996	ESRP does not update the neighbor state properly while becoming master from neutral state.
FDB	
xos0066885	FDB is not removed in software after ageing period.
xos0067271	FDB mismatch occurs between software and hardware after deleting, and then adding, ISC port multiple times.
IP General	
xos0050804	IPv6/PIMv6: The FHR does not respond with neighbor advertisements when it is also sending PIM register packets; the RP is sending neighbor solicitations. (The FHR found within a multi-access network temporarily floods the RP with register packets even if Register Stop messages are received when traffic is started.)
xos0061488	Decompressed routes are not programmed into hardware after disabling IPv4 compression.
xos0061489	Compressed routes are not programmed into hardware when master route fails.
xos0065615	Local multicast traffic is not egressing using a newly added member port in a LAG.
xos0066006	When ICMP redirect is received and the new gateway ARP is not resolved, the redirect route becomes valid and is used. This results in traffic being dropped. This problem is more apparent when the redirection happens to a host on a different subnet because ExtremeXOS enables IP ARP checking by default.
xos0066444	Kernel error "Unable to copy IPMC index" appears in MLAG peers with PIM dense mode.
xos0066590	In an MLAG peer when its MLAG port is down, the following error appears: "Group <ip> not found for VLAN".
xos0066772	Local multicast fast-path forwarding does not work for a few ports when IGMP filter is in per-VLAN mode.
xos0066806	PIM checkpointing loop occurs between two switches that have two ISCs over two VRs.
xos0066921	ARP fails to resolve for some hosts.
xos0066950	Hash collision error messages may appear when there is contention for the L3 Hash table: `<Warn:Kern.IPv4Adj.Warning> vrId 0 adj 0x00000002 Error finding adjacency when deleting hash collision.`
xos0067063	Rtlookup is not able to display all the ECMP routes.
xos0068023	Hash collision warning message appears with invalid VRID when exceeding L3 hash table limit.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0068209	PIM process ends unexpectedly with signal 11.
MLAG	
xos0066323	When MLAG is configured with alternate path and ISC link goes down, a peer down log message is not generated.
xos0066325	When MLAG is configured with alternate path and primary path goes down, SNMP trap for ExtremeMlagPeerDown object is not generated.
xos0066923	Need commands to configure "reload-delay" timer for MLAG ports.
xos0066787	In ExtremeXOS User guide, need to add a recommendation regarding MLAG with LACP implementation.
MPLS	
xos0065372	MPLS error messages occur after disabling, and then enabling network VLANs.
xos0065987	Service port FDB entries are learned on physical port of Network VLAN in provider switch.
xos0066366	On VPLS network with LAG on access side, clearing FDB on LSRs and LERs results in traffic drop.
xos0066476	MPLS label TTL is not set properly for VPLS traffic in RSVP-TE.
xos0066782	BFD session ends when removing CVID from a service VMAN port.
xos0066813	Service VLAN ARP packets are lifted to the CPU during MPLS swap operation when service a VLAN is configured with the IP address of the provider switch.
xos0067084	FDB is not learned over pseudowire after disabling, and then enabling, learning on network VLAN ports.
xos0067323	FDBs are learned on incorrect VPLS peer on PE switches after include/exclude dot1q tag in P switch.
xos0067463	Traffic does not distribute across LSPs and LAG after enabling L2VPN sharing feature.
NetLogin	
xos0062680	Switch fails to send RADIUS accounting message for dot1x user after `clear netlogin state port <portNumber>` command.
xos0062758	With policy enabled, client authenticated using NetLogin is not getting aged out when reauthentication is configured.
xos0065648	When a MAC address moves from a NetLogin-enabled port (mac-vlan mode) to a non-NetLogin-enabled port, the VLAN_MAC table can become full resulting in the following message: `<Warn:HAL.FDB.MacVlanAddFail> MAC-based VLAN entry 78:7E:61:A1:DC:DC vlan 2600 addition to port 22 failed, Table full`

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0066224	User name is missing from output of `show log` command for NetLogin users when they are cleared by link down/restart process NetLogin event immediately after reboot.
xos0066231	With default NetLogin configuration, extremeNetloginuser login and logout traps are not sent.
