



# ExtremeXOS Release Notes

*Software Version ExtremeXOS 15.6*

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# 1 Overview

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These release notes document ExtremeXOS® 15.6 which adds features, adds supported hardware, and resolves software deficiencies.

This chapter contains the following sections:

- [New and Corrected Features in ExtremeXOS 15.6 on page 5](#)
- [ExtremeXOS Images for Summit X480 Series Switches on page 15](#)
- [Joint Interoperability Test Command \(JITC\) Compliance on page 17](#)
- [New Hardware Supported in ExtremeXOS 15.6 on page 16](#)
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## **New and Corrected Features in ExtremeXOS 15.6**

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This section lists the new and corrected features supported in the ExtremeXOS 15.6 software:

- [Dynamic Host Configuration Protocol \(DHCP\) v6 RFC3315 Client on page 6](#)
- [Python Scripting on page 7](#)
- [Inter-Virtual Router \(VR\) Routing for IPv4 Unicast Static Routes on page 7](#)
- [Link Aggregation \(LAG\) Configuration Change Does Not Disrupt Spanning Tree Protocol \(STP\) Operation on page 8](#)
- [Enable IProute Compression by Default on page 9](#)
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- [Port-Specific VLAN Tagging on page 13](#)

## Dynamic Host Configuration Protocol (DHCP) v6 RFC3315 Client

The DHCPv6 for IPv6 enables DHCPv6 servers to pass configuration parameters such as IPv6 network addresses to a DHCPv6 client. The basic DHCPv6 client-server concept is similar to DHCP for IPv4. The DHCPv6 server and client exchange IPv6 messages using User Datagram Protocol (UDP.)

### Supported Platforms

- BlackDiamond X8 and BlackDiamond 8800 series switches
- Summit X770, X670, X670-G2, X480, X460, X460-G2, X440, and X430 series switches
- E4G-200 and E4G-400 cell site routers

### Limits

- Stateless Auto-configuration is not supported.
- Stateless DHCPv6 is not supported.
- Rapid-commit option is not supported.
- Temporary Address (IA\_TA) is not supported.
- Prefix Delegation (IA\_PD) is not supported.

### New CLI Commands

```
configure dhcp ipv6 client identifier-type [link-layer
{plus-time} | vendor-specific]
```

### Changed CLI Commands

Changes are bolded:

```
show dhcp-client {ipv4 | ipv6} state {<vlan>}
enable [bootp {ipv4}|dhcp {ipv4 | ipv6}] vlan [<vlan> | all]
disable [bootp {ipv4}|dhcp {ipv4 | ipv6}] vlan [<vlan> | all]
```

## Python Scripting

The **load script <script>** command can now be a Python v2.7.3 compatible script and may interact with the CLI and file system.

### Supported Platforms

- BlackDiamond X8 and BlackDiamond 8800 series switches
- Summit X770, X670, X670-G2, X480, X460, X460-G2, X440, and X430 series switches
- E4G-200 and E4G-400 cell site routers

### Limitations

Only allows a script to interact directly with the CLI interface for managing ExtremeXOS functionality.

### Changed CLI Commands

The **load script <script>** has been modified to accept Python v2.7.3 compatible scripts.

## Inter-Virtual Router (VR) Routing for IPv4 Unicast Static Routes

This feature supports IPv4 Inter-VR routing via static routes.

Virtual routers (VR) allow for separate Layer 3 routing domains. Each VR has its own routing table. VR in this context denotes any routable VR, and includes default VR, user VRs, VPN-VRFs, and non-VPN VRFs.

In some scenarios there is a need for communication between the isolated Layer 3 routing domains in a controlled way. For example, a university might decide to separate Layer 3 traffic on a per-department basis, but each department needs access to certain services provided by the payroll department. To accomplish this, you could install the routes related to those payroll services in the other departments' route tables, with the next hop interface corresponding to the payroll department's VR.

## Deployment Recommendations

To effectively deploy inter-VR routing using static routes, you need unique IP addresses for intended packet flows. Also note that during transient network conditions involving dynamic routing protocols, IP packets on outbound and/or return paths could match a less-specific static inter-VR route and be forwarded into another VR. Therefore, more-specific static inter-VR routes are recommended.

## Supported Platforms

- BlackDiamond X8 and BlackDiamond 8800 series switches
- Summit X770, X670, X670-G2, X480, X460, X460-G2, and X440 series switches
- E4G-200 and E4G-400 cell site routers

## Limitations

This feature is not supported on MPLS, tunnels, or for multicast packets.

## Changed CLI Commands

The following command's syntax has not been changed, but will now accept that the egress VLAN name specified can belong to a different VR than the VR to which the route is added:

```
configure iproute add <ipNetmask> <gateway> {vlan  
<egress_vlan>} {vr <vr_name>}
```

## Link Aggregation (LAG) Configuration Change Does Not Disrupt Spanning Tree Protocol (STP) Operation

Currently, adding or deleting ports from a link aggregation group (LAG) produces the following error:

**Warning: Any config on the master port is lost (STP, IGMP Filter, IGMP Static Group, MAC-Security, CFM, TRILL, etc.)**

The current LAG implementation modifies the switch hardware VLAN interface tables by removing the entire LAG configuration and replaces it with the new LAG configuration. This destruction and recreation of virtual port interfaces may exhibit the characteristics of interface flapping and may cause traffic loss. This behavior is independent of any protocols configured on a LAG interface.

## Supported Platforms

- BlackDiamond X8 and BlackDiamond 8800 series switches
- Summit X770, X670, X670-G2, X480, X460, X460-G2, X440, and X430 series switches
- E4G-200 and E4G-400 cell site routers

## Limitations

- When aggregator membership changes on a LAG, both redistribution of flows, as well as some traffic loss, can occur. The implementation of this feature will not change this behavior.
- This enhancement does not affect the loss of configuration that occurs when executing the **enable sharing** and **disable sharing** commands.

## Changed CLI Commands

After executing either of the following commands there is no loss of configuration nor traffic:

```
configure sharing <port> add ports <port_list>
configure sharing <port> delete ports <port_list>
```

## Enable IProute Compression by Default

Compressed routes reduce the number of routes that are installed in the hardware routing tables. This improves packet forwarding performance when the switch uses hardware routing tables. The hardware routing tables have less storage space than the software, so compressed routes conserve resources and improve scaling.

This feature makes iproute compression on the default virtual router (VR), the default setting for new configurations. Additionally, this feature enables compression for user VR that are created on new and existing configurations. Both the IPv4 and IPv6 address family routing tables support this feature.

## Supported Platforms

- BlackDiamond X8 and BlackDiamond 8800 series switches
- Summit X770, X670, X670-G2, X480, X460, X460-G2, and X440 series switches
- E4G-200 and E4G-400 cell site routers

## Changed CLI Commands

The **show configuration** command now shows compression as the default setting (in bold):

```
# show configuration "rtmgr" detail
#
# Module rtmgr configuration.
#
disable iproute sharing vr VR-Default
disable iproute ipv6 sharing vr VR-Default
disable iproute sharing vr VR-Mgmt
disable iproute ipv6 sharing vr VR-Mgmt
configure iproute priority mpls 20 vr VR-Default
configure iproute priority blackhole 50 vr VR-Default
configure iproute priority static 1100 vr VR-Default
configure iproute priority icmp 1200 vr VR-Default
. . .
enable iproute ipv4 compression
enable iproute ipv6 compression
```

The **show ipconfig** (IP4) command now shows compression as the default setting (in bold):

```
#show ipconfig
    Use Redirects : Disabled
    IpOption LSRR : Enabled
    IpOption SSRR : Enabled
    IpOption RR : Enabled
    IpOption TS : Enabled
    IpOption RA : Enabled
    Route Sharing : Disabled
    Route Compression : Enabled
    Originated Packets : Don't require ipforwarding
    IP Fwding into LSP : Disabled
. . .
```

The **show ipconfig ipv6** command now shows compression as the default setting (in bold):

```
#show ipconfig ipv6
    Route Sharing: Disabled
    Route Compression: Enabled
    ICMP Redirect for Fast Path: Disabled
    Max Shared Gateways: Current: 4 Configured: 4
. . .
```

## Layer 2 Protocol Tunneling (L2PT) and Filtering for Multi-protocol Label Switching (MPLS)

This feature was first introduced in ExtremeXOS 15.5.1. This revision of the feature adds MPLS support. Changes to the feature to provide MPLS supported are marked with bold.

L2PT is useful for connecting remote switches across a service provider network. This feature allows control PDUs to be tunneled through the network, and provides a single STP domain for subscribers across the service provider network. Using tunneling the service provider network can be made transparent to the customer network.

Layer 2 PDU filtering allows a service provider to specify which Layer 2 PDUs are to be dropped at the ingress interface on a provider edge switch. Specified Layer 2 PDU frames are not transmitted over the service provider network.

### Supported Platforms

- BlackDiamond X8 and BlackDiamond 8800<sup>1</sup> series switches
- Summit X770, X670, X670-G2, X480<sup>1</sup>, X460, X460-G2, and X440 series switches
- E4G-200 and E4G-400 cell site routers

### Limitations

Existing limits and new ones for ExtremeXOS 15.6 (in bold):

- L2PT and protocol filtering is implemented in software, thus limiting the number of frames that may be filtered or tunneled.
- Both L2PT and protocol filtering may be configured only through command line interface. Configuration through SNMP/XML is not supported.
- **If L2PT configurations are made on pseudowires, these configurations are lost after restarting the MPLS process unless the L2PT process is also restarted.**
- **If L2PT configurations are made on a VPLS or VPWS service, dot1p tag inclusion must be enabled on the VPLS/VPWS.**
- When tunneling protocols which are point-to-point in nature, you must ensure that there are only two tunnel endpoints for the protocol.

---

1. VPLS/VPWS is not supported on Summit X480 series switches and in BlackDiamond 8800 XL modules.

- If a protocol that is configured to be tunneled on a service interface cannot be uniquely identified by its DA and EtherType, then all packets with the same DA and EtherType of the protocol being tunneled but are not really PDUs of the protocol are slow path forwarded.
- Tagged protocol PDUs cannot be tunneled over VLANs. Tagged protocol PDUs can be tunneled only over VMANs (the VMAN can be the service VMAN for a VPLS/VPWS service or a standalone VMAN). Untagged protocol PDUs can be tunneled over both VLANs and VMANs (the VLAN/VMAN can be standalone or be the service VMAN for a VPLS/VPWS service).
- Untagged protocol PDUs cannot be bypassed if the ingress port is an untagged VMAN port with a default CVID. Untagged protocol PDUs may be bypassed if the ingress port is an untagged VMAN port without a default CVID.
- L2PT is not supported on VLAN ports that have a port specific tag.
- **In VPLS, only full-mesh configuration is supported for L2PT.**
- L2PT for VPLS/VPWS is not supported.

### Existing CLI Commands

- `configure protocol filter <filter_name> [add | delete] dest-mac <mac_address> {[etype | llc | snap] <hex>} {field offset <offset> value <value> {mask <mask>}}`
- `configure l2pt encapsulation dest-mac <mac_address>`
- `show l2pt`
- `create l2pt profile <profile_name>`
- `delete l2pt profile <profile_name>`
- `configure l2pt profile <profile_name> add protocol filter <filter_name> {action [tunnel {cos <cos>} | encapsulate | none]}`
- `configure l2pt profile <profile_name> delete protocol filter <filter_name>`
- `show l2pt profile {<profile_name>}`
- `configure [vlan | vman] <vlan_name> ports <port_list> l2pt profile [none | <profile_name>]`
- `show [vlan | vman] <vlan_name> {ports <port_list>} l2pt {detail}`
- `clear l2pt counters {[vlan | vman] <vlan_name> {ports <port_list>}}`

- configure ports [<port\_list> | all] protocol filter [none | <filter\_name>]
- show ports [<port\_list> | all] protocol filter {detail}
- clear counters ports {<port\_list> | all} protocol filter
- create protocol {filter} <filter\_name>
- delete protocol {filter} <filter\_name>
- configure protocol {filter} <filter\_name> [add | delete] [etype | llc | snap] <hex> {[etype | llc | snap] <hex>} {[etype | llc | snap] <hex>} {[etype | llc | snap] <hex>}
- show protocol {filter} {<filter\_name>} {detail}
- configure {vlan} <vlan\_name> protocol {filter} <filter\_name>

## Port-Specific VLAN Tagging

This feature allows bridging of frames with different VLAN IDs that have been trunked by third-party equipment. Frames with different VLAN IDs are treated as belonging to the same VLAN.

Different VLAN IDs can be on different ports or on the same ports. Different VLAN IDs are used to accept packets to the VLAN, and the right VLAN ID is used when forwarding the frames out. The same VLAN ID on different ports can be associated with different VLANs. Forwarding can also be done over L2VPN when the switches are connected with pseudowires.

This feature was first introduced in ExtremeXOS 15.4.1. This revision of the feature allows VLANs which have port-specific tags to be an EAPS-protected VLAN, provided that the port-specific tag “attachments” is not configured on the EAPS (primary and secondary) ring ports. Changes to the feature to support this enhancement are marked with bold.

### *Supported Platforms*

- BlackDiamond 8800 xl-series only switches
- BlackDiamond X8 series switches
- Summit X480, X460, X460-G2, X670, X670-G2, and X770 series switches
- E4G-400 and E4G-200 cell site routers

## Limitations

- Protocols are not supported on port-specific VLAN tags. They are prevented from being configured. **VLANs which have port-specific tags may be EAPS-protected VLANs, provided that the port-specific tag “attachments” is not configured on the EAPS (primary and secondary) ring ports.**
- VMANs are not supported.
- Configuration input and output are only through the CLI.
- IP unicast/multicast forwarding is not supported.
- Within a single broadcast domain (VLAN) there is only one MAC address. When a MAC address is learned on different tag (on the same port or on a different port), it is considered a MAC move.
- Multicast is not supported. Internet Group Management Protocol (IGMP) snooping must be disabled.
- VLAN translation functionality is essentially provided by VLAN bridging tag, so VLAN bridging tag cannot be part of VLAN translation (either as a translation VLAN, or a member VLAN).
- VLANs with a port-specific tag cannot be part of a private VLAN.
- Remote-mirroring is not supported on VLANs with port-specific tags.

### *Changed CLI Commands in ExtremeXOS 15.4.1*

- `configure {vlan} vlan_name add ports [port_list | all] {tagged {<tag>} | untagged} [{stpd} stpd_name] {dot1d | emistp | pvst-plus}}`
- `configure {vlan} vlan_name delete ports [all | port_list {tagged <tag>}]`
- `create fdbentry <mac_addr> vlan <vlan_name> [ports <port_list> {tagged <tag>} | blackhole]`
- `configure ports port_list {tagged <tag>} vlan vlan_name [limit-learning number {action[blackhole | stop-learning]} | lock-learning | unlimited-learning | unlocklearning]`

Additionally, the output of the following commands is modified to show VLAN bridging information:

- `show vlan`
- `show port info detail`
- `show fdb`

## ExtremeXOS Images for Summit X480 Series Switches

Due to additional functionality and new platforms supported, the ExtremeXOS 15.6 software image is too large to download onto the Summit X480 series switches. To resolve this issue, Summit X480 series switches now have two separate software image files used for both individual switches and stacks that include Summit X480 series switches.

**Table 1: Summit X480 Series Switches Software Image Files**

|                           | Main Install image                                                                                                                                                                                                                                                                                                                                                                                                           | Diagnostic image                                                                                                                                                                                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Content</b>            | All Summit X480 content (except diagnostics)                                                                                                                                                                                                                                                                                                                                                                                 | Summit X480 diagnostics                                                                                                                                                                                                                                                                           |
| <b>File Name</b>          | <code>summitX480-15.6.xx.yy.xos</code>                                                                                                                                                                                                                                                                                                                                                                                       | <code>summitX480-15.6.xx.yy-diagnostics.xmod</code>                                                                                                                                                                                                                                               |
| <b>File Type</b>          | Standard ExtremeXOS image                                                                                                                                                                                                                                                                                                                                                                                                    | XMOD image                                                                                                                                                                                                                                                                                        |
| <b>Installation Notes</b> | <ul style="list-style-type: none"> <li>Installing the main SummitX480 image over a previous release leaves the previous installation of the diagnostics image intact, as it is stored separately from the main ExtremeXOS image. You can continue to use the previously installed diagnostic version to run diagnostics.</li> <li>The Summit XMODs, such as SSH can be used with the summitX480 ExtremeXOS image.</li> </ul> | To update to a newer version of the diagnostics, you download and install the latest XMOD version. The diagnostics XMOD can be installed to the active or standby partition and diagnostics can be used immediately. There is no need to reboot or any other action to complete the installation. |

The following scenarios will produce an error or warning message:

- Not having the diagnostic image installed on a Summit X480 series switch or slot.
- Installing the main Summit X480 image without the diagnostics image present.
- Installing the general Summit image (`summitX-15.6.xx.yy.xos`, rather than the Summit X480-specific image) on a Summit X480 series switch.

**NOTE**

If Summit X480 series switches require rescue recovery, you can use the **summitX-15.6.xx.yy.xos** file image, and this image installs the diagnostics capability.

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## New Hardware Supported in ExtremeXOS 15.6

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This section lists the new hardware supported in ExtremeXOS 15.6:

- Summit X670-G2 series switches:

X670-G2-48X-4q and X670-G2-72X

- Summit X460-G2 series switches:

X460-G2-24t-10GE4, X460-G2-48t-10GE4, X460-G2-24p-10GE4, X460-G2-48p-10GE4, X460-G2-24x-10GE4, X460-G2-48x-10GE4, X460-G2-24t-GE4, X460-G2-48t-GE4, X460-G2-24p-GE4, and X460-G2-48p-GE4

**NOTE**

On the Summit X670-G2 series switches, the Management Port LED does not work at 10M link speed (LED is off in 10M mode). The 1G and 100M LEDs do function properly.

**NOTE**

The Summit X460-G2 series switches do not support half duplex.

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## Hardware Issues in ExtremeXOS 15.6

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The E4G-200 cell site router front panel alarm DB15 connector capabilities are not currently supported.

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## Joint Interoperability Test Command (JITC) Compliance

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If you require Joint Interoperability Test Command (JITC) compliance, you can use the command `configure snmp compatibility get-bulk reply-too-big-action [standard | too-big-error]` to change ExtremeXOS from Ridgeline-compatible mode (**standard**), the default mode, to JITC-compliant mode (**too-big-error**).

Please note that switching to JITC-compliant mode causes Ridgeline to display potentially unreliable information.

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## ExtremeXOS Hardware and Software Compatibility Matrix

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The *ExtremeXOS Hardware and Software Compatibility Matrix* provides information about the minimum version of ExtremeXOS software required to support BlackDiamond and Summit switches, as well as SFPs, XENPAKs, XFPs, and other pluggable interfaces.

The latest version of the *ExtremeXOS Hardware and Software Compatibility Matrix* can be found at:

[www.extremenetworks.com/documentation](http://www.extremenetworks.com/documentation)

## Upgrading to ExtremeXOS

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For instructions about upgrading ExtremeXOS software, see the “Software Upgrade and Boot Options” chapter in the Basic Switch Operation volume of the *ExtremeXOS User Guide*. The following are miscellaneous hitless upgrade notes:

- 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."** is displayed. An ExtremeXOS modular software package (.xmod file) can still be downloaded and installed on either the active or alternate partition.
- SummitX software is required for E4G cell site routers.
- Beginning with ExtremeXOS 15.4, a limited hitless upgrade procedure is supported on the BlackDiamond X8 and BlackDiamond 8800 series switches

## Downloading Supported MIBs

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The Extreme Networks MIBs are located on the eSupport website under Download Software Updates, located at:

<https://esupport.extremenetworks.com/>

## Tested Third-Party Products

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This section lists the third-party products tested for ExtremeXOS 15.5.

### 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

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### 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

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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/services/service\\_notification\\_form.aspx](http://www.extremenetworks.com/services/service_notification_form.aspx)

# 2 Limits

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This chapter summarizes the supported limits in ExtremeXOS 15.6.

**Table 2** summarizes 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.



## NOTE

The term “BlackDiamond 8000 e-series” refers to all BlackDiamond 8500 e-series and 8800 e-series modules. The term “BlackDiamond 8000 series” refers to all BlackDiamond 8500, 8800, and 8900 series modules.

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The scaling and performance information shown in **Table 2** 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 **Table 2** 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 table.

On products other than the BlackDiamond 8900 xl-series, BlackDiamond X8 series, and Summit X480 series, it is not advised to have greater than 25,000 total IP routes from all routing protocols. Adverse effects can occur with routing tables larger than this, especially when a single network event or CLI command affects a significant number of routes. For example, just after such a network event, the added system load will cause a **save configuration** command to time out.

Table 2: Supported Limits

| Metric                                                                                     | Product                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Limit                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AAA (local)</b> —maximum number of admin and local user accounts.                       | All platforms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Access lists (meters)</b> —maximum number of meters.                                    | BlackDiamond 8000 series<br>e-series, group of 24 ports<br>c-series<br><br>BlackDiamond 8900 series<br>8900-10G24X-c, group of 12 ports<br><br>8900 xl-series, 8900-G96T-c<br><br>8900-40G6X-xm<br><br>BlackDiamond X8 a-series modules<br><br>BlackDiamond X8-100G4X modules<br><br>E4G-200<br><br>Summit X440, X430 per group of 24 ports<br>Summit X460, E4G-400, per group of 24 ports<br><br>Summit X480<br><br>Summit X670 with VIM4-40G4x<br>Summit X480 with VIM3-40G4X<br><br>Summit X770, X670-G2, X460-G2 | 512<br>2,048 ingress,<br>256 egress<br><br>1,024 ingress,<br>256 egress<br><br>4,096 ingress,<br>512 egress<br><br>512 ingress<br>512 egress<br><br>512 ingress,<br>512 egress<br><br>8,192 ingress,<br>1,024 egress<br><br>1,024 ingress<br>256 egress<br><br>512 ingress<br><br>2,048 ingress,<br>256 egress<br><br>4,096 ingress,<br>512 egress<br><br>512 ingress<br>512 egress<br><br>1,024 ingress,<br>512 egress |
| <b>Access lists (policies)</b> —suggested maximum number of lines in a single policy file. | All platforms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 300,000                                                                                                                                                                                                                                                                                                                                                                                                                 |

Table 2: Supported Limits (Continued)

| Metric                                                                                        | Product                                                       | Limit                                            |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------|
| <b>Access lists (policies)</b> —maximum number of rules in a single policy file. <sup>a</sup> | BlackDiamond 8000 series<br>c-series, group of 24 ports       | 4,096 ingress,<br>512 egress                     |
|                                                                                               | e-series, group of 24 ports                                   | 1,024 ingress                                    |
|                                                                                               | BlackDiamond 8900<br>8900-10G24X-c modules, group of 12 ports | 2,048 ingress,<br>512 egress                     |
|                                                                                               | 8900-G96T-c modules, group of 48 ports                        | 8,192 ingress,<br>1,024 egress                   |
|                                                                                               | 8900 xl-series<br>8900-40G6X-xm                               | 61,440 (up to)<br>2,048 ingress,<br>1,024 egress |
|                                                                                               | BlackDiamond X8 a-series modules                              | 2,048 ingress,<br>1,024 egress                   |
|                                                                                               | BlackDiamond X8-100G4X modules                                | 8,192 ingress,<br>1,024 egress                   |
|                                                                                               | Summit X440, X430 group of 24 ports                           | 1,024 ingress                                    |
|                                                                                               | Summit X460, E4G-400                                          | 4,096 ingress,<br>512 egress                     |
|                                                                                               | Summit X480                                                   | (up to) 61,440 ingress,<br>1,024 egress          |
|                                                                                               | Summit X670<br>VIM4-40G4x                                     | 2,048 ingress<br>1,024 egress                    |
|                                                                                               | Summit X480                                                   | 8,192 ingress/<br>1,024 egress                   |
|                                                                                               | Summit X480<br>VIM3-40G4X                                     | 2048 ingress<br>1024 egress                      |
|                                                                                               | Summit X770, X670-G2, X460-G2                                 | 4,096 ingress<br>1,024 egress                    |
|                                                                                               | E4G-200                                                       | 2,048 ingress/<br>512 egress                     |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                            | Product                                                                 | Limit                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------|
| <b>Access lists (slices)</b> —number of ACL slices.                                                                                                               | BlackDiamond 8000 series<br>c-series, group of 48 ports                 | 16                                   |
|                                                                                                                                                                   | BlackDiamond 8900 series<br>8900-10G24X-c modules, group of 12 ports    | 12 ingress,<br>4 egress              |
|                                                                                                                                                                   | 8900-G96T-c modules, group of 48 ports                                  | 16 ingress,<br>4 egress              |
|                                                                                                                                                                   | 8900 xl-series                                                          | 17 <sup>b</sup>                      |
|                                                                                                                                                                   | 8900-40G6X-xm                                                           | 10 ingress,<br>4 egress              |
|                                                                                                                                                                   | BlackDiamond X8 a-series modules                                        | 10 ingress,<br>4 egress              |
|                                                                                                                                                                   | BlackDiamond X8-100G4X modules                                          | 16 ingress,<br>4 egress              |
|                                                                                                                                                                   | E4G-200                                                                 | 8 ingress,<br>4 egress               |
|                                                                                                                                                                   | Summit X440, X430                                                       | 4 ingress                            |
|                                                                                                                                                                   | Summit X460, E4G-400, X460-G2                                           | 16 ingress,<br>4 egress              |
|                                                                                                                                                                   | Summit X480                                                             | 17 <sup>b</sup> ingress,<br>4 egress |
|                                                                                                                                                                   | Summit X670<br>VIM4-40G4x                                               | 10 ingress,<br>4 egress              |
|                                                                                                                                                                   | Summit X480<br>VIM3-40G4X                                               | 10 ingress,<br>4 egress              |
|                                                                                                                                                                   | Summit X770, X670-G2                                                    | 12 ingress<br>4 egress               |
| <b>AVB (audio video bridging)</b> —maximum number of active streams.<br><b>NOTE:</b> * It is recommended that you do not use on more than 8 ports on this switch. | Summit X440, X460, X460-G2<br>Summit X670, X670, X670-G2<br>Summit X430 | 1,024<br>4,096<br>100*               |
| <b>BFD sessions</b> —maximum number of BFD sessions.                                                                                                              | All platforms (default timers—1 sec)                                    | 512                                  |
|                                                                                                                                                                   | BlackDiamond X8 and 8800<br>(minimal timers—50 msec)                    | 10 <sup>c</sup>                      |
|                                                                                                                                                                   | All Summits<br>(minimal timers—100 msec)                                | 10 <sup>c</sup>                      |

Table 2: Supported Limits (Continued)

| Metric                                                                                                     | Product                                                                            | Limit                        |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------|
| <b>BGP (aggregates)</b> —maximum number of BGP aggregates.                                                 | All platforms (except X430 and X440) with Core license or higher                   | 256                          |
| <b>BGP (networks)</b> —maximum number of BGP networks.                                                     | All platforms (except X430, and X440) with Core license or higher                  | 1,024                        |
|                                                                                                            | BlackDiamond X8 series                                                             | 1,024                        |
| <b>BGP (peers)</b> —maximum number of BGP peers.<br><b>NOTE:</b> * With default keepalive and hold timers. | BlackDiamond X8 series                                                             | 512                          |
|                                                                                                            | BlackDiamond 8000 series                                                           | 512                          |
|                                                                                                            | BlackDiamond xl-series                                                             | 512                          |
|                                                                                                            | All Summits, except X480                                                           | 128*                         |
|                                                                                                            | E4G-400, E4G-200                                                                   | 128*                         |
|                                                                                                            | Summit X480                                                                        | 512                          |
| <b>BGP (peer groups)</b> —maximum number of BGP peer groups.                                               | BlackDiamond 8900 series                                                           | 128                          |
|                                                                                                            | BlackDiamond 8800                                                                  | 64                           |
|                                                                                                            | BlackDiamond X8 series                                                             | 128                          |
|                                                                                                            | Summit X480                                                                        | 128                          |
|                                                                                                            | Summit X770, X670-G2, X670v-48t, X670, X460-G2, X460 (with Core license or higher) | 64                           |
|                                                                                                            |                                                                                    |                              |
| <b>BGP (policy entries)</b> —maximum number of BGP policy entries per route policy.                        | All platforms (except X430 and X440) with Core license or higher                   | 256                          |
| <b>BGP (policy statements)</b> —maximum number of BGP policy statements per route policy.                  | All platforms (except X430 and X440) with Core license or higher                   | 1,024                        |
| <b>BGP multi-cast address-family routes</b> —maximum number of multi-cast address-family routes.           | BlackDiamond 8900 xl-series                                                        | 524,256 (up to) <sup>b</sup> |
|                                                                                                            | BlackDiamond X8 series                                                             | 25,000                       |
|                                                                                                            | Summit X460, X460-G2, X670, X670-G2, X770,                                         | 25,000                       |
|                                                                                                            | Summit X480                                                                        | 524,256 (up to) <sup>b</sup> |
|                                                                                                            | E4G-200, E4G-400                                                                   | 25,000                       |
| <b>BGP (unicast address-family routes)</b> —maximum number of unicast address-family routes.               | BlackDiamond 8900 xl-series                                                        | 524,256 (up to) <sup>b</sup> |
|                                                                                                            | BlackDiamond X8 series                                                             | 25,000                       |
|                                                                                                            | Summit X460, X460-G2, X670, X670-G2, X770                                          | 25,000                       |
|                                                                                                            | Summit X480                                                                        | 524,256 (up to) <sup>b</sup> |
|                                                                                                            | E4G-200, E4G-400                                                                   | 25,000                       |
|                                                                                                            |                                                                                    |                              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                           | Product                                                                                                                                                                                                    | Limit                                                                |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>BGP (non-unique routes)</b> —maximum number of non-unique BGP routes.                                                         | BlackDiamond 8900 xl-series<br>BlackDiamond X8 series<br>Summit X460, X460-G2, X670, X670-G2, X770<br>Summit X480<br>E4G-400, E4G-200                                                                      | 1,200,000<br>24,000<br>25,000<br>1,000,000<br>25,000                 |
| <b>BGP ECMP</b> —maximum number of equalcost multipath for BGP and BGPv6.                                                        | All platforms, except Summit X430 and X440                                                                                                                                                                 | 2, 4, or 8                                                           |
| <b>BGPv6 (unicast address-family routes)</b> —maximum number of unicast address family routes.                                   | BlackDiamond 8900 xl-series<br>BlackDiamond 8800 c-series<br>BlackDiamond 8000 e-series<br>BlackDiamond X8 series<br>Summit X460, X460-G2<br>Summit X480<br>Summit X670, X670-G2, X770<br>E4G-200, E4G-400 | 20,000<br>6,000<br>240<br>8,000<br>6,000<br>20,000<br>8,000<br>6,000 |
| <b>BGPv6 (non-unique routes)</b> —maximum number of non-unique BGP routes                                                        | BlackDiamond 8900 xl-series<br>BlackDiamond 8800 c-series<br>BlackDiamond 8000 e-series<br>BlackDiamond X8 series<br>Summit X460, X460-G2<br>Summit X480, X670, X670-G2, X770<br>E4G-200, E4G-400          | 24,000<br>18,000<br>720<br>24,000<br>18,000<br>24,000<br>18,000      |
| <b>BOOTP/DHCP relay</b> —maximum number of BOOTP or DHCP servers per virtual router.                                             | All platforms, except Summit X430                                                                                                                                                                          | 4                                                                    |
| <b>BOOTP/DHCP relay</b> —maximum number of BOOTP or DHCP servers per VLAN.                                                       | All platforms, except Summit X430                                                                                                                                                                          | 4                                                                    |
| <b>CES TDM pseudowires</b> —maximum number of CES TDM pseudowires per switch.                                                    | E4G-200 and E4G-400                                                                                                                                                                                        | 256                                                                  |
| <b>Connectivity fault management (CFM)</b> —maximum number or CFM domains.<br><b>NOTE:</b> With Advanced Edge license or higher. | All platforms                                                                                                                                                                                              | 8                                                                    |
| <b>CFM</b> —maximum number of CFM associations.<br><b>NOTE:</b> With Advanced Edge license or higher.                            | All platforms                                                                                                                                                                                              | 256                                                                  |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                        | Product                                                               | Limit   |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------|
| <b>CFM</b> —maximum number of CFM up end points.<br><b>NOTE:</b> With Advanced Edge license or higher.                                        | BlackDiamond 8000 series                                              | 32      |
|                                                                                                                                               | BlackDiamond X8 series                                                | 32      |
|                                                                                                                                               | Summit series                                                         | 32      |
| <b>CFM</b> —maximum number of CFM down end points.<br><b>NOTE:</b> With Advanced Edge license or higher.                                      | BlackDiamond 8000 series                                              | 32      |
|                                                                                                                                               | BlackDiamond X8 series                                                | 32      |
|                                                                                                                                               | Summit series X460, X460-G2, E4G-200, E4G-400 (non-load shared ports) | 256     |
|                                                                                                                                               | Summit series X460, X460-G2, E4G-200, E4G-400 (load shared ports)     | 32      |
|                                                                                                                                               | All other platforms                                                   | 32      |
| <b>CFM</b> —maximum number of CFM remote end points per up/down end point.<br><b>NOTE:</b> With Advanced Edge license or higher.              | All platforms                                                         | 2,000   |
| <b>CFM</b> —maximum number of dot1ag ports.<br><b>NOTE:</b> With Advanced Edge license or higher.                                             | All Summits, except X430                                              | 128     |
| <b>CFM</b> —maximum number of CFM segments.<br><b>NOTE:</b> With Advanced Edge license or higher.                                             | All platforms                                                         | 1,000   |
| <b>CFM</b> —maximum number of MIPs.<br><b>NOTE:</b> With Advanced Edge license or higher.                                                     | All platforms                                                         | 256     |
| <b>CLEAR-Flow</b> —total number of rules supported. The ACL rules plus CLEAR-Flow rules must be less than the total number of supported ACLs. | Summit X440, X430                                                     | 1,024   |
|                                                                                                                                               | Summit X670                                                           | 2,048   |
|                                                                                                                                               | Summit X460, X460-G2, X770, X670-G2                                   | 4,096   |
|                                                                                                                                               | Summit X480                                                           | 8,192   |
|                                                                                                                                               | E4G-200                                                               | 2,048   |
|                                                                                                                                               | E4G-400                                                               | 4,094   |
| <b>Data Center Bridging eXchange (DCBX) protocol Type Length Value (TLVs)</b> —maximum number of DCBX application TLVs.                       | All platforms                                                         | 8       |
| <b>Dynamic ACLs</b> —maximum number of ACLs processed per second.<br><b>NOTE:</b> Limits are load dependent.                                  | Summit X480, X670<br>with 50 DACLs<br>with 500 DACLs                  | 10<br>5 |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                               | Product                                             | Limit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|
| <b>EAPS domains</b> —maximum number of EAPS domains.<br><b>NOTE:</b> An EAPS ring that is being spatially reused cannot have more than four configured EAPS domains. | BlackDiamond 8000 series                            | 64    |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 64    |
|                                                                                                                                                                      | Summit series (except X430, X440), E4G-200, E4G-400 | 32    |
|                                                                                                                                                                      | Summit X430                                         | 4     |
| <b>EAPSV1 protected VLANs</b> —maximum number of protected VLANs.                                                                                                    | BlackDiamond 8000 series                            | 2,000 |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 4,000 |
|                                                                                                                                                                      | Summit series, E4G-200, E4G-400                     | 1,000 |
| <b>EAPSV2 protected VLANs</b> —maximum number of protected VLANs.                                                                                                    | BlackDiamond 8000 series                            | 2,000 |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 4,000 |
|                                                                                                                                                                      | All Summits (except X440), E4G-200, E4G-400         | 500   |
|                                                                                                                                                                      |                                                     | 500   |
| <b>ELSM (vlan-ports)</b> —maximum number of VLAN ports.                                                                                                              | BlackDiamond 8000 series                            | 5,000 |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 5,000 |
|                                                                                                                                                                      | All Summits (except X430, X440), E4G-200, E4G-400   | 5,000 |
| <b>ERPS domains</b> —maximum number of ERPS domains without CFM configured                                                                                           | BlackDiamond 8806 series                            | 32    |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 32    |
|                                                                                                                                                                      | Summit series (except X430, X440), E4G-200, E4G-400 | 32    |
|                                                                                                                                                                      | Summit X430                                         | 4     |
| <b>ERPS domains</b> —maximum number of ERPS domains with CFM configured.                                                                                             | BlackDiamond 8806 series                            | 16    |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 16    |
|                                                                                                                                                                      | Summit X770, X670, X670-G2, X480, X460-G2           | 16    |
|                                                                                                                                                                      | Summit X460                                         | 32    |
|                                                                                                                                                                      | Summit X430                                         | 4     |
|                                                                                                                                                                      | E4G-200, E4G-400                                    | 32    |
| <b>ERPSV1 protected VLANs</b> —maximum number of protected VLANs.                                                                                                    | BlackDiamond 8806 series                            | 2,000 |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 2,000 |
|                                                                                                                                                                      | All Summits (except X440), E4G-200, E4G-400         | 1,000 |
| <b>ERPSV2 protected VLANs</b> —maximum number of protected VLANs                                                                                                     | BlackDiamond 8806 series                            | 2,000 |
|                                                                                                                                                                      | BlackDiamond X8 series                              | 2,000 |
|                                                                                                                                                                      | All Summits (except X430, X440), E4G-200, E4G-400   | 500   |
|                                                                                                                                                                      |                                                     |       |
| <b>ESRP groups</b> —maximum number of ESRP groups.                                                                                                                   | All platforms                                       | 7     |
| <b>ESRP domains</b> —maximum number of ESRP domains.                                                                                                                 | All platforms, except Summit X430, X440             | 64    |