xos0066538	With web-based NetLogin enabled, cannot access the device using URL "http://network-access.com/login".
xos0066626	NetLogin process ends unexpectedly with signal 11 when RADIUS accept packet contains MS-ipv4-remediation-servers attribute with an incorrect IP address.
xos0066770	Memory leak occurs in aaa process when NetLogin dot1x client times out or authentication fails for the client.
xos0066982	In NetLogin dot1x, RADIUS retries are not working properly.
xos0067106	In dot1x authorization, service unavailable vlan port is re-authenticated in every authorization causing blocked port.
xos0068215	Logout dialog box appears even after disabling Netlogin logout-privilege.
xos0068302	With both HTTP and HTTPS enabled, sending HTTP request from NetLogin client causes the switch to return with HTTP response instead of HTTPS.
xos0068454	In ISP mode, if no ports are associated with the NetLogin VLAN, then the client cannot access the base URL.
xos0068660	Session-timeout value from RADIUS server does not have higher precedence over value provided from CLI.
xos0068698	In NetLogin web, after you click the logout button, you are not redirected to a page with the message "You have logged out".
OSPF	
xos0051490	External LSA generated by an ASBR in NSSA area contains wrong forwarding address.
xos0065830	After port flaps, OSPF-learned routes are not present in kernel database.
xos0066804	Routes learned from OSPF are lost after multiple port flaps occur.
xos0066986	OSPF E1 routes in NSSA area are removed or not updated properly in the routing table.
Security	
xos0062037	DHCP snooping entry gets programmed without client port number.
xos0064588	Policy profile and policy rules may appear without a complete description of the fields.
xos0065354	Kernel error "packet number to save out of range: 49" occurs when DOS protect is enabled in the switch.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0065505	You are not notified that the configuration is not allowed when configuring policy mode authentication optional on NetLogin web-enabled ports.
xos0065552	RADIUS-accounting request packet shows incorrect reason for client termination.
xos0066135	If policy is removed from a port/VLAN that is in the Spanning Tree Blocking state, network loops may occur.
xos0066380	NetLogin sessions with policy enabled persist after a port/VLAN transitions into a blocking state.
xos0066398	CoA disconnects are incorrectly logged as idle timeouts in EMS.
xos0066446	A Change of Authentication request can inadvertently create a new session if a matching existing authentication for the request is not present.
xos0066611	ExtremeXOS implementation of RADIUS inappropriately requires Message-Authenticator attribute in CoA-Request and Disconnect-Requests.
xos0066634	Summit X460-G2 series switches policy rule limits are set too high.
xos0066662	RADIUS CoA re-authentication requests reauthenticate all agents (MAC/dot1x/web), rather than only active agents if an agent is not specified in the request.
xos0066874	Memory leak occurs in AAA process when dot1x clients are authenticated frequently.
xos0066877	In TACAS, NetLogin, and SNMPv3, encrypted form of configured password is changing after every save command.
xos0067076	NetLogin process ends unexpectedly while fetching the client details using SNMP MIB etsysMACAuthenticationMACSession and it happens only when there is MAC move observed for the clients.
xos0067079	ACL installation for the policy authenticated client is failing when diffserv replacement and meter configuration is present in the switch.
xos0067167	When switching the policy profile authentication override from disable to enable with a static rule configured, NetLogin session is not created even though the MAC address(es) are programmed in FDB.
xos0067179	Both MAC and CEP NetLogin sessions exist with authentication override enabled in certain configuration and traffic scenarios.
xos0067227	IDMgr entries are not flushed when ARP fast-convergence is on.
xos0067963	After configuring IP security, if the VLAN name is changed, the change is not reflected in the command `show configuration ipsecurity`.
xos0068356	Informational messages appear on the console when an NTP-enabled VLAN becomes inactive.
xos0068710	Additional Netlogin traps are sent when configured to send only max-reached trap.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0068722	Policy-enabled port is removed from VLAN when it is added as untagged using SNMP/ATG tool.