Table 2: Supported Limits (Continued)

| Metric                                                                     | Product                         | Limit      |
|----------------------------------------------------------------------------|---------------------------------|------------|
| <b>ESRP VLANs</b> —maximum number of ESRP VLANs.                           | BlackDiamond 8000/8900 series   | 1,000      |
|                                                                            | BlackDiamond X8                 | 2,048      |
|                                                                            | All Summits (except X430, X440) | 1,000      |
|                                                                            | E4G-200, E4G-400                | 1,000      |
| <b>ESRP (maximum ping tracks)</b> —maximum number of ping tracks per VLAN. | All platforms                   | 8          |
| <b>ESRP (IP route tracks)</b> —maximum IP route tracks per VLAN.           | All platforms                   | 8          |
| <b>ESRP (VLAN tracks)</b> —maximum number of VLAN tracks per VLAN.         | All platforms                   | 1          |
| <b>Forwarding rate</b> —maximum L2/L3 software forwarding rate.            | BlackDiamond 8000 series        | 10,000 pps |
|                                                                            | BlackDiamond X8 series          | 20,000 pps |
|                                                                            | Summit X770                     | 13,842 pps |
|                                                                            | Summit X670-G2                  | 29,028 pps |
|                                                                            | Summit X670                     | 14,829 pps |
|                                                                            | Summit X480                     | 14,509 pps |
|                                                                            | Summit X460-G2                  | 29,037 pps |
|                                                                            | Summit X460                     | 5,222 pps  |
|                                                                            | Summit X440                     | 5,418 pps  |
|                                                                            | E4G-200                         | 8,718 pps  |
|                                                                            | E4G-400                         | 5,536 pps  |

Table 2: Supported Limits (Continued)

| Metric                                                                                      | Product                                                   | Limit                           |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------|
| <b>FDB (blackhole entries)</b> —<br>maximum number of unicast<br>blackhole FDB entries.     | BlackDiamond 8800 c-series                                | 32,000                          |
|                                                                                             | BlackDiamond 8000 e-series                                | 8,000                           |
|                                                                                             | BlackDiamond 8900 series                                  |                                 |
|                                                                                             | 8900 c-series                                             | 32,000                          |
|                                                                                             | 8900 xl-series                                            | 524,288 (up<br>to) <sup>b</sup> |
|                                                                                             | 8900-40G6X-xm                                             | 128,000                         |
|                                                                                             | BlackDiamond X8 a-series modules                          | 128,000                         |
|                                                                                             | BlackDiamond X8-100G4X modules                            | 384,000                         |
|                                                                                             | E4G-200, E4G-400                                          | 32,000                          |
|                                                                                             | Summit X440, X430                                         | 16,000                          |
|                                                                                             | Summit X480                                               | 524,288 (up<br>to) <sup>b</sup> |
|                                                                                             | Summit X460                                               | 32,000                          |
|                                                                                             | Summit X460-G2                                            | 49,000 <sup>d</sup>             |
|                                                                                             | Summit X670 VIM4-40G4x,<br>X480 VIM3-40G4X                | 128,000                         |
|                                                                                             | Summit X770                                               | 288,000 <sup>d</sup>            |
|                                                                                             | Summit X670-G2                                            | 292,000 <sup>d</sup>            |
|                                                                                             | Summit X670, X670v-48t                                    | 130,000 <sup>d</sup>            |
| <b>FDB (blackhole entries)</b> —<br>maximum number of multi-<br>cast blackhole FDB entries. | BlackDiamond 8000 series                                  | 1,024                           |
|                                                                                             | BlackDiamond X8 series                                    | 1,024                           |
|                                                                                             | Summit X480, X460-G2, X460,<br>X440, X430                 | 1,024                           |
|                                                                                             | Summit X770, X670, X670-G2,<br>X670v-48t, X480 VIM3-40G4X | 4,096                           |
|                                                                                             | E4G-200, E4G-400                                          | 1,024                           |

Table 2: Supported Limits (Continued)

| Metric                                                                     | Product                                           | Limit                        |
|----------------------------------------------------------------------------|---------------------------------------------------|------------------------------|
| <b>FDB (maximum L2 entries)</b> —maximum number of MAC addresses.          | BlackDiamond 8000 c-series                        | 32,768 <sup>e</sup>          |
|                                                                            | BlackDiamond 8000 e-series                        | 8,192 <sup>e</sup>           |
|                                                                            | BlackDiamond 8000 (system), except 8900 xl-series | 128,000 <sup>e</sup>         |
|                                                                            | BlackDiamond 8900 xl-series                       | 524,488 (up to) <sup>b</sup> |
|                                                                            | BlackDiamond X8 a-series modules                  | 128,000 <sup>e</sup>         |
|                                                                            | BlackDiamond X8-100G4X modules                    | 384,000 <sup>e</sup>         |
|                                                                            | E4G-200, E4G-400                                  | 32,000 <sup>e</sup>          |
|                                                                            | Summit X440, X430                                 | 16,000 <sup>e</sup>          |
|                                                                            | Summit X480                                       | 524,488 (up to) <sup>b</sup> |
|                                                                            | VIM3-40G4X module                                 | 128,000 <sup>e</sup>         |
|                                                                            | Summit X460                                       | 32,000 <sup>e</sup>          |
|                                                                            | Summit X460-G2                                    | 98,000 <sup>d</sup>          |
|                                                                            | SummitStack (except X480)                         | 128,000 <sup>e</sup>         |
|                                                                            | Summit X670                                       | 128,000 <sup>e</sup>         |
|                                                                            | Summit X770                                       | 288,000 <sup>d e</sup>       |
|                                                                            | Summit X670-G2                                    | 294,000 <sup>d</sup>         |
| <b>FDB (Maximum L2 entries)</b> —maximum number of multi-cast FDB entries. | BlackDiamond X8                                   | 1,024                        |
|                                                                            | BlackDiamond 8800                                 | 1,024                        |
|                                                                            | Summit X770, X670, X670-G2                        | 4,096                        |
|                                                                            | Summit X480, X460, X460-G2, X430, X440            | 1,024                        |
|                                                                            | E4G-200, E4G-400                                  | 1,024                        |
| <b>FIP Snooping VLANs</b>                                                  | BlackDiamond X8                                   | 768                          |
|                                                                            | BlackDiamond 8800 (8900-40G6X-c only)             |                              |
|                                                                            | Summit X670                                       |                              |
| <b>FIP Snooping Virtual Links (FPMA mode) per port group</b>               | BlackDiamond X8                                   | 1,908                        |
|                                                                            | BlackDiamond 8800 (8900-40G6X-c only)             |                              |
|                                                                            | Summit X670                                       |                              |
| <b>FIP Snooping FCFs (with perimeter port) per port group</b>              | BlackDiamond X8                                   | 238                          |
|                                                                            | BlackDiamond 8800 (8900-40G6X-c only)             |                              |
| <b>FIP Snooping FCFs (with Enode-to-FCF port)</b>                          | BlackDiamond X8                                   | 212                          |
|                                                                            | BlackDiamond 8800 (8900-40G6X-c only)             |                              |
|                                                                            | Summit X670                                       |                              |

Table 2: Supported Limits (Continued)

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

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                           | Product                            | Limit               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|
| <b>Identity management</b> —maximum number of dynamic ACL entries configured as an individual dynamic rule, or as an ACL entry in a policy file.                 | All platforms.                     | 500                 |
| <b>IGMP sender</b> —maximum number of IGMP senders per switch (IP multi-cast compression disabled). <sup>k</sup><br><b>NOTE:</b> Assumes source-group-vlan mode. | BlackDiamond 8800 c-series         | 2,048 <sup>f</sup>  |
|                                                                                                                                                                  | BlackDiamond 8000 e-series         | 500 <sup>g</sup>    |
|                                                                                                                                                                  | BlackDiamond 8900-10G24X-c modules | 2,048 <sup>f</sup>  |
|                                                                                                                                                                  | BlackDiamond 8900-G96T-c modules   | 4,096 <sup>f</sup>  |
|                                                                                                                                                                  | BlackDiamond 8900-40G6X-xm         | 3,000 <sup>g</sup>  |
|                                                                                                                                                                  | BlackDiamond 8900 xl-series        | 4,096 <sup>f</sup>  |
|                                                                                                                                                                  | BlackDiamond X8 a-series modules   | 4,096 <sup>h</sup>  |
|                                                                                                                                                                  | BlackDiamond X8-100G4X             | 16,384 <sup>d</sup> |
|                                                                                                                                                                  | E4G-200, E4G-400                   | 2,048               |
|                                                                                                                                                                  | Summit X440                        | 64                  |
|                                                                                                                                                                  | Summit X480                        | 4,096               |
|                                                                                                                                                                  | Summit X460                        | 2,048               |
|                                                                                                                                                                  | Summit X460-G2                     | 4,096               |
|                                                                                                                                                                  | Summit X670                        |                     |
|                                                                                                                                                                  | VIM4-40G4x                         | 3,000 <sup>g</sup>  |
|                                                                                                                                                                  | Summit X670-G2                     | 4,096 <sup>g</sup>  |
|                                                                                                                                                                  | Summit X770                        | 4,096               |
|                                                                                                                                                                  | Summit X430                        | 64                  |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                                                                                          | Product                            | Limit                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------|
| <b>IGMP sender</b> —maximum number of IGMP senders per switch (IP multi-cast compression enabled). <sup>k</sup><br><b>NOTE:</b> Assumes source-group-vlan mode.<br>For additional limits, see: <ul style="list-style-type: none"> <li>Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. on page 46</li> <li>Layer-2 IPMC forwarding caches— (IGMP/MLD/PIM snooping) in mixed-mode. on page 46</li> </ul> | BlackDiamond 8800 c-series         | 2,048 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8000 e-series         | 500 <sup>g</sup>     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900-10G24X-c modules | 2,048 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900-G96T-c modules   | 4,096 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900-40G6X-xm         | 3,000 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900 xl-series        | 4,096 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond X8 a-series modules   | 4,096 <sup>b</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond X8-100G4X modules     | 16,384 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | E4G-200                            | 3,000 <sup>g h</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | E4G-400                            | 6,000 <sup>g h</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X440                        | 192 <sup>g</sup>     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X460                        | 6,000 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X460-G2                     | 21,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X480                        | 12,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X670                        | 3,000 <sup>g</sup>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | VIM4-40G4x                         | 12,000 <sup>b</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X770, X670-G2               | 66,500 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X430                        | 192                  |
| <b>IGMP snooping per VLAN filters</b> —maximum number of VLANs supported in per-VLAN IGMP snooping mode.                                                                                                                                                                                                                                                                                                                        | BlackDiamond 8800 c-series         | 2,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8000 e-series         | 448                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900 c-series         | 1,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900 xl-series        | 4,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond 8900-40G6X-xm         | 1,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond X8 a-series modules   | 1,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | BlackDiamond X8-100G4X modules     | 4,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | E4G-200, E4G-400                   | 1,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X440                        | 448                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X460, X670, X440            | 1,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X460-G2                     | 1,350                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X480                        | 4,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X770                        | 2,000                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summit X670-G2                     | 1,500                |
| <b>IGMPv1/v2 SSM-map entries</b> —maximum number of IGMPv1/v2 SSM mapping entries.                                                                                                                                                                                                                                                                                                                                              | All platforms                      | 500                  |
| <b>IGMPv1/v2 SSM-MAP entries</b> —maximum number of sources per group in IGMPv1/v2 SSM mapping entries.                                                                                                                                                                                                                                                                                                                         | All platforms                      | 50                   |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                            | Product                                              | Limit                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------|
| <b>IGMPv2 subscriber</b> —maximum number of IGMPv2 subscribers per port. <sup>1</sup>                                                                             | BlackDiamond 8800 c-series                           | 2,000                        |
|                                                                                                                                                                   | BlackDiamond 8900 c-series                           | 2,000                        |
|                                                                                                                                                                   | BlackDiamond X8 series                               | 2,000                        |
|                                                                                                                                                                   | Summit X430, X460, E4G-200, E4G-400, X440            | 1,000                        |
|                                                                                                                                                                   | Summit X480, X670, X670v-48t                         | 2,000                        |
|                                                                                                                                                                   | Summit X770, X670-G2, X460-G2                        | 4,000                        |
| <b>IGMPv2 subscriber</b> —maximum number of IGMPv2 subscribers per switch. <sup>1</sup>                                                                           | BlackDiamond 8800 c-series                           | 20,000                       |
|                                                                                                                                                                   | BlackDiamond 8900 c-series                           | 20,000                       |
|                                                                                                                                                                   | BlackDiamond X8 series                               | 20,000                       |
|                                                                                                                                                                   | Summit X430, X440, E4G-200                           | 10,000                       |
|                                                                                                                                                                   | Summit X460, X460-G2, X480, X670, E4G-400, X670v-48t | 20,000                       |
|                                                                                                                                                                   | Summit X770, X670-G2                                 | 30,000                       |
| <b>IGMPv3 maximum source per group</b> —maximum number of source addresses per group.                                                                             | All platforms                                        | 250                          |
| <b>IGMPv3 subscriber</b> —maximum number of IGMPv3 subscribers per port. <sup>1</sup>                                                                             | BlackDiamond 8800 e-series                           | 1,000                        |
|                                                                                                                                                                   | BlackDiamond 8800 c-series                           | 2,000                        |
|                                                                                                                                                                   | BlackDiamond 8900 series                             | 5,000                        |
|                                                                                                                                                                   | BlackDiamond X8 series                               | 3,000                        |
|                                                                                                                                                                   | Summit X480, X670, X670v-48t, E4G-200, X440          | 1,000                        |
|                                                                                                                                                                   | Summit X770, X670-G2, X460-G2                        | 4,000                        |
| <b>IGMPv3 subscriber</b> —maximum number of IGMPv3 subscribers per switch. <sup>1</sup>                                                                           | Summit X460, E4G-400                                 | 2,000                        |
|                                                                                                                                                                   | BlackDiamond 8800 e-series                           | 10,000                       |
|                                                                                                                                                                   | BlackDiamond 8800 c-series                           | 20,000                       |
|                                                                                                                                                                   | BlackDiamond 8900 series                             | 30,000                       |
|                                                                                                                                                                   | BlackDiamond X8 series                               | 30,000                       |
|                                                                                                                                                                   | Summit X670, X670v-48t, X480, E4G-200, X440          | 10,000                       |
|                                                                                                                                                                   | Summit X460, E4G-400                                 | 20,000                       |
|                                                                                                                                                                   | Summit X770, X670-G2                                 | 30,000                       |
| <b>IP ARP entries in software</b> —maximum number of IP ARP entries in software.<br><b>NOTE:</b> May be limited by hardware capacity of FDB (maximum L2 entries). | Summit X460-G2                                       | 24,000                       |
|                                                                                                                                                                   | Summit X770                                          | 131,072 (up to) <sup>1</sup> |
|                                                                                                                                                                   | BlackDiamond X8-100G4X modules                       | 229,374 (up to) <sup>1</sup> |
|                                                                                                                                                                   | Summit X670-G2                                       | 131,072                      |
|                                                                                                                                                                   | Summit X670, X480, X460, X440, X430                  | 20,480                       |
|                                                                                                                                                                   | Summit X460-G2                                       | 57,344 (up to) <sup>1</sup>  |
|                                                                                                                                                                   | E4G-200, E4G-400                                     | 20,480                       |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                         | Product                                                                                   | Limit                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------|
| <b>IP ARP entries in software with distributed mode on</b> —maximum number of IP ARP entries in software with distributed mode on.                                                                                                                                                             | BlackDiamond 8000 series with 8900-MSM128 or MSM-48c, and only 8900 xl-series I/O modules | 260,000                     |
|                                                                                                                                                                                                                                                                                                | BlackDiamond 8000 series with any I/O modules that are not 8900 xl-series                 | 100,000                     |
|                                                                                                                                                                                                                                                                                                | BlackDiamond X8 series                                                                    | 28,000                      |
|                                                                                                                                                                                                                                                                                                | All other platforms                                                                       | N/A                         |
| <b>IPv4 ARP entries in hardware with distributed mode on</b> —maximum number of IP ARP entries in hardware with distributed mode on                                                                                                                                                            | Per BlackDiamond 8900-10G8X-xl, up to 260,000 per system                                  | 32,500 <sup>b</sup>         |
|                                                                                                                                                                                                                                                                                                | Per BlackDiamond 8900-G48X-xl or 8900-G48T-xl, up to 130,000 per system                   | 16,250 <sup>b</sup>         |
|                                                                                                                                                                                                                                                                                                | Per BlackDiamond 8000 c-series, up to 18,000 per system                                   | 8,000                       |
|                                                                                                                                                                                                                                                                                                | BlackDiamond 8900-40G6X-xm, up to 22,000 per system                                       | 8,000                       |
|                                                                                                                                                                                                                                                                                                | BlackDiamond X8 series, up to 28,000 per system                                           | 12,000                      |
|                                                                                                                                                                                                                                                                                                | All other platforms                                                                       | N/A                         |
| <b>IPv4 ARP entries in hardware with minimum LPM routes</b> —maximum recommended number of IPv4 ARP entries in hardware, with minimum LPM routes present. For BlackDiamond 8800, BlackDiamond X8, E4G, and Summit series switches, assumes number of IP route reserved entries is 100 or less. | BlackDiamond 8800 c-, xm-series                                                           | 8,000                       |
|                                                                                                                                                                                                                                                                                                | BlackDiamond 8000 e-series                                                                | 1,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                | BlackDiamond 8900 xl-series                                                               | 16,000                      |
|                                                                                                                                                                                                                                                                                                | BlackDiamond X8 a-series                                                                  | 16,000                      |
|                                                                                                                                                                                                                                                                                                | BlackDiamond X8-100G4X modules                                                            | 182,000(up to) <sup>i</sup> |
|                                                                                                                                                                                                                                                                                                | E4G-200                                                                                   | 8,000                       |
|                                                                                                                                                                                                                                                                                                | E4G-400                                                                                   | 16,000                      |
|                                                                                                                                                                                                                                                                                                | Summit X440                                                                               | 412                         |
|                                                                                                                                                                                                                                                                                                | Summit X670, X480 VIM3-40G4X                                                              | 8,000                       |
|                                                                                                                                                                                                                                                                                                | Summit X460, X480                                                                         | 16,000                      |
|                                                                                                                                                                                                                                                                                                | Summit X460-G2                                                                            | 50,000 (up to) <sup>i</sup> |
|                                                                                                                                                                                                                                                                                                | Summit X770, X670-G2                                                                      | 108,000(up to) <sup>i</sup> |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                            | Product                             | Limit                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|
| <b>IPv4 ARP entries in hardware with maximum LPM routes</b> —maximum recommended number of IPv4 ARP entries in hardware, with maximum LPM routes present. For BlackDiamond 8800, BlackDiamond X8, E4G, and Summit series, assumes number of IP route reserved entries is “maximum.”                                                                               | BlackDiamond 8800 c-, xm-series     | 6,000 <sup>g</sup>           |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8000 e-series          | 500 <sup>g</sup>             |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8900 xl-series         | 12,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond X8 a-series            | 12,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond X8-100G4X modules      | 172,000 (up to) <sup>i</sup> |
|                                                                                                                                                                                                                                                                                                                                                                   | E4G-200                             | 6,000 <sup>g</sup>           |
|                                                                                                                                                                                                                                                                                                                                                                   | E4G-400                             | 12,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X440                         | 380                          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X460, X480                   | 12,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X670, X480 VIM3-40G4X        | 6,000 <sup>g</sup>           |
| <b>IP flow information export (IPFIX)</b> —number of simultaneous flows.                                                                                                                                                                                                                                                                                          | Summit X770, X670-G2                | 98,000 (up to) <sup>i</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X460-G2                      | 43,000 (up to) <sup>i</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8900 xl-series modules | 4,096 ingress, 4,096 egress  |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8900 c-series modules  | 4,096 ingress, 4,096 egress  |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond X8-100G4X modules      | 2,048 ingress, 2,048 egress  |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X460-24t/x/p, X460-G2        | 2,048 ingress, 2,048 egress  |
| <b>IPv4 remote hosts in hardware with zero LPM routes</b> —maximum recommended number of IPv4 remote hosts (hosts reachable through a gateway) in hardware when LPM routing is not used. For BlackDiamond 8800, BlackDiamond X8, E4G, and Summit series, assumes number of IP route reserved entries is 0, and number of IPv4 ARP entries present is 100 or less. | Summit X480, X460-48t/x/p           | 4,096 ingress, 4,096 egress  |
|                                                                                                                                                                                                                                                                                                                                                                   | E4G-400                             | 2,048 ingress, 2,048 egress  |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8800 c-series          | 18,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8000 e-series          | 1,000 <sup>g</sup>           |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8900 xl-series         | 40,000 <sup>b</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond 8900-40G6X-xm          | 22,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond X8 a-series            | 28,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | BlackDiamond X8-100G4X modules      | 311,000 (up to) <sup>i</sup> |
|                                                                                                                                                                                                                                                                                                                                                                   | E4G-200                             | 18,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | E4G-400                             | 20,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X440                         | 448                          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X460                         | 20,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X460-G2                      | 73,000 <sup>i</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X480                         | 40,000 <sup>b</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X670, X480 VIM3-40G4X        | 22,000 <sup>g</sup>          |
|                                                                                                                                                                                                                                                                                                                                                                   | Summit X770, X670-G2                | 176,000 (up to) <sup>i</sup> |

Table 2: Supported Limits (Continued)

| Metric                                                                                                        | Product                                                 | Limit                          |
|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|
| <b>IPv4 routes</b> —maximum number of IPv4 routes in software (combination of unicast and multi-cast routes). | BlackDiamond 8900 xl-series with 8900-MSM128 or MSM-48c | 524,256 (up to) <sup>b</sup>   |
|                                                                                                               | All other BlackDiamond 8000 series hardware             | 25,000                         |
|                                                                                                               | BlackDiamond X8 series                                  | 25,000                         |
|                                                                                                               | Summit X440                                             | 256                            |
|                                                                                                               | Summit X460, X670, X770, X670-G2, X460-G2               |                                |
|                                                                                                               | SummitStack or standalone                               | 25,000                         |
|                                                                                                               | Summit X480<br>SummitStack or standalone                | 524,256 (up to) <sup>b</sup>   |
|                                                                                                               | E4G-200, E4G-400                                        | 25,000                         |
| <b>IPv4 routes (LPM entries in hardware)</b> — number of IPv4 routes in hardware.                             | BlackDiamond 8800 c-series                              | 12,000                         |
|                                                                                                               | BlackDiamond 8000 e-series                              | 480                            |
|                                                                                                               | BlackDiamond 8900 xl-series                             | 524,256 (up to) <sup>b j</sup> |
|                                                                                                               | BlackDiamond 8900-40G6X-xm                              | 16,000 <sup>e</sup>            |
|                                                                                                               | BlackDiamond X8 series                                  | 16,000 <sup>e</sup>            |
|                                                                                                               | E4G-200, E4G-400                                        | 12,000                         |
|                                                                                                               | Summit X440                                             | 32                             |
|                                                                                                               | Summit X460, X460-G2                                    | 12,000                         |
|                                                                                                               | Summit X480                                             | 524,256 (up to) <sup>b j</sup> |
|                                                                                                               | Summit X480 VIM3-40G4X                                  | 16,000 <sup>i</sup>            |
|                                                                                                               | Summit X670                                             | 12,000                         |
|                                                                                                               | Summit X770, X670-G2                                    | 16,000                         |
| <b>IPv6 addresses on an interface</b> — maximum number of IPv6 addresses on an interface.                     | All platforms                                           | 255                            |
| <b>IPv6 addresses on a switch</b> — maximum number of IPv6 addresses on a switch                              | BlackDiamond 8000 series                                | 512                            |
|                                                                                                               | BlackDiamond X8 series                                  | 2,048                          |
|                                                                                                               | E4G-200, E4G-400                                        | 512                            |
|                                                                                                               | Summit X440                                             | 254                            |
|                                                                                                               | Summit X460, X480                                       | 512                            |
|                                                                                                               | Summit X770, X670, X670-G2, X460-G2                     | 2,048                          |

Table 2: Supported Limits (Continued)

| Metric                                                                                                               | Product                                                          | Limit                        |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------|
| <b>IPv6 host entries in hardware</b> —maximum number of IPv6 neighbor entries in hardware.                           | BlackDiamond 8800 c-, xm-series                                  | 3,000 <sup>g</sup>           |
|                                                                                                                      | BlackDiamond 8000 e-series                                       | 250 <sup>g</sup>             |
|                                                                                                                      | BlackDiamond 8900-10G24X-c modules                               | 2,000 <sup>g</sup>           |
|                                                                                                                      | BlackDiamond 8900-G96T-c modules                                 | 4,000 <sup>g</sup>           |
|                                                                                                                      | BlackDiamond 8900 xl-series                                      | 8,192 (up to) <sup>b g</sup> |
|                                                                                                                      | BlackDiamond X8 a-series                                         | 3,000 <sup>g</sup>           |
|                                                                                                                      | BlackDiamond X8-100G4X modules                                   | 49,000 <sup>g</sup>          |
|                                                                                                                      | E4G-200                                                          | 2,000 <sup>g</sup>           |
|                                                                                                                      | E4G-400                                                          | 3,000 <sup>g</sup>           |
|                                                                                                                      | Summit X440                                                      | 192 <sup>g</sup>             |
|                                                                                                                      | Summit X460, X670, X480 VIM3-40G4X                               | 3,000 <sup>g</sup>           |
|                                                                                                                      | Summit X770, X670-G2                                             | 36,750 <sup>g</sup>          |
|                                                                                                                      | Summit X480, X670v-48t                                           | 6,000 <sup>g</sup>           |
|                                                                                                                      | Summit X460-G2                                                   | 22,000 <sup>g</sup>          |
| <b>IPv6 routes (LPM entries in hardware)</b> —maximum number of IPv6 routes in hardware.                             | BlackDiamond 8800 c-series                                       | 6,000                        |
|                                                                                                                      | BlackDiamond 8000 e-series                                       | 240                          |
|                                                                                                                      | BlackDiamond 8900 xm-series                                      | 8,000                        |
|                                                                                                                      | BlackDiamond 8900 xl-series                                      | 245,760 (up to) <sup>b</sup> |
|                                                                                                                      | BlackDiamond X8 series                                           | 8,000                        |
|                                                                                                                      | E4G-200, E4G-400                                                 | 6,000                        |
|                                                                                                                      | Summit X440                                                      | 16                           |
|                                                                                                                      | Summit X460, X460-G2                                             | 6,000                        |
|                                                                                                                      | Summit X670, X480 VIM3-40G4X, X670, X670-G2, X770                | 8,000                        |
|                                                                                                                      | Summit X480                                                      | 245,760 (up to) <sup>b</sup> |
| <b>IPv6 routes with a mask greater than 64 bits in hardware</b> —maximum number of such IPv6 LPM routes in hardware. | BlackDiamond 8000 c-, e-, xm-series                              | 256                          |
|                                                                                                                      | BlackDiamond 8000 xl-series                                      | 245,760 (up to) <sup>b</sup> |
|                                                                                                                      | BlackDiamond X8 series                                           | 256                          |
|                                                                                                                      | E4G-200, E4G-400                                                 | 256                          |
|                                                                                                                      | Summit X440, X460, X460-G2, X670, X670-G2, X770, X480 VIM3-40G4X | 256                          |
|                                                                                                                      | Summit X480                                                      | 245,760 (up to) <sup>b</sup> |
|                                                                                                                      |                                                                  |                              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Product                                                                                      | Limit                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------|
| <b>IPv6 routes in software</b> —maximum number of IPv6 routes in software.                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900 xl-series with 8900-MSM128 or MSM-48c                                      | 245,760 (up to) <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | All other BlackDiamond 8000 series hardware                                                  | 25,000                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BlackDiamond X8 series                                                                       | 25,000                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X460, X460-G2, X670, X670-G2, X770, X48, E4G-200, E4G-400, SummitStack, or standalone | 25,000                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X440                                                                                  | 256                          |
| <b>IP router interfaces</b> —maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.                                                                                                                                                                                                                                                                                                                                                                                                       | Summit X460-G2, X670, X770, X670-G2, and BlackDiamond X8                                     | 2,048                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X440                                                                                  | 254                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X480, X460                                                                            | 512                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | E4G-200, E4G-400                                                                             | 512                          |
| <b>IP multi-cast static routes</b> —maximum number of permanent multi-cast IP routes.                                                                                                                                                                                                                                                                                                                                                                                                                               | All platforms (except Summit X440)                                                           | 1,024                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X440                                                                                  | 32                           |
| <b>IP unicast static routes</b> —maximum number of permanent IP unicast routes.                                                                                                                                                                                                                                                                                                                                                                                                                                     | All platforms (except Summit X440)                                                           | 1,024                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X440                                                                                  | 32                           |
| <b>IP route sharing (maximum gateways)</b> —Configurable maximum number of gateways used by equal cost multipath OSPF, BGP, IS-IS, static routes, or L2VPNs. Routing protocol OSPF is limited to 16 ECMP gateways per destination. Routing protocols BGP and IS-IS are limited to 8 ECMP gateways per destination. Static routes are limited to 32 next-hops. 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. | All platforms, except Summit X670 and BlackDiamond X8                                        | 2, 4, 8, 16, or 32           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summit X670, BlackDiamond X8                                                                 | 2, 4, 6, 8, 16, 32, or 64    |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product                                                                                                                                                                      | Limit                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>IP route sharing (total destinations)</b> —maximum number of unique destinations used by multipath OSPF, OSPFv3, BGP, IS-IS, or static routes.<br><br><b>NOTE:</b> For platforms with limit of 524,256, the total number of "destination+gateway" pairs is limited to 1,048,512. For example, if the number of unique destinations is 524,256, only 2 gateways per destination is supported.<br><br>For other platforms, each limit is based on up to 8 gateways per destination for BGP and IS-IS routing protocols, up to 16 gateways per destination for OSPF, or up to 32 gateways per destination for static routes. | BlackDiamond 8800 c-series                                                                                                                                                   | 12,256                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond 8000 e-series                                                                                                                                                   | 480                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond 8900 xl-series                                                                                                                                                  | 524,256 (up to) <sup>b</sup>           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond 8900-40G6X-xm                                                                                                                                                   | 16,352                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond X8 series                                                                                                                                                       | 16,000                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | E4G-200, E4G-400                                                                                                                                                             | 12,256                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summit X480                                                                                                                                                                  | 524,256 (up to) <sup>b</sup>           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summit X670, X670-G2, X770, X480 VIM3-40G4X                                                                                                                                  | 16,352                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summit X460-G2, X460                                                                                                                                                         | 12,256                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                              |                                        |
| <b>IP route sharing (total combinations of gateway sets)</b> —maximum number of combinations of sets of adjacent gateways used by multipath OSPF, BGP, IS-IS, or static routes.                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond 8800 c-, xl-, and xm-series                                                                                                                                     |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | default maximum gateways of 4<br>if maximum gateways is 2<br>if maximum gateways is 8<br>if maximum gateways is 16<br>if maximum gateways is 32                              | 510<br>1,022<br>254<br>126<br>62       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond 8000 e-series                                                                                                                                                   |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | default maximum gateways of 4<br>if maximum gateways is 2<br>if maximum gateways is 8<br>if maximum gateways is 16<br>if maximum gateways is 32                              | 30<br>62<br>14<br>6<br>2               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BlackDiamond X8 series, Summit X670                                                                                                                                          |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | default maximum gateways of 4<br>if maximum gateways is 2<br>if maximum gateways is 8<br>if maximum gateways is 16<br>if maximum gateways is 32<br>if maximum gateways is 64 | 510<br>1,022<br>254<br>126<br>62<br>30 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Summit X460, X460-G2, X480, X670, X670-G2, X770, E4G-200, E4G-400                                                                                                            |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | default maximum gateways of 4<br>if maximum gateways is 2<br>if maximum gateways is 8<br>if maximum gateways is 16<br>if maximum gateways is 32                              | 510<br>1,022<br>254<br>126<br>62       |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                     | Product                                               | Limit      |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------|
| <b>IP multinetting (secondary IP addresses)</b> —maximum number of secondary IP addresses per VLAN.                        | BlackDiamond 8800                                     | 64         |
|                                                                                                                            | BlackDiamond X8                                       | 64         |
|                                                                                                                            | All Summits, except X440, X430                        | 255        |
|                                                                                                                            | Summit X440                                           | 32         |
| <b>IS-IS adjacencies</b> —maximum number of supported IS-IS adjacencies.                                                   | BlackDiamond 8000 series                              | 128        |
|                                                                                                                            | BlackDiamond X8 series                                | 128        |
|                                                                                                                            | BlackDiamond 8900 xl-series                           | 255        |
|                                                                                                                            | Summit X440, X460, X460-G2, X480, X670, X670-G2, X770 | 128        |
|                                                                                                                            | E4G-200                                               | 256        |
|                                                                                                                            | E4G-400                                               | 128        |
| <b>IS-IS ECMP</b> —maximum number of equal cost multipath for IS-IS.                                                       | All platforms, except Summit X440, X430               | 2, 4, or 8 |
| <b>IS-IS interfaces</b> —maximum number of interfaces that can support IS-IS.                                              | All platforms, except Summit X440, x430               | 255        |
| <b>IS-IS routers in an area</b> —recommended maximum number of IS-IS routers in an area.                                   | Summit X480                                           | 128        |
|                                                                                                                            | All other platforms, except Summit X440, X430         | 256        |
| <b>IS-IS route origination</b> —recommended maximum number of routes that can be originated by an IS-IS node.              | BlackDiamond 8000 series                              | 20,000     |
|                                                                                                                            | BlackDiamond X8 series                                | 20,000     |
|                                                                                                                            | BlackDiamond 8900 xl-series                           | 30,000     |
|                                                                                                                            | Summit X460, X460-G2, X670, X670-G2, X770, X480,      | 20,000     |
|                                                                                                                            | E4G-400                                               | 20,000     |
|                                                                                                                            | E4G-200                                               | 25,000     |
| <b>IS-IS IPv4 L1 routes in an L1 router</b> —recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router. | BlackDiamond 8000 series                              | 25,000     |
|                                                                                                                            | BlackDiamond X8 series                                | 25,000     |
|                                                                                                                            | BlackDiamond 8900 xl-series                           | 120,000    |
|                                                                                                                            | Summit X480                                           | 50,000     |
|                                                                                                                            | Summit X440, X460, X460-G2, X670, X670-G2, X770       | 25,000     |
|                                                                                                                            | E4G-200, E4G-400                                      | 25,000     |
| <b>IS-IS IPv4 L2 routes</b> —recommended maximum number of IS-IS Level 2 routes.                                           | BlackDiamond 8000 series                              | 20,000     |
|                                                                                                                            | BlackDiamond X8 series                                | 25,000     |
|                                                                                                                            | BlackDiamond 8900 xl-series                           | 120,000    |
|                                                                                                                            | Summit X480                                           | 50,000     |
|                                                                                                                            | Summit X460, X460-G2, X670, X670-G2, X770             | 25,000     |
|                                                                                                                            | E4G-200, E4G-400                                      | 25,000     |
|                                                                                                                            |                                                       |            |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                   | Product                                            | Limit  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------|
| <b>IS-IS IPv4 L1 routes in an L1/L2 router</b> —recommended maximum number of IS-IS Level 1 routes in an L1/L2 IS-IS router.                                                                             | BlackDiamond 8000 series                           | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond 8900 xl-series                        | 20,000 |
|                                                                                                                                                                                                          | Summit X460, X460-G2, X480, X670, X670-G2, X770    | 20,000 |
|                                                                                                                                                                                                          | E4G-200, E4G-400                                   | 20,000 |
| <b>IS-IS IPv6 L1 routes in an L1 router</b> —recommended maximum number of IS-IS Level 1 routes in a Level 1 IS-IS router.                                                                               | BlackDiamond 8000 series                           | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond 8900 xl-series                        | 40,000 |
|                                                                                                                                                                                                          | Summit X480                                        | 25,000 |
|                                                                                                                                                                                                          | Summit X460, X460-G2, X670, X670-G2, X770, E4G-400 | 10,000 |
| <b>IS-IS IPv6 L2 routes</b> —recommended maximum number of IS-IS Level 2 routes.                                                                                                                         | BlackDiamond 8000 series                           | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond 8900 xl-series                        | 40,000 |
|                                                                                                                                                                                                          | Summit X480                                        | 15,000 |
|                                                                                                                                                                                                          | Summit X460, X460-G2, X670, X670-G2, X770          | 10,000 |
| <b>IS-IS IPv6 L1 routes in an L1/L2 router</b> —recommended maximum number of IS-IS Level 1 routes in a L1/L2 router.                                                                                    | E4G-200, E4G-400                                   | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond 8000 series                           | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond 8900 xl-series                        | 15,000 |
|                                                                                                                                                                                                          | Summit X480                                        | 15,000 |
| <b>IS-IS IPv4/IPv6 L1 routes in an L1 router</b> —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, X460-G2, X670, X670-G2, X770, E4G-400 | 10,000 |
|                                                                                                                                                                                                          | BlackDiamond 8000 series                           | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond 8900 xl-series                        | 60,000 |
|                                                                                                                                                                                                          | Summit X480                                        | 40,000 |
| <b>IS-IS IPv4/IPv6 L2 routes in an L2 router</b> —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, X460-G2, X670, X670-G2, X770          | 20,000 |
|                                                                                                                                                                                                          | E4G-200, E4G-400                                   | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond 8000 series                           | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond 8900 xl-series                        | 60,000 |
| <b>IS-IS IPv4/IPv6 L2 routes in an L2 router</b> —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 X480                                        | 40,000 |
|                                                                                                                                                                                                          | Summit X460, X460-G2, X670, X670-G2, X770          | 20,000 |
|                                                                                                                                                                                                          | E4G-200, E4G-400                                   | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond 8000 series                           | 20,000 |
|                                                                                                                                                                                                          | BlackDiamond X8 series                             | 20,000 |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                             | Product                                                   | Limit   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------|
| <b>IS-IS IPv4/IPv6 L1 routes in an L1/L2 router</b> —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. | BlackDiamond 8000 series                                  | 20,000  |
|                                                                                                                                                                                                                    | BlackDiamond X8 series                                    | 20,000  |
|                                                                                                                                                                                                                    | BlackDiamond 8900 xl-series                               | 20,000  |
|                                                                                                                                                                                                                    | Summit X460, X460-G2, X480, X670, X670-G2, X770           | 20,000  |
|                                                                                                                                                                                                                    | E4G-200, E4G-400                                          | 20,000  |
| <b>Jumbo frames</b> —maximum size supported for jumbo frames, including the CRC.                                                                                                                                   | All platforms                                             | 9,216   |
| <b>L2 VPN: VCCV (pseudowire Virtual Circuit Connectivity Verification) VPNs per switch</b> —maximum number of VCCV enabled VPLS VPNs.                                                                              | All platforms, except Summit X440, X430                   | 16      |
| <b>L2 VPN: VPLS MAC addresses</b> —maximum number of MAC addresses learned by a switch.                                                                                                                            | BlackDiamond 8900 xl-series                               | 512,000 |
|                                                                                                                                                                                                                    | BlackDiamond 8900-40G6X-xm                                | 128,000 |
|                                                                                                                                                                                                                    | BlackDiamond X8 a-series modules                          | 128,000 |
|                                                                                                                                                                                                                    | BlackDiamond X8-100G4X modules                            | 384,000 |
|                                                                                                                                                                                                                    | E4G-200, E4G-400                                          | 32,000  |
|                                                                                                                                                                                                                    | Summit X460                                               | 32,000  |
|                                                                                                                                                                                                                    | Summit X480                                               | 512,000 |
|                                                                                                                                                                                                                    | Summit X670, Summit X670V-48t, Summit X770                | 128,000 |
|                                                                                                                                                                                                                    | Summit X480-40G VIM                                       | 121,000 |
|                                                                                                                                                                                                                    | Summit X670-G2                                            | 140,000 |
| <b>L2 VPN: VPLS VPNs</b> —maximum number of VPLS virtual private networks per switch.                                                                                                                              | Summit X460-G2                                            | 55,000  |
|                                                                                                                                                                                                                    | BlackDiamond 8900 xl-series                               | 1,023   |
|                                                                                                                                                                                                                    | BlackDiamond 8900-40G6x-xm                                | 1,023   |
|                                                                                                                                                                                                                    | BlackDiamond X8 series                                    | 1,023   |
|                                                                                                                                                                                                                    | E4G-200, E4G-400                                          | 1,023   |
|                                                                                                                                                                                                                    | Summit X460, X460-G2, X480, X670, X670V-48t, X480-40G VIM | 1,023   |
|                                                                                                                                                                                                                    | Summit X770, X670-G2                                      | 4,090   |
| <b>L2 VPN: VPLS peers</b> —maximum number of VPLS peers per VPLS instance.                                                                                                                                         | BlackDiamond 8900 xl-series                               | 64      |
|                                                                                                                                                                                                                    | BlackDiamond 8900-40G6x-xm                                | 64      |
|                                                                                                                                                                                                                    | BlackDiamond X8 series                                    | 64      |
|                                                                                                                                                                                                                    | Summit X770, X670-G2, X670v-48t, X480, X460-G2            | 64      |
|                                                                                                                                                                                                                    | Summit X670, X460                                         | 32      |
|                                                                                                                                                                                                                    | E4G-200, E4G-400                                          | 32      |