SNMP	
xos0062668	MIB compilation issues occur with VLAN MIB when using mgsoft.
xos0065943	SNMP walk for extremePortUtilizationTable returns integer value, but CLI output returns decimal value.
xos0066012	ExtremeXOS MIBs have non-compilable errors.
xos0066735	The etsysVlanAuthorizationMIB MIB definition is not incorporated into ExtremeXOS.
xos0068632	In ExtremeXOS User Guide for the EXTREME-PORT-MIB, the extremePortMauTable table shows incorrect information.
SSH	
xos0063806	After establishing SSH session with switch for some time, SSH login fails and the command `show management` becomes unresponsive.
xos0063856	After enabling SSH2, key generation time appears as approximately 15 minutes when it actually takes less than one minute.
xos0064864	Switch can go into reboot loop if the length of configured SSH private key is different from the actual key stored in EEPROM. This can happen when you attempt to configure an invalid key or when loading a .cfg file containing an SSH private key from another switch onto a new switch with default setting.
xos0065712	When repeated login and logout is performed using SSH-PKI (SSH login using certificates) for about two days from eight terminals, memory leak occurs.
xos0066027	After downloading certificates, the commands `show ssl trusted-ca` and `show ssl ocsp-signature-ca` fail to show any output. However, PKI validation that makes use of these certificates works.
xos0066758	SSH login fails in first attempt, but succeeds in the second attempt, during RADIUS authentication even if credentials are valid.
xos0066931	Exsshd process consumes ~90% CPU when the command `clear session` is executed for the open SSH sessions.
xos0067055	Log message "Process exsshd sends hello too often" appears when SSH is enabled in the switch.
xos0067182	Authentication on switch using RSA keys stops working if one of the user keys is deleted.
xos0067704	The process exsh ends unexpectedly after issuing command with include option that uses # via SSH script.
xos0067887	Switch reboots unexpectedly when there are continuous SSH attempts and those attempts are rejected with access-profile.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
xos0068556	SSH with command argument as "show commands" is not working with user account.
STP	
xos0064798	Configured port's STP properties are lost when the port is moved from one VLAN to another.
xos0066559	In ExtemeXOS User Guide, need to add a recommendation regarding STP with L2-fast-convergence.
xos0066837	When the switch is rebooted, the edge port gets blocked even though the STP domain is disabled.
xos0066919	When loop protect occurs on the switch, need to log an event message and send a trap
xos0067108	Packets received on STP-blocked ports get forwarded to other STP ports when NetLogin and ONEPolicy are enabled with authentication mode optional.
xos0067194	Topology change notification is not generated for the STP domain dot1d mode when there is change in the topology.
xos0067560	Globaly disabling STP takes longer to converge when loop protection is enabled.
xos0068283	ExtremeXOS is transmitting BPDUs with the agree bit in the flags field persistently clear.
xos0068415	STP backup root feature is not activated after disabling STP on master root.
VLAN	
xos0066557	Kernel crash occurs after removing a subVLAN from one VR and adding the same subVLAN in another VR.
xos0066891	Packets are being forwarded without a tag after rebooting when PSTAG configured. This issue occurs when VLANs are configured with VID as "1".
xos0066926	Errors occur when configuring OpenFlow in passive mode.
xos0067048	Multicast traffic is not forwarded on PStag ports when port is also added as part of another non-PStag VLAN.
xos0067243	When adding untagged ports to a VLAN using Q-BRIDGE MIB, ports are added in the MAC-BASED VLAN.
xos0067244	Able to add same port as tagged and untagged in a VLAN using Extreme Management Center console.
VRRP	
xos0061817	VRRP fabric routing is not supported for VRRP owner address (configuring at priority 255).
VXLAN	
xos0066883	Process HAL ends unexpectedly with signal 11 on restarting all ports with basic VXLAN configuration.

Table 8: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs) in 22.3 (continued)

CR Number	Description
XML	
xos0067822	Memory leak occurs in XMLD process whenever Chalet session refresh happens.
XNV	
xos0061611	FDB entry from base VLAN is not removed after restarting XNV dynamic VLAN-enabled ports. Issue occurs when clearing FDB also.
xos0064338	After creating XNV dynamic VLAN with XNV enabled at MLAG port (and its corresponding ISC Port), FDB entry for tracked MAC is learned on base VLAN instead of dynamic VLAN causing flooding and FDB issues.
xos0067335	Memory leak occurs in VMT process when it is enabled on the port.