Table 2: Supported Limits (Continued)

| Metric                                                                                                              | Product                                         | Limit  |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------|
| <b>L2 VPN: LDP pseudowires</b> —<br>maximum number of pseudowires per switch.                                       | BlackDiamond 8900 xl-series                     | 7,000  |
|                                                                                                                     | BlackDiamond 8900-40G6X-xm                      | 3,000  |
|                                                                                                                     | BlackDiamond X8 series                          | 7,000  |
|                                                                                                                     | E4G-200, E4G-400                                | 1,000  |
|                                                                                                                     | Summit X770                                     | 7,800  |
|                                                                                                                     | Summit X670-G2, X670v-48t, X480                 | 7,000  |
|                                                                                                                     | Summit X670                                     | 3,000  |
|                                                                                                                     | Summit X460-G2                                  | 7,116  |
|                                                                                                                     | Summit X460                                     | 1,000  |
| <b>L2 VPN: static pseudowires</b> —<br>maximum number of static pseudowires per switch.                             | BlackDiamond 8900 xl-series,<br>BlackDiamond X8 | 7,116  |
|                                                                                                                     | BlackDiamond 8900-40G6X-xm                      | 3,020  |
|                                                                                                                     | Summit X460, X480, X670V-48t                    | 7,116  |
|                                                                                                                     | Summit X770                                     | 15,308 |
|                                                                                                                     | Summit X480-40G, Summit X670                    | 3,020  |
|                                                                                                                     | Summit X670-G2, X460-G2                         | 7,000  |
|                                                                                                                     | E4G-200                                         | 2,764  |
|                                                                                                                     | E4G-400                                         | 6,860  |
| <b>L2 VPN: Virtual Private Wire Service (VPWS) VPNs</b> —<br>maximum number of virtual private networks per switch. | Summit X460                                     | 1,000  |
|                                                                                                                     | Summit X480, X770                               | 4,000  |
|                                                                                                                     | Summit X480-40G VIM                             | 2,047  |
|                                                                                                                     | Summit X670                                     | 2,047  |
|                                                                                                                     | Summit X670V-48t                                | 4,000  |
|                                                                                                                     | BlackDiamond 8900 xl-series                     | 4,000  |
|                                                                                                                     | BlackDiamond 8900-40G6X-xm                      | 2,047  |
|                                                                                                                     | BlackDiamond X8 series                          | 4,000  |
|                                                                                                                     | Summit X670-G2                                  | 4,090  |
|                                                                                                                     | Summit X460-G2                                  | 1,023  |
|                                                                                                                     | E4G-200, E4G-400                                | 1,000  |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                               | Product                                                | Limit               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------|
| <b>Layer-2 IPMC forwarding caches—</b><br>(IGMP/MLD/PIM snooping) in<br>mac-vlan mode.<br><b>NOTE:</b> IPv6 and IPv4 L2 IPMC<br>scaling is the same for this mode.   | BlackDiamond 8800 e-series switches                    | 2,000               |
|                                                                                                                                                                      | BlackDiamond 8800 c- and xl-series switches            | 8,000               |
|                                                                                                                                                                      | BlackDiamond 8800 xm-series switches                   | 15,000              |
|                                                                                                                                                                      | BlackDiamond X8 series switches                        | 15,000              |
|                                                                                                                                                                      | E4G-200, E4G-400                                       | 10,000              |
|                                                                                                                                                                      | Summit X480                                            | 8,000               |
|                                                                                                                                                                      | Summit X460                                            | 10,000              |
|                                                                                                                                                                      | Summit X670                                            | 15,000              |
|                                                                                                                                                                      | Summit X440, X430                                      | 5,000               |
|                                                                                                                                                                      | Summit X770, X670-G2                                   | 77,500 <sup>i</sup> |
|                                                                                                                                                                      | Summit X460-G2                                         | 24,576              |
| <b>Layer-2 IPMC forwarding caches—</b><br>(IGMP/MLD/PIM snooping) in<br>mixed-mode.<br><b>NOTE:</b> IPv6 and IPv4 L2 IPMC<br>scaling is the same for this mode.      | BlackDiamond 8800 e-series switches                    | N/A                 |
|                                                                                                                                                                      | BlackDiamond 8800 xl- and c-series switches            | 8,000               |
|                                                                                                                                                                      | BlackDiamond 8800 xm-series switches                   | 15,000              |
|                                                                                                                                                                      | BlackDiamond X8, Summit X670                           | 15,000              |
|                                                                                                                                                                      | E4G-200 and E4G-400 cell site routers, Summit X460     | 8,000               |
|                                                                                                                                                                      | Summit X440                                            | 4,000               |
|                                                                                                                                                                      | Summit X770, X670-G2, X670, X480, X460-G2              | 15,000 <sup>i</sup> |
| <b>Layer-3 IPMC forwarding caches—</b><br>(PIM, MVR, PVLAN) in mixed-mode. <sup>9</sup><br><b>NOTE:</b> IPv6 L3 IPMC scaling is 50%<br>of these limits in this mode. | BlackDiamond 8800 e-series switches                    | N/A                 |
|                                                                                                                                                                      | BlackDiamond 8800 xl- and c-series switches            | 6,000               |
|                                                                                                                                                                      | BlackDiamond 8800 xm-series switches                   | 3,000               |
|                                                                                                                                                                      | BlackDiamond X8 a-series modules                       | 6,000               |
|                                                                                                                                                                      | BlackDiamond X8-100G4X modules                         | 64,000              |
|                                                                                                                                                                      | E4G-200 cell site routers, Summit X670                 | 3,000               |
|                                                                                                                                                                      | E4G-400 cell site routers, Summit X460, X480, X670-48t | 6,000               |
|                                                                                                                                                                      | Summit X440                                            | 192                 |
|                                                                                                                                                                      | Summit X770, X670-G2                                   | 77,500 <sup>i</sup> |
|                                                                                                                                                                      | Summit X460-G2                                         | 21,000              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                      | Product                                                                                             | Limit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------|
| <b>Load sharing</b> —maximum number of loadsharing groups.<br><b>NOTE:</b> 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. | BlackDiamond 8000 series without 8900-40G6X-xm                                                      |       |
|                                                                                                                                                                                                                             | With distributed IP ARP mode off (default)                                                          | 128   |
|                                                                                                                                                                                                                             | With distributed IP ARP mode on                                                                     | 64    |
|                                                                                                                                                                                                                             | BlackDiamond 8000 series with 8900-40G6X-xm using address-based custom algorithm                    |       |
|                                                                                                                                                                                                                             | With distributed IP ARP mode off (default)                                                          | 128   |
|                                                                                                                                                                                                                             | With distributed IP ARP mode on                                                                     | 64    |
|                                                                                                                                                                                                                             | BlackDiamond 8000 series with 8900-40G6X-xm with L2, L3 or L3_L4 algorithm configured for any group |       |
|                                                                                                                                                                                                                             | With distributed IP ARP mode off (default)                                                          | 127   |
|                                                                                                                                                                                                                             | With distributed IP ARP mode on                                                                     | 63    |
|                                                                                                                                                                                                                             | SummitStack with X670 with L2, L3 or L3_L4 algorithm configured for any group                       | 127   |
|                                                                                                                                                                                                                             | All other SummitStack configurations and Summit series switches                                     | 128   |
|                                                                                                                                                                                                                             | BlackDiamond X8 series using address-based custom algorithm                                         |       |
|                                                                                                                                                                                                                             | With distributed IP ARP mode off (default)                                                          | 384   |
|                                                                                                                                                                                                                             | With distributed IP ARP mode on                                                                     | 384   |
|                                                                                                                                                                                                                             | BlackDiamond X8 series with L2, L3 or L3_L4 algorithm configured for any group                      |       |
|                                                                                                                                                                                                                             | With distributed IP ARP mode off (default)                                                          | 127   |
|                                                                                                                                                                                                                             | With distributed IP ARP mode on                                                                     | 63    |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                    | Product                                                                                             | Limit         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------|
| <b>Load sharing</b> —maximum number of ports per load-sharing group.<br><b>NOTE:</b><br>* For custom algorithm<br>** For L2 and L3 algorithms<br><b>NOTE:</b> For a mix of Summit X770 and Summit X670 series switches in a stack, the limits are the Summit X670 limits. | BlackDiamond X8 series                                                                              | 64            |
|                                                                                                                                                                                                                                                                           | Summit X460-G2 (standalone)                                                                         | 32            |
|                                                                                                                                                                                                                                                                           | Summit X670 (standalone)                                                                            | 32 *<br>16 ** |
|                                                                                                                                                                                                                                                                           | Summit X670 (stacked)<br>Summit X670-G2 (stacked)                                                   | 64 *<br>16 ** |
|                                                                                                                                                                                                                                                                           | Summit X770 (standalone)<br>Summit X670-G2 (standalone)<br>Summit X460-G2 (standalone)              | 32            |
|                                                                                                                                                                                                                                                                           | Summit X770 (stacked)<br>Summit X670-G2 (stacked)<br>Summit X460-G2 (stacked)                       | 64            |
|                                                                                                                                                                                                                                                                           | All other Summit series, SummitStacks, E4G cell site routers, and BlackDiamond 8000 series switches | 8             |
|                                                                                                                                                                                                                                                                           |                                                                                                     |               |
| <b>Logged messages</b> —maximum number of messages logged locally on the system.                                                                                                                                                                                          | All platforms                                                                                       | 20,000        |
| <b>MAC address learning rate</b> —hardware learning rate                                                                                                                                                                                                                  | E4G-200                                                                                             | 22 msec       |
| <b>MAC-based security</b> —maximum number of MAC-based security policies.                                                                                                                                                                                                 | All platforms                                                                                       | 1,024         |
| <b>Mirroring (filters)</b> —maximum number of mirroring filters.<br><b>NOTE:</b> This is the number of filters across all the active mirroring instances.                                                                                                                 | BlackDiamond 8000 series                                                                            | 128           |
|                                                                                                                                                                                                                                                                           | BlackDiamond X8 series                                                                              | 128           |
|                                                                                                                                                                                                                                                                           | All Summit series                                                                                   | 128           |
|                                                                                                                                                                                                                                                                           | E4G cell site routers                                                                               | 128           |
| <b>Mirroring (monitor port)</b> —maximum number of monitor ports.                                                                                                                                                                                                         | All platforms                                                                                       | 1             |
| <b>Mirroring, one-to-many (filters)</b> —maximum number of one-to-many mirroring filters.<br><b>NOTE:</b> This is the no. of filters across all the active mirroring instances                                                                                            | BlackDiamond 8000 series                                                                            | 128           |
|                                                                                                                                                                                                                                                                           | BlackDiamond X8 series                                                                              | 128           |
|                                                                                                                                                                                                                                                                           | All Summit series                                                                                   | 128           |
|                                                                                                                                                                                                                                                                           | E4G cell site routers                                                                               | 128           |
| <b>Mirroring, one-to-many (monitor port)</b> —maximum number of one-to-many monitor ports.                                                                                                                                                                                | All platforms                                                                                       | 16            |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Product                                                                                                       | Limit                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Maximum mirroring instances</b><br><b>NOTE:</b> Only two or four mirroring instance 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:<br>1 4 ingress<br>2 3 ingress + 1 egress<br>3 2 ingress + 2 egress<br>4 2 (ingress + egress)<br>5 1 (ingress + egress) + 2 ingress<br>6 1 (ingress + egress) + 1 egress + 1 ingress | All platforms                                                                                                 | 16<br>(including default mirroring instance) |
| <b>MLAG ports</b> —maximum number of MLAG ports allowed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8000 series<br>BlackDiamond X8 series<br>All Summit series, except X430<br>E4G cell site routers | 768<br>768<br>768<br>768                     |
| <b>MLAG peers</b> —maximum number of MLAG peers allowed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | All platforms, except Summit X430                                                                             | 2                                            |
| <b>MPLS RSVP-TE interfaces</b> —maximum number of interfaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | All platforms                                                                                                 | 32                                           |
| <b>MPLS RSVP-TE ingress LSPs</b> —maximum number of ingress LSPs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | All platforms                                                                                                 | 2,000                                        |
| <b>MPLS RSVP-TE egress LSPs</b> —maximum number of egress LSPs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | All platforms                                                                                                 | 2,000                                        |
| <b>MPLS RSVP-TE transit LSPs</b> —maximum number of transit LSPs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | All platforms                                                                                                 | 2,000                                        |
| <b>MPLS RSVP-TE paths</b> —maximum number of paths.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | All platforms, except Summit X670-G2<br>Summit X670-G2                                                        | 1,000<br>2,000                               |
| <b>MPLS RSVP-TE profiles</b> —maximum number of profiles.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | All platforms, except Summit X670-G2<br>Summit X670-G2                                                        | 1,000<br>2,000                               |
| <b>MPLS RSVP-TE EROs</b> —maximum number of EROs per path.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | All platforms                                                                                                 | 64                                           |

Table 2: Supported Limits (Continued)

| Metric                                                                                           | Product                                                                    | Limit   |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------|
| <b>MPLS RSVP-TE fast reroute</b> —MPLS RSVP-TE fast reroute (FRR) switching time.                | E4G-200                                                                    | 50 msec |
| <b>MPLS LDP peers</b> —maximum number of MPLS LDP peers per switch.                              | Summit X460, Summit X670                                                   | 32      |
|                                                                                                  | Summit X480, Summit X480-40G VIM, Summit X670V-48t, Summit X770, X670v-48t | 64      |
|                                                                                                  | BlackDiamond 8900 xl-series                                                | 64      |
|                                                                                                  | BlackDiamond 8900-40G6x-xm                                                 | 64      |
|                                                                                                  | BlackDiamond X8 series                                                     | 64      |
|                                                                                                  | Summit X670-G2, X460-G2                                                    | 128     |
|                                                                                                  | E4G-400, E4G-200                                                           | 32      |
| <b>MPLS LDP adjacencies</b> —maximum number of MPLS LDP adjacencies per switch.                  | BlackDiamond 8900 xl-series                                                | 50      |
|                                                                                                  | BlackDiamond 8900-40G6x-xm                                                 | 64      |
|                                                                                                  | BlackDiamond X8 series                                                     | 50      |
|                                                                                                  | E4G-200, E4G-400                                                           | 50      |
|                                                                                                  | Summit X460, X480, X670, X460-G2                                           | 50      |
|                                                                                                  | Summit X670V-48t, Summit X480-40G VIM, Summit X770, X670-G2                | 64      |
| <b>MPLS LDP ingress LSPs</b> —maximum number of MPLS LSPs that can originate from a switch.      | BlackDiamond 8900 xl-series                                                | 4,000   |
|                                                                                                  | BlackDiamond 8900-40G6X-xm                                                 | 2,048   |
|                                                                                                  | BlackDiamond X8 series                                                     | 2,048   |
|                                                                                                  | E4G-200                                                                    | 2,048   |
|                                                                                                  | E4G-400                                                                    | 4,000   |
|                                                                                                  | Summit X460, X480                                                          | 4,000   |
|                                                                                                  | Summit X670, Summit X670V-48t, Summit X480-40G VIM, Summit X770            | 2,048   |
|                                                                                                  | Summit X670-G2                                                             | 15,308  |
| <b>MPLS LDP-enabled interfaces</b> —maximum number of MPLS LDP configured interfaces per switch. | Summit X460, X670                                                          | 32      |
|                                                                                                  | Summit X480, Summit X480-40G VIM, Summit X670V-48t, Summit X770            | 64      |
|                                                                                                  | Summit X670-G2, X460-G2                                                    | 128     |
|                                                                                                  | BlackDiamond 8900 xl-series                                                | 64      |
|                                                                                                  | BlackDiamond 8900-40G6x-xm                                                 | 64      |
|                                                                                                  | BlackDiamond X8 series                                                     | 64      |
|                                                                                                  | E4G-200, E4G-200                                                           | 32      |

Table 2: Supported Limits (Continued)

| Metric                                                                                          | Product                                              | Limit  |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------|--------|
| <b>MPLS LDP Sessions</b> —maximum number of MPLS LDP sessions.                                  | BlackDiamond 8900 xl-series                          | 64     |
|                                                                                                 | BlackDiamond 8900-40G6x-xm                           | 64     |
|                                                                                                 | BlackDiamond X8 series                               | 64     |
|                                                                                                 | Summit X770, X670v-48t, X480                         | 64     |
|                                                                                                 | Summit X670-G2, X460-G2                              | 128    |
|                                                                                                 | Summit X670, X460                                    | 32     |
|                                                                                                 | E4G-200, E4G-400                                     | 32     |
| <b>MPLS LDP transit LSPs</b> —maximum number of MPLS transit LSPs per switch.                   | BlackDiamond 8900 xl-series                          | 4,000  |
|                                                                                                 | BlackDiamond 8900-40G6X-xm                           | 3,000  |
|                                                                                                 | BlackDiamond X8 series                               | 4,000  |
|                                                                                                 | E4G-200                                              | 2,700  |
|                                                                                                 | E4G-400                                              | 4,000  |
|                                                                                                 | Summit X460, X480, X770, X670V-48t, X670-G2, X460-G2 | 4,000  |
|                                                                                                 | Summit X670, X480-40G                                | 3,000  |
| <b>MPLS LDP egress LSPs</b> —maximum number of MPLS egress LSPs that can terminate on a switch. | BlackDiamond 8900 xl-series                          | 7,000  |
|                                                                                                 | BlackDiamond 8900-40G6X-xm                           | 3,000  |
|                                                                                                 | BlackDiamond X8 series                               | 7,000  |
|                                                                                                 | E4G-200                                              | 2,700  |
|                                                                                                 | E4G-400                                              | 6,700  |
|                                                                                                 | Summit X460, X480, Summit X670V-48t                  | 7,000  |
|                                                                                                 | Summit X670, Summit x480-40G VIM                     | 3,000  |
|                                                                                                 | Summit X770                                          | 8,000  |
|                                                                                                 | Summit X670-G2, X460-G2                              | 4,000  |
| <b>MPLS static egress LSPs</b> —maximum number of static egress LSPs.                           | BlackDiamond 8900 xl-series, BlackDiamond X8         | 7,116  |
|                                                                                                 | BlackDiamond 8900-40G                                | 3,020  |
|                                                                                                 | Summit X460, X480, X670V-48t, X460-G2                | 7,116  |
|                                                                                                 | Summit X480-40G, X670                                | 3,020  |
|                                                                                                 | Summit X770                                          | 8,000  |
|                                                                                                 | Summit X670-G2                                       | 15,308 |
|                                                                                                 | E4G-200                                              | 2,700  |
|                                                                                                 | E4G-400                                              | 6,860  |

Table 2: Supported Limits (Continued)

| Metric                                                                  | Product                                              | Limit  |
|-------------------------------------------------------------------------|------------------------------------------------------|--------|
| <b>MPLS static ingress LSPs</b> —maximum number of static ingress LSPs. | BlackDiamond 8900 xl-series                          | 4,000  |
|                                                                         | BlackDiamond 8900-40G                                | 2,048  |
|                                                                         | BlackDiamond X8                                      | 2,048  |
|                                                                         | Summit X460, X480, X460-G2                           | 4,000  |
|                                                                         | Summit x480-40G, X670, x670V-48t, X770, X670-G2      | 2,048  |
|                                                                         | E4G-200                                              | 2,048  |
|                                                                         | E4G-400                                              | 4,000  |
| <b>MPLS static transit LSPs</b> —maximum number of static transit LSPs  | BlackDiamond 8900 xl-series                          | 4,000  |
|                                                                         | BlackDiamond 8900-40G                                | 3,000  |
|                                                                         | BlackDiamond X8                                      | 4,000  |
|                                                                         | Summit X460, X480, X670V-48t, X770, X670-G2, X460-G2 | 4,000  |
|                                                                         | Summit X480-40G, X670                                | 3,000  |
|                                                                         | E4G-200                                              | 2,700  |
|                                                                         | E4G-400                                              | 4,000  |
| <b>MSDP active peers</b> —maximum number of active MSDP peers.          | BlackDiamond 8000 series                             | 32     |
|                                                                         | BlackDiamond X8 series                               | 64     |
|                                                                         | BlackDiamond 8900 series                             | 64     |
|                                                                         | Summit X460, X480, X670, E4G-400, X670-G2, X460-G2   | 16     |
|                                                                         | Summit X770                                          | 64     |
| <b>MSDP SA cache entries</b> —maximum number of entries in SA cache.    | BlackDiamond 8000 series                             | 16,000 |
|                                                                         | BlackDiamond X8 series                               | 16,000 |
|                                                                         | BlackDiamond 8900 series                             | 16,000 |
|                                                                         | Summit X460, X480, X670, E4G-400                     | 8,000  |
|                                                                         | Summit X770                                          | 16,000 |
| <b>MSDP maximum mesh groups</b> —maximum number of MSDP mesh groups.    | Summit X670-G2, X460-G2                              | 14,000 |
|                                                                         | BlackDiamond 8000 series                             | 8      |
|                                                                         | BlackDiamond X8 series                               | 16     |
|                                                                         | BlackDiamond 8900 series                             | 16     |
|                                                                         | Summit X460, X480, X670, E4G-400, X460-G2            | 4      |
|                                                                         | Summit X770, X670-G2                                 | 16     |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Product                                   | Limit  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------|
| <b>Multi-cast listener discovery (MLD) IPv6 multi-cast data sender</b> —maximum number of IPv6 multi-cast streams supported on a switch <sup>k, g</sup><br><b>NOTE:</b> Assumes source-group-vlan mode.<br>For additional limits, see: <ul style="list-style-type: none"> <li>Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. on page 46</li> <li>Layer-2 IPMC forwarding caches— (IGMP/MLD/ PIM snooping) in mixed-mode. on page 46</li> </ul> | BlackDiamond 8800 c-series                | 1,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8800 e-series                | 250    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900 c-series                | 1,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900-40G6X-xm                | 1,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900 xl-series               | 3,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond X8 series                    | 3,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | E4G-200                                   | 1,500  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | E4G-400                                   | 3,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X440                               | 90     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X460                               | 3,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X480                               | 3,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X670                               | 1,500  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X770                               | 4,096  |
| <b>Multi-cast listener discovery (MLD) snooping per-VLAN filters</b> —maximum number of VLANs supported in per-VLAN MLD snooping mode.                                                                                                                                                                                                                                                                                                                                   | BlackDiamond e-series                     | 250    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8800 c-series                | 1,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900 c-series                | 500    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900 xl-series               | 2,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond 8900-40G6X-xm                | 500    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond X8 series                    | 500    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | E4G-400, Summit X460, X460-G2             | 1,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X480                               | 2,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X440                               | 250    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X670, E4G-200                      | 500    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X770                               | 1,200  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X670-G2                            | 826    |
| <b>Multi-cast listener discovery (MLD)v1 subscribers</b> —maximum number of MLDv1 subscribers per port <sup>l</sup>                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8800 c-series                | 500    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond xl-series                    | 1,500  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond X8 Series                    | 1,500  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X440, SummitStack                  | 750    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X460, X460-G2, X480, X670, E4G-400 | 1,500  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X770, X670-G2                      | 4,000  |
| <b>Multi-cast listener discovery (MLD)v1 subscribers</b> —maximum number of MLDv1 subscribers per switch <sup>l</sup>                                                                                                                                                                                                                                                                                                                                                    | BlackDiamond 8800 series                  | 10,000 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BlackDiamond X8 series                    | 10,000 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X440, SummitStack                  | 5,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X460, X480, X670, E4G-400, X460-G2 | 10,000 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Summit X770, X670-G2                      | 30,000 |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                    | Product                                   | Limit              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------|
| <b>Multi-cast listener discovery (MLD)v2 subscribers</b> —maximum number of MLDv2 subscribers per port <sup>i</sup>                                                       | BlackDiamond 8800 c-series                | 500                |
|                                                                                                                                                                           | BlackDiamond xl series                    | 2,500              |
|                                                                                                                                                                           | BlackDiamond X8 series                    | 2,000              |
|                                                                                                                                                                           | Summit X440, SummitStack                  | 1,000              |
|                                                                                                                                                                           | Summit X460, X480, X670, E4G-400, X460-G2 | 2,000              |
|                                                                                                                                                                           | Summit X770, X670-G2                      | 4,000              |
| <b>Multi-cast listener discovery (MLD)v2 subscribers</b> —maximum number of MLDv2 subscribers per switch <sup>i</sup>                                                     | BlackDiamond 8800 series                  | 10,000             |
|                                                                                                                                                                           | BlackDiamond xl series                    | 10,000             |
|                                                                                                                                                                           | Summit X440, SummitStack                  | 5,000              |
|                                                                                                                                                                           | Summit X460, X480, X670, E4G-400, X460-G2 | 10,000             |
|                                                                                                                                                                           | Summit X770, X670-G2                      | 30,000             |
| <b>Multi-cast listener discovery (MLD)v2 maximum source per group</b> —maximum number of source addresses per group                                                       | All platforms, except Summit X430         | 200                |
| <b>Multi-cast VLAN registration (MVR)</b> —maximum number of MVR senders per switch (IP multi-cast compression disabled).<br><b>NOTE:</b> Assumes source-group-vlan mode. | BlackDiamond 8800 c-series                | 2,048 <sup>f</sup> |
|                                                                                                                                                                           | BlackDiamond 8000 e-series                | 500 <sup>g</sup>   |
|                                                                                                                                                                           | BlackDiamond 8900 series                  |                    |
|                                                                                                                                                                           | 8900-10G24X-c modules                     | 2,048 <sup>f</sup> |
|                                                                                                                                                                           | 8900-G96T-c modules                       | 4,096 <sup>f</sup> |
|                                                                                                                                                                           | 8900 xl-series                            | 4,096 <sup>f</sup> |
|                                                                                                                                                                           | 8900-40G6X-xm                             | 3,000 <sup>g</sup> |
|                                                                                                                                                                           | BlackDiamond X8 a-series modules          | 4,096              |
|                                                                                                                                                                           | BlackDiamond X8-100G4X modules            | 16,000             |
|                                                                                                                                                                           | E4G-200                                   | 2,048              |
|                                                                                                                                                                           | E4G-400                                   | 500 <sup>g</sup>   |
|                                                                                                                                                                           | Summit X440                               | 1,024              |
|                                                                                                                                                                           | Summit X480                               | 2,048              |
|                                                                                                                                                                           | Summit X460                               | 2,048              |
|                                                                                                                                                                           | Summit X670                               |                    |
|                                                                                                                                                                           | VIM4-40G4x                                | 3,000 <sup>g</sup> |
|                                                                                                                                                                           | Summit X770, X670-G2                      | 4,096              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                              | Product                                                  | Limit               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------|
| <b>Multi-cast VLAN registration (MVR)</b> —maximum number of MVR senders per switch (IP multi-cast compression enabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.<br>For additional limits, see: <a href="#">Layer-3 IPMC forwarding caches—(PIM, MVR, PVLAN) in mixed-mode.g</a> on page 46 | BlackDiamond 8800 c-series                               | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond 8000 e-series                               | 500 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond 8900 c-series                               | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond 8900 xl-series                              | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond X8 a-series modules                         | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond X8-100G4X modules                           | 64,000              |
|                                                                                                                                                                                                                                                                                                     | 8900-40G6X-xm module                                     | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                     | Summit X440                                              | 192 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                     | Summit X460, E4G-400                                     | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                     | Summit X480                                              | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                     | Summit X670                                              |                     |
|                                                                                                                                                                                                                                                                                                     | VIM4-40G4x                                               | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                     | Summit X770                                              | 6,300               |
|                                                                                                                                                                                                                                                                                                     | Summit X670-G2                                           | 10,000              |
| <b>Network login</b> —maximum number of clients being authenticated on MAC-based VLAN enabled ports.                                                                                                                                                                                                | BlackDiamond 8000 series (clients per module/per system) | 1,024               |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond X8 series                                   | 1,024               |
|                                                                                                                                                                                                                                                                                                     | Summit series                                            | 1,024               |
| <b>Network login</b> —maximum number of dynamic VLANs.                                                                                                                                                                                                                                              | All platforms                                            | 2,000               |
| <b>Network login VLAN VSAs</b> —maximum number of VLANs a client can be authenticated on at any given time.                                                                                                                                                                                         | All platforms                                            | 10                  |
| <b>OSPFv2/v3 ECMP</b> —maximum number of equal cost multipath OSPFv2 and OSPFv3.                                                                                                                                                                                                                    | All platforms, except Summit X440, X430, and E4G-200)    | 16                  |
|                                                                                                                                                                                                                                                                                                     | E4G-200                                                  | 8                   |
| <b>OSPFv2 areas</b> —as an ABR, how many OSPF areas are supported within the same switch.                                                                                                                                                                                                           | All platforms (except X430, X440)                        | 8                   |
| <b>OSPFv2 external routes</b> —recommended maximum number of external routes contained in an OSPF LSDB.                                                                                                                                                                                             | BlackDiamond 8000 series                                 | 20,000              |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond 8900 xl-series                              | 130,000             |
|                                                                                                                                                                                                                                                                                                     | BlackDiamond X8 series                                   | 20,000              |
|                                                                                                                                                                                                                                                                                                     | Summit X460, X670, X770, X670-G2, X460-G2                | 5,000               |
|                                                                                                                                                                                                                                                                                                     | Summit X480                                              | 130,000             |
|                                                                                                                                                                                                                                                                                                     | E4G-400                                                  | 5,000               |
|                                                                                                                                                                                                                                                                                                     | E4G-200                                                  | 5,000               |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                      | Product                                                                                                                               | Limit  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>OSPFv2 inter- or intra-area routes</b> —recommended maximum number of inter- or intra-area routes contained in an OSPF LSDB with one ABR in OSPF domain. | BlackDiamond 8000 series                                                                                                              | 7,000  |
|                                                                                                                                                             | BlackDiamond 8900 xl-series                                                                                                           | 7,000  |
|                                                                                                                                                             | BlackDiamond X8 series                                                                                                                | 7,000  |
|                                                                                                                                                             | Summit X460, X670, X670-G2, X460-G2                                                                                                   | 2,000  |
|                                                                                                                                                             | E4G-400                                                                                                                               | 2,000  |
|                                                                                                                                                             | Summit X480, X770                                                                                                                     | 7,000  |
| <b>OSPFv2 interfaces</b> —recommended maximum number of OSPF interfaces on a switch.                                                                        | <b>NOTE:</b> Active interfaces limit, with Advanced Edge license. (See below for Core license limits.)<br>All platforms (except X430) | 4      |
|                                                                                                                                                             | All platforms (except X430 and X440) with Core license or higher (active interfaces only)                                             | 400    |
| <b>OSPFv2 links</b> —maximum number of links in the router LSA.                                                                                             | All platforms, except Summit X770 and X430                                                                                            | 400    |
|                                                                                                                                                             | Summit X770                                                                                                                           | 419    |
| <b>OSPFv2 neighbors</b> —maximum number of supported OSPF adjacencies.                                                                                      | BlackDiamond 8000 series                                                                                                              | 128    |
|                                                                                                                                                             | BlackDiamond 8900 xl-series                                                                                                           | 255    |
|                                                                                                                                                             | BlackDiamond X8 Series                                                                                                                | 255    |
|                                                                                                                                                             | Summit X460, X670, X770, X440, X670-G2, X460-G2                                                                                       | 128    |
|                                                                                                                                                             | Summit X480                                                                                                                           | 255    |
|                                                                                                                                                             | E4G-400, E4G-200                                                                                                                      | 128    |
| <b>OSPFv2 routers in a single area</b> —recommended maximum number of routers in a single OSPF area.                                                        | BlackDiamond 8000 series                                                                                                              | 100    |
|                                                                                                                                                             | BlackDiamond 8900 xl-series                                                                                                           | 200    |
|                                                                                                                                                             | BlackDiamond X8 series                                                                                                                | 100    |
|                                                                                                                                                             | Summit X460, X670, X770, X670-G2, X460-G2                                                                                             | 50     |
|                                                                                                                                                             | Summit X480                                                                                                                           | 200    |
|                                                                                                                                                             | E4G-400                                                                                                                               | 50     |
| <b>OSPFv2 virtual links</b> —maximum number of supported OSPF virtual links.                                                                                | All platforms (except X430 and X440) with Core license or higher                                                                      | 32     |
| <b>OSPFv3 areas</b> —as an ABR, the maximum number of supported OSPFv3 areas.                                                                               | All platforms (except X430 and X440) with Core license or higher                                                                      | 16     |
| <b>OSPFv3 external routes</b> —recommended maximum number of external routes.                                                                               | BlackDiamond 8000 series                                                                                                              | 10,000 |
|                                                                                                                                                             | BlackDiamond X8 series                                                                                                                | 10,000 |
|                                                                                                                                                             | BlackDiamond 8900 xl-series                                                                                                           | 60,000 |
|                                                                                                                                                             | Summit X460, X670, X770, X670-G2, X460-G2                                                                                             | 10,000 |
|                                                                                                                                                             | Summit X480                                                                                                                           | 60,000 |
|                                                                                                                                                             | E4G-400                                                                                                                               | 10,000 |

Table 2: Supported Limits (Continued)

| Metric                                                                                                | Product                                                                                                                                 | Limit      |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>OSPFv3 inter- or intra-area routes</b> —recommended maximum number of inter- or intra-area routes. | BlackDiamond 8000 series                                                                                                                | 6,000      |
|                                                                                                       | BlackDiamond X8 series                                                                                                                  | 6,000      |
|                                                                                                       | BlackDiamond 8900 xl-series                                                                                                             | 6,000      |
|                                                                                                       | Summit X460, X670, X770, X670-G2, X460-G2                                                                                               | 3,000      |
|                                                                                                       | Summit X480                                                                                                                             | 6,000      |
|                                                                                                       | E4G-400                                                                                                                                 | 3,000      |
| <b>OSPFv3 interfaces</b> —maximum number of OSPFv3 interfaces.                                        | <b>NOTE:</b> Active interfaces only, with Advanced Edge license.<br>(See below for Core license limits.)<br>All platforms (except X430) | 4          |
|                                                                                                       | <b>NOTE:</b> With Core license or higher.<br>(See above for Advanced Edge license limits.)                                              |            |
|                                                                                                       | BlackDiamond 8000 series                                                                                                                | 256        |
|                                                                                                       | BlackDiamond X8 series                                                                                                                  | 256        |
|                                                                                                       | BlackDiamond 8900 xl-series                                                                                                             | 384        |
|                                                                                                       | Summit X460, X670, X770                                                                                                                 | 128        |
|                                                                                                       | Summit X480                                                                                                                             | 384        |
|                                                                                                       | Summit X670-G2, X460-G2<br>E4G-200, E4G-400                                                                                             | 256<br>256 |
| <b>OSPFv3 neighbors</b> —maximum number of OSPFv3 neighbors.                                          | BlackDiamond 8000 series                                                                                                                | 64         |
|                                                                                                       | BlackDiamond X8 series                                                                                                                  | 64         |
|                                                                                                       | BlackDiamond 8900 xl-series                                                                                                             | 128        |
|                                                                                                       | Summit X460, X670, X770, X670-G2, X460-G2                                                                                               | 64         |
|                                                                                                       | Summit X480                                                                                                                             | 128        |
|                                                                                                       | E4G-400                                                                                                                                 | 64         |
| <b>OSPFv3 virtual links</b> —maximum number of OSPFv3 virtual links supported.                        | All platforms (except X430 and X440) with Core license or higher                                                                        | 16         |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                                                                                                                    | Product                          | Limit               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------|
| <b>PIM IPv4 snooping</b> —maximum number of (S,G) entries programmed in the hardware (IP multi-cast compression disabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.                                                                                                                                                                                                                                                                | BlackDiamond 8800 c-series       | 2,048 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond 8000 e-series       | 500 <sup>f</sup>    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond 8900 series         |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8900-10G24X-c modules            | 2,048 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8900-G96T-c modules              | 4,096 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8900 xl-series                   | 4,096 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8900-40G6X-xm                    | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond X8 a-series modules | 4,096               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond X8-100G4X modules   | 16,384              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | E4G-200                          | 2,048               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | E4G-400                          | 2,048               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X440                      | 64                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X460, X460-G2             | 2,048               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X480                      | 4,096               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X670                      |                     |
| <b>PIM IPv4 snooping</b> —maximum number of (S,G) entries programmed in the hardware (IP multi-cast compression enabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.<br>For additional limits, see: <ul style="list-style-type: none"> <li>Layer-2 IPMC forwarding caches—(IGMP/MLD/PIM snooping) in mac-vlan mode. on page 46</li> <li>Layer-2 IPMC forwarding caches— (IGMP/MLD/PIM snooping) in mixed-mode. on page 46</li> </ul> | VIM4-40G4x                       | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X670-G2                   | 3,000               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X770                      | 4,096               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond 8800 c-series       | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond 8000 e-series       | 500 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond 8900 c-series       | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond 8900 xl-series      | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond X8 a-series modules | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | BlackDiamond X8-100G4X modules   | 64,000 <sup>g</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | E4G-200                          | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | E4G-400                          | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8900-40G6X-xm                    | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X440                      | 192 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X480                      | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X460, X670-G2, X460-G2    | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X670                      |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | VIM4-40G4x                       | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Summit X770                      | 66,500              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                             | Product                          | Limit               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------|
| <b>PIM IPv4—maximum routes—</b><br>maximum number of (S,G) entries installed in the hardware (IP multi-cast compression disabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.                                                                                                                                 | BlackDiamond 8800 c-series       | 2,048 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond 8000 e-series       | 500 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond 8900 series         |                     |
|                                                                                                                                                                                                                                                                                                                    | 8900-10G24X-c modules            | 2,048 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                    | 8900-G96T-c modules              | 4,096 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                    | 8900 xl-series                   | 4,096 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                    | 8900-40G6X-xm                    | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond X8 a-series modules | 4,094               |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond X8-100G4X modules   | 16,384              |
|                                                                                                                                                                                                                                                                                                                    | E4G-200                          | 2,048               |
|                                                                                                                                                                                                                                                                                                                    | E4G-400                          | 2,048               |
|                                                                                                                                                                                                                                                                                                                    | Summit X440                      | 64 <sup>g</sup>     |
|                                                                                                                                                                                                                                                                                                                    | Summit X480, X670-G2, X460-G2    | 4,096               |
|                                                                                                                                                                                                                                                                                                                    | Summit X460                      | 2,048               |
|                                                                                                                                                                                                                                                                                                                    | Summit X670                      |                     |
| <b>PIM IPv4—maximum routes—</b><br>maximum number of (S,G) entries installed in the hardware (IP multi-cast compression enabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.<br>For additional limits, see:<br><a href="#">Layer-3 IPMC forwarding caches—(PIM, MVR, PVLAN) in mixed-mode.g</a><br>on page 46 | BlackDiamond 8800 c-series       | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond 8000 e-series       | 500 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond 8900 c-series       | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond 8900 xl-series      | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond X8 a-series modules | 6,000 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                    | BlackDiamond X8-100G4X           | 64,000 <sup>f</sup> |
|                                                                                                                                                                                                                                                                                                                    | E4G-200                          | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | E4G-400                          | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | 8900-40G6X-xm modules            | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | Summit X440                      | 192                 |
|                                                                                                                                                                                                                                                                                                                    | Summit X480                      | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                    | Summit X460                      | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | Summit X670                      |                     |
|                                                                                                                                                                                                                                                                                                                    | VIM4-40G4x                       | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                    | Summit X770, X670-G2             | 66,500              |
|                                                                                                                                                                                                                                                                                                                    | Summit X460-G2                   | 21,000              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                                                               | Product                          | Limit               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------|
| <b>PIM IPv4-SSM (maximum SSM routes)</b> —maximum number of (S,G) entries installed in the hardware with PIM SSM configuration (IP multi-cast compression disabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.                                                                                                                                 | BlackDiamond 8800 c-series       | 2,048 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8000 e-series       | 500 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8900 series         |                     |
|                                                                                                                                                                                                                                                                                                                                                      | 8900-10G24X-c modules            | 2,048 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | 8900-G96T-c modules              | 4,096 <sup>f</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | 8900 xl-series                   | 15,000              |
|                                                                                                                                                                                                                                                                                                                                                      | 8900-40G6X-xm                    | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond X8 a-series modules | 4,094               |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond X8-100G4X modules   | 16,384              |
|                                                                                                                                                                                                                                                                                                                                                      | E4G-200                          | 2,048               |
|                                                                                                                                                                                                                                                                                                                                                      | E4G-400                          | 2,048               |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X440                      | 64                  |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X480, X670-G2, X460-G2    | 4,096               |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X460                      | 2,048               |
| <b>PIM IPv4-SSM (maximum SSM routes)</b> —maximum number of (S,G) entries installed in the hardware with PIM SSM configuration (IP multi-cast compression enabled).<br><b>NOTE:</b> Assumes source-group-vlan mode.<br>For additional limits, see:<br><a href="#">Layer-3 IPMC forwarding caches—(PIM, MVR, PVLAN) in mixed-mode.g</a><br>on page 46 | Summit X670                      |                     |
|                                                                                                                                                                                                                                                                                                                                                      | VIM4-40G4x                       | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X770                      | 4,096               |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8800 c-series       | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8000 e-series       | 500 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8900 c-series       | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond 8900 xl-series      | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond X8 a-series modules | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | BlackDiamond X8-100G4X modules   | 64,000 <sup>g</sup> |
|                                                                                                                                                                                                                                                                                                                                                      | E4G-200                          | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | E4G-400                          | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | 8900-40G6X-xm                    | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X440                      | 192 <sup>g</sup>    |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X480                      | 12,000 <sup>b</sup> |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X460                      | 6,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X670                      |                     |
|                                                                                                                                                                                                                                                                                                                                                      | VIM4-40G4x                       | 3,000 <sup>g</sup>  |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X770                      | 66,500              |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X670-G2                   | 60,000              |
|                                                                                                                                                                                                                                                                                                                                                      | Summit X460-G2                   | 21,000              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                       | Product                                 | Limit               |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------|
| <b>PIM IPv6 (maximum routes)</b> —maximum number of (S,G) entries installed in the hardware.<br><b>NOTE:</b> Assumes source-group-vlan mode. | BlackDiamond 8800 c-series              | 1,000               |
|                                                                                                                                              | BlackDiamond 8800 e-series              | 250                 |
|                                                                                                                                              | BlackDiamond 8900 c-series              | 1,000               |
|                                                                                                                                              | BlackDiamond 8900-40G6X-xm              | 1,000               |
|                                                                                                                                              | BlackDiamond 8900 xl-series             | 3,000               |
|                                                                                                                                              | BlackDiamond X8 a-series modules        | 3,000               |
|                                                                                                                                              | BlackDiamond X8-100G4X modules          | 64,000 <sup>d</sup> |
|                                                                                                                                              | E4G-200                                 | 1,500               |
|                                                                                                                                              | E4G-400                                 | 3,000               |
|                                                                                                                                              | Summit X440                             | 90                  |
|                                                                                                                                              | Summit X460, X460-G2, X480              | 3,000               |
|                                                                                                                                              | Summit X670                             | 1,500               |
|                                                                                                                                              | Summit X770, X670-G2                    | 38,000              |
| <b>PIM IPv4 (maximum interfaces)</b> —maximum number of PIM active interfaces.                                                               | All platforms, except Summit X430, X440 | 512                 |
| <b>PIM IPv4 (maximum interfaces)</b> —maximum number of PIM snooping enabled interfaces.                                                     | All platforms, except Summit X430, X440 | 512                 |
| <b>PIM IPv4 Limits</b> —maximum number of multi-cast groups per rendezvous point                                                             | All platforms, except Summit X430, X440 | 180                 |
| <b>PIM IPv4 Limits</b> —maximum number of multi-cast sources per group                                                                       | All platforms, except Summit X430, X440 | 175                 |
| <b>PIM IPv4 Limits</b> —maximum number of dynamic rendezvous points per multi-cast group                                                     | All platforms, except Summit X430, X440 | 145                 |
| <b>PIM IPv4 Limits</b> —static rendezvous points                                                                                             | All platforms, except Summit X430, X440 | 32                  |
| <b>PIM IPv6 (maximum interfaces)</b> —maximum number of PIM active interfaces                                                                | All platforms, except Summit X430, X440 | 512                 |
| <b>PIM IPv6 Limits</b> —maximum number of multicast group per rendezvous point                                                               | All platforms, except Summit X430, X440 | 70                  |
| <b>PIM IPv6 Limits</b> —maximum number of multicast sources per group                                                                        | All platforms, except Summit X430, X440 | 43                  |
| <b>PIM IPv6 Limits</b> —maximum number of dynamic rendezvous points per multicast group                                                      | All platforms, except Summit X430, X440 | 64                  |
| <b>PIM IPv6 Limits</b> —maximum number of secondary address per interface                                                                    | All platforms, except Summit X430, X440 | 70                  |

Table 2: Supported Limits (Continued)

| Metric                                                                                                              | Product                                                            | Limit            |
|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------|
| <b>PIM IPv6 Limits</b> —static rendezvous points                                                                    | BlackDiamond X8 series                                             | 32               |
|                                                                                                                     | BlackDiamond 8800 series                                           | 32               |
|                                                                                                                     | BlackDiamond 8900 series                                           | 32               |
|                                                                                                                     | Summit X770, X670-G2, X670v-48t                                    | 32               |
|                                                                                                                     | Summit X670, X480, X460-G2, X460                                   | 70               |
|                                                                                                                     | E4G-200, E4G-400                                                   | 70               |
| <b>Policy-based routing (PBR) redundancy</b> —maximum number of flow-redirects.                                     | All platforms                                                      | 256 <sup>m</sup> |
| <b>Policy-based routing (PBR) redundancy</b> —maximum number of next hops per each flow-direct.                     | All platforms                                                      | 32 <sup>m</sup>  |
| <b>Port-specific VLAN tags</b> —maximum number of port-specific VLAN tags                                           | All platforms                                                      | 1,023            |
| <b>Port-specific VLAN tags</b> —maximum number of port-specific VLAN tag ports                                      | BlackDiamond X8 and BlackDiamond 8800 xl-series                    | 8,090            |
|                                                                                                                     | Summit X480                                                        | 3,800            |
|                                                                                                                     | Summit X460-48t                                                    | 7,200            |
|                                                                                                                     | Summit X460-24x, X670-48x                                          | 3,400            |
|                                                                                                                     | Summit X670V-48t                                                   | 3,600            |
|                                                                                                                     | Summit X670v-48t stack                                             | 7,200            |
|                                                                                                                     | Summit X770, X670-G2                                               | 6,400            |
|                                                                                                                     | Summit X460-G2                                                     | 4,000            |
|                                                                                                                     | E4G-400                                                            | 3,400            |
| <b>Private VLANs</b> —maximum number of subscribers. Assumes a minimum of one port per network and subscriber VLAN. | E4G-200                                                            | 3,800            |
|                                                                                                                     | BlackDiamond 8800 c-, e-, xl-series with eight modules of 48 ports | 383              |
|                                                                                                                     | 8900-G96T-c modules                                                | 767              |
|                                                                                                                     | BlackDiamond X8 series                                             | 103              |
|                                                                                                                     | Summit X770                                                        | 63               |
|                                                                                                                     | Summit X670-G2, X670v-48t                                          | 47               |
|                                                                                                                     | Summit X670                                                        | 23               |
|                                                                                                                     | Summit X480                                                        | 53               |
|                                                                                                                     | Summit X460-G2, X460                                               | 25               |
|                                                                                                                     | Summit X440                                                        | 27               |
|                                                                                                                     | Summit X430                                                        | 11               |
|                                                                                                                     | E4G-200                                                            | 33               |
|                                                                                                                     | E4G-400                                                            |                  |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                           | Product                                                  | Limit                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Private VLANs</b> —maximum number of private VLANs with an IP address on the network VLAN.<br><br><b>NOTE:</b> 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, X460, X480, X670-G2, X460-G2                | 1,024                                                                                                                                            |
|                                                                                                                                                                                                                                                                  | Summit X670, X480, X460                                  | 512                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | Summit X440                                              | 256                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | Summit X440                                              | 127                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | E4G-200, E4G-400                                         | 512                                                                                                                                              |
| <b>Private VLANs</b> —maximum number of private VLANs in an L2-only environment.                                                                                                                                                                                 | BlackDiamond 8800 c-, e-series                           | 384                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | BlackDiamond 8900 series                                 | 2,046                                                                                                                                            |
|                                                                                                                                                                                                                                                                  | BlackDiamond X8 series                                   | 2,046                                                                                                                                            |
|                                                                                                                                                                                                                                                                  | E4G-200                                                  | 597                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | E4G-400                                                  | 1,280                                                                                                                                            |
|                                                                                                                                                                                                                                                                  | Summit X440                                              | 127                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | Summit X480                                              | 2,046                                                                                                                                            |
|                                                                                                                                                                                                                                                                  | Summit X670                                              | 597                                                                                                                                              |
|                                                                                                                                                                                                                                                                  | Summit X460                                              | 820                                                                                                                                              |
| <b>PTP/1588v2 Clock Ports</b>                                                                                                                                                                                                                                    | Summit X770, X460-G2, X670-G2, and E4G cell site routers | 32 for boundary clock                                                                                                                            |
|                                                                                                                                                                                                                                                                  |                                                          | 1 for ordinary clock                                                                                                                             |
| <b>PTP/1588v2 Clock Instances</b>                                                                                                                                                                                                                                | Summit X770, X670-G2, X460-G2, and E4G cell site routers | 2 combinations: <ul style="list-style-type: none"> <li>Transparent clock + ordinary clock</li> <li>Transparent clock + boundary clock</li> </ul> |
| <b>PTP/1588v2 Unicast Static Slaves</b>                                                                                                                                                                                                                          | Summit X770, X670-G2, X460-G2, and E4G cell site routers | 40 entries per clock port                                                                                                                        |
| <b>PTP/1588v2 Unicast Static Masters</b>                                                                                                                                                                                                                         | Summit X770, X670-G2, X460-G2, and E4G cell site routers | 10 entries per clock type                                                                                                                        |
| <b>Route policies</b> —suggested maximum number of lines in a route policy file.                                                                                                                                                                                 | All platforms                                            | 10,000                                                                                                                                           |
| <b>RIP Learned Routes</b> —maximum number of RIP routes supported without aggregation.                                                                                                                                                                           | All platforms, except Summit X430                        | 10,000                                                                                                                                           |
| <b>RIP neighbors</b> —maximum number of RIP neighbors.                                                                                                                                                                                                           | E4G-200                                                  | 256                                                                                                                                              |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                                         | Product                                            | Limit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|
| <b>RIP interfaces on a single router</b> —recommended maximum number of RIP routed interfaces on a switch.                                                                                                                                                                                                     | BlackDiamond 8000 series                           | 256   |
|                                                                                                                                                                                                                                                                                                                | BlackDiamond X8 series                             | 256   |
|                                                                                                                                                                                                                                                                                                                | BlackDiamond 8900 xl-series                        | 384   |
|                                                                                                                                                                                                                                                                                                                | Summit X440                                        | 128   |
|                                                                                                                                                                                                                                                                                                                | Summit X460, X670-G2, X460-G2                      | 256   |
|                                                                                                                                                                                                                                                                                                                | Summit X480                                        | 384   |
|                                                                                                                                                                                                                                                                                                                | Summit X670, X770                                  | 256   |
|                                                                                                                                                                                                                                                                                                                | E4G-400                                            | 256   |
| <b>RIPng learned routes</b> —maximum number of RIPng routes.                                                                                                                                                                                                                                                   | BlackDiamond 8000 series                           | 3,000 |
|                                                                                                                                                                                                                                                                                                                | BlackDiamond X8 series                             | 3,000 |
|                                                                                                                                                                                                                                                                                                                | BlackDiamond 8900 xl-series                        | 5,000 |
|                                                                                                                                                                                                                                                                                                                | Summit X480                                        | 5,000 |
|                                                                                                                                                                                                                                                                                                                | Summit X460, X670, X670-G2, X460-G2, X770          | 3,000 |
|                                                                                                                                                                                                                                                                                                                | E4G-200                                            | 3,000 |
| <b>Spanning Tree (maximum STPDs)</b> —maximum number of Spanning Tree Domains on port mode EMISTP.                                                                                                                                                                                                             | All platforms (except Summit X430 and Summit X440) | 64    |
|                                                                                                                                                                                                                                                                                                                | Summit X440                                        | 32    |
|                                                                                                                                                                                                                                                                                                                | Summit X430                                        | 16    |
| <b>Spanning Tree PVST+</b> —maximum number of port mode PVST domains.<br><b>NOTE:</b> <ul style="list-style-type: none"><li>Maximum of 10 active ports per PVST domain when 256 PVST domains are configured.</li><li>Maximum of 7 active ports per PVST domain when 128 PVST domains are configured.</li></ul> | BlackDiamond X8 and 8900 series switches           | 256   |
|                                                                                                                                                                                                                                                                                                                | Summit X670, X770, X670-G2                         | 256   |
|                                                                                                                                                                                                                                                                                                                | Summit X460, X480, X440, X460-G2                   | 128   |
|                                                                                                                                                                                                                                                                                                                | Summit X430                                        | 50    |
|                                                                                                                                                                                                                                                                                                                | E4G-400                                            | 128   |
|                                                                                                                                                                                                                                                                                                                |                                                    |       |
| <b>Spanning Tree</b> —maximum number of multiple spanning tree instances (MSTI) domains.                                                                                                                                                                                                                       | All platforms (except Summit X430 and Summit X440) | 64    |
|                                                                                                                                                                                                                                                                                                                | Summit X440                                        | 32    |
|                                                                                                                                                                                                                                                                                                                | Summit X430                                        | 5     |
| <b>Spanning Tree</b> —maximum number of VLANs per MSTI.<br><b>NOTE:</b> Maximum number of 10 active ports per VLAN when all 500 VLANs are in one MSTI.                                                                                                                                                         | BlackDiamond X8                                    | 500   |
|                                                                                                                                                                                                                                                                                                                | BlackDiamond 8800                                  | 500   |
|                                                                                                                                                                                                                                                                                                                | BlackDiamond 8900 MSM 128/XL                       | 500   |
|                                                                                                                                                                                                                                                                                                                | Summit X770, X670-G2, X670v-48t, X670              | 500   |
|                                                                                                                                                                                                                                                                                                                | Summit X480, X460-G2, X460                         | 600   |
|                                                                                                                                                                                                                                                                                                                | E4G-200                                            | 500   |
|                                                                                                                                                                                                                                                                                                                | E4G-400                                            | 600   |
|                                                                                                                                                                                                                                                                                                                | Summit X440                                        | 250   |
|                                                                                                                                                                                                                                                                                                                | Summit X430                                        | 100   |
|                                                                                                                                                                                                                                                                                                                |                                                    |       |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                | Product                                            | Limit |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|
| <b>Spanning Tree</b> —maximum number of VLANs on all MSTP instances.                                                  | BlackDiamond X8                                    | 1,000 |
|                                                                                                                       | BlackDiamond 8800                                  | 1,000 |
|                                                                                                                       | BlackDiamond 8900 MSM 128/XL                       | 1,000 |
|                                                                                                                       | Summit X770                                        | 1,024 |
|                                                                                                                       | Summit X670-G2, X670v-48t, X670, X480              | 1,000 |
|                                                                                                                       | Summit X460-G2, X460                               | 1,024 |
|                                                                                                                       | E4G-200                                            | 1,000 |
|                                                                                                                       | E4G-400                                            | 1,024 |
|                                                                                                                       | Summit X440                                        | 500   |
|                                                                                                                       | Summit X430                                        | 200   |
| <b>Spanning Tree (802.1d domains)</b> —maximum number of 802.1d domains per port.                                     | All platforms                                      | 1     |
| <b>Spanning Tree (number of ports)</b> —maximum number of ports including all Spanning Tree domains.                  | All platforms (except Summit X430 and Summit X440) | 4,096 |
|                                                                                                                       | Summit X440                                        | 2,048 |
|                                                                                                                       | Summit X430                                        | 1,024 |
| <b>Spanning Tree (maximum VLANs)</b> —maximum number of STP protected VLANs (dot1d and dot1w).                        | BlackDiamond X8                                    | 1,024 |
|                                                                                                                       | BlackDiamond 8800                                  | 1,024 |
|                                                                                                                       | BlackDiamond 8900 MSM 128/XL                       | 1,024 |
|                                                                                                                       | Summit X770                                        | 1,024 |
|                                                                                                                       | Summit X670-G2, X670v-48t, X670, X480              | 560   |
|                                                                                                                       | Summit X460-G2, X460                               | 600   |
|                                                                                                                       | E4G2-00                                            | 500   |
|                                                                                                                       | E4G-400                                            | 600   |
|                                                                                                                       | Summit X440                                        | 500   |
|                                                                                                                       | Summit X430                                        | 128   |
| <b>SSH (number of sessions)</b> —maximum number of simultaneous SSH sessions.                                         | All platforms                                      | 8     |
| <b>Static MAC multi-cast FDB entries</b> —maximum number of permanent multi-cast MAC entries configured into the FDB. | BlackDiamond 8000 c-, e-, xl-series                | 1,024 |
|                                                                                                                       | BlackDiamond X8 series                             | 1,024 |
|                                                                                                                       | All Summits                                        | 1,024 |
|                                                                                                                       | E4G-200, E4G-400                                   | 1,024 |
| <b>Syslog servers</b> —maximum number of simultaneous syslog servers that are supported.                              | All platforms                                      | 4     |
| <b>Telnet (number of sessions)</b> —maximum number of simultaneous Telnet sessions.                                   | All BlackDiamonds                                  | 8     |
|                                                                                                                       | All Summits                                        | 16    |
|                                                                                                                       | E4G cell site routers                              | 16    |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                    | Product                                         | Limit   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------|
| <b>TRILL</b> —trees rooted from switch                                                                                                                                                    | BlackDiamond X8                                 | 1       |
|                                                                                                                                                                                           | Summit X670, X770                               | 1       |
| <b>TRILL</b> —computed trees                                                                                                                                                              | BlackDiamond X8                                 | 1       |
|                                                                                                                                                                                           | Summit X670, X770                               | 1       |
| <b>TRILL</b> —TRILL VLANs                                                                                                                                                                 | BlackDiamond X8                                 | 4       |
|                                                                                                                                                                                           | Summit X670, X770                               | 4       |
| <b>TRILL</b> —forwarding VLANs                                                                                                                                                            | BlackDiamond X8                                 | 4,095   |
|                                                                                                                                                                                           | Summit X670, X770                               | 4,095   |
| <b>TRILL</b> —forwarding ports                                                                                                                                                            | BlackDiamond X8                                 | All     |
|                                                                                                                                                                                           | Summit X670, X770                               | All     |
| <b>TRILL</b> —RBridge FDB entries                                                                                                                                                         | BlackDiamond X8                                 | 128,000 |
|                                                                                                                                                                                           | Summit X670                                     | 128,000 |
|                                                                                                                                                                                           | Summit X770                                     | 288,000 |
| <b>TRILL</b> —ECMP RBridge next hops                                                                                                                                                      | BlackDiamond X8                                 | 8       |
|                                                                                                                                                                                           | Summit X670, X770                               | 8       |
| <b>TRILL</b> —neighbor adjacencies                                                                                                                                                        | BlackDiamond X8                                 | 32      |
|                                                                                                                                                                                           | Summit X670, X770                               | 32      |
| <b>TRILL</b> —nodes                                                                                                                                                                       | BlackDiamond X8                                 | 256     |
|                                                                                                                                                                                           | Summit X670, X770                               | 256     |
| <b>TRILL</b> —links                                                                                                                                                                       | BlackDiamond X8                                 | 2,000   |
|                                                                                                                                                                                           | Summit X670, X770                               | 2,000   |
| <b>Virtual routers</b> —maximum number of user-created virtual routers that can be created on a switch.<br><b>NOTE:</b> Virtual routers are not supported on Summit X440 series switches. | BlackDiamond 8000 c-, xl-, xm-series            | 63      |
|                                                                                                                                                                                           | BlackDiamond X8 series                          | 63      |
|                                                                                                                                                                                           | E4G-200, E4G-400                                | 63      |
|                                                                                                                                                                                           | Summit X460, X460-G2, X480, X670, X670-G2, X770 | 63      |
|                                                                                                                                                                                           |                                                 |         |
| <b>Virtual router forwarding (VRFs)</b> —maximum number of VRFs that can be created on a switch.<br><b>NOTE:</b> * Subject to other system limitations.                                   | All platforms, except Summit X440, X430         | 960 *   |
|                                                                                                                                                                                           |                                                 |         |
| <b>Virtual router protocols per VR</b> —maximum number of routing protocols per VR.                                                                                                       | All platforms, except Summit X440, X430         | 8       |
| <b>Virtual router protocols per switch</b> —maximum number of VR protocols per switch.                                                                                                    | All platforms, except Summit X440, X430         | 64      |
| <b>VLAN aggregation</b> —maximum number of port-VLAN combinations on any one superVLAN and all of its subVLANs.                                                                           | All platforms (except Summit X440)              | 1,000   |
|                                                                                                                                                                                           | Summit X440                                     | 256     |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                         | Product                                                                                                       | Limit  |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------|
| <b>VLANs</b> —includes all VLANs.                                                                                              | All platforms                                                                                                 | 4,094  |
| <b>VLANs</b> —maximum number of port-specific tag VLANs.                                                                       | BlackDiamond 8800 xl-series only,<br>BlackDiamond X8 series                                                   | 1,023  |
|                                                                                                                                | BlackDiamond X8 xl-series                                                                                     | 4,093  |
|                                                                                                                                | Summit X460, X770, X480,<br>E4G-400, X670-G2, X460-G2                                                         | 4,093  |
|                                                                                                                                | Summit X670, X670V-48t                                                                                        | 1,023  |
|                                                                                                                                | E4G-400                                                                                                       | 4,093  |
|                                                                                                                                | E4G-200                                                                                                       | 2,047  |
| <b>VLANs</b> —maximum number of port-specific tag VLAN ports                                                                   | Summit X460, X670, X670V-48t,<br>X460-G2, BlackDiamond 8800 xl-series only, BlackDiamond X8, E4G-400, E4G-200 | 4,096  |
|                                                                                                                                | BlackDiamond X8 xl-series                                                                                     | 32,767 |
|                                                                                                                                | Summit X770, X670-G2                                                                                          | 8,192  |
|                                                                                                                                | Summit X480                                                                                                   | 16,383 |
| <b>VLANs (Layer 2)</b> —maximum number of Layer 2 VLANs.                                                                       | All platforms                                                                                                 | 4,094  |
| <b>VLANs (Layer 3)</b> —maximum number of VLANs performing IPv4 and/or IPv6 routing. Excludes sub-VLANs.                       | Summit X460-G2, X670, X770,<br>X670-G2, and BlackDiamond X8                                                   | 2,048  |
|                                                                                                                                | Summit X440                                                                                                   | 254    |
|                                                                                                                                | Summit X480, X460                                                                                             | 512    |
|                                                                                                                                | E4G-200, E4G-400                                                                                              | 512    |
| <b>VLANs (maximum active port-based)</b> —(Maximum active ports per VLAN when 4,094 VLANs are configured with default license) | BlackDiamond X8                                                                                               | 32     |
|                                                                                                                                | BlackDiamond 8800 series                                                                                      | 32     |
|                                                                                                                                | Summit X770, X670-G2, X670v-48t,<br>X670, X480, X460-G2, X460                                                 | 32     |
|                                                                                                                                | E4G2-00                                                                                                       | 12     |
|                                                                                                                                | E4G-400                                                                                                       | 32     |
|                                                                                                                                | Summit X440                                                                                                   | 11     |
|                                                                                                                                | Summit X430                                                                                                   | 2      |
| <b>VLANs (maximum active protocol-sensitive filters)</b> —number of simultaneously active protocol filters in the switch.      | All platforms                                                                                                 | 15     |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                                                                                                                                                    | Product                                                                                                                                                                                                    | Limit                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>VLAN translation</b> —maximum number of translation VLANs. Assumes a minimum of one port per translation and member VLAN.                                                                                                                                                              | BlackDiamond 8000 a-, c-, e-, xl series<br><br>Summit X770<br>Summit X670-G2, X670v-48t<br>Summit X670<br>Summit X480<br>Summit X460-G2<br>Summit X460<br>E4G-200<br>E4G-400<br>Summit X440<br>Summit X430 | with eight modules of 48 ports (383)<br>8900-G96T-c modules (767)<br>103<br>63<br>47<br>23<br>53<br>57<br>11<br>33<br>25<br>27 |
| <b>VLAN translation</b> —maximum number of translation VLAN pairs with an IP address on the translation VLAN.<br><br><b>NOTE:</b> 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<br>Summit X670, X480, X460<br>Summit X460-G2<br>E4G-200, E4G-400<br>Summit X440                                                                                                       | 1,024<br>512<br>1,024<br>512<br>127                                                                                            |
| <b>VLAN translation</b> —maximum number of translation VLAN pairs in an L2-only environment.                                                                                                                                                                                              | BlackDiamond 8800 c-, e-series<br>BlackDiamond 8900 xl-series<br>BlackDiamond X8 series<br>Summit X460, X670-G2, X460-G2<br>E4G-400, E4G-200<br>Summit X440<br>Summit X480, X670, X770<br>Summit X430      | 384<br>2,046<br>2,046<br>2,000<br>2,000<br>512<br>2,046<br>100                                                                 |
| <b>VRRP (v2/v3-IPv4) (maximum instances)</b> —maximum number of VRRP instances for a single switch, with Advanced Edge license or higher.                                                                                                                                                 | BlackDiamond X8, 8800 c-series<br>MSM-48c, and BlackDiamond 8900 xl-series 8900-MSM128<br>Summit X770, X670, X670-G2, X460-G2, X480<br>E4G-200, E4G-400<br>Summit X460<br>Summit X440                      | 511<br><br>511<br>128<br>255<br>32                                                                                             |

Table 2: Supported Limits (Continued)

| Metric                                                                                                                                                       | Product                                                                                   | Limit                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>VRRP (v3-IPv6) (maximum instances)</b> —maximum number of VRRP instances for a single switch, with Advanced Edge license or higher.<br>(VRRP-VRRPv3-IPv6) | BlackDiamond X8, 8800 c-series<br>MSM-48c, and BlackDiamond 8900<br>xl-series 8900-MSM128 | 511                                           |
|                                                                                                                                                              | Summit X770, X670, X670-G2,<br>X460-G2                                                    | 511                                           |
|                                                                                                                                                              | E4G-200, E4G-400                                                                          | 255                                           |
|                                                                                                                                                              | Summit X460                                                                               | 255                                           |
|                                                                                                                                                              | Summit X480                                                                               | 255                                           |
|                                                                                                                                                              | Summit X440                                                                               | 15                                            |
| <b>VRRP (v2/v3-IPv4/IPv6) (maximum VRID)</b> —maximum number of unique VRID numbers per switch.                                                              | All platforms with Advanced Edge license or higher, except Summit X430                    | 7                                             |
| <b>VRRP (v2/v3-IPv4/IPv6) (maximum VRIDs per VLAN)</b> —maximum number of VRIDs per VLAN.                                                                    | All platforms with Advanced Edge license or higher, except for Summit X430                | 7                                             |
| <b>VRRP (v2/v3-IPv4/IPv6) (maximum ping tracks)</b> —maximum number of ping tracks per VLAN.                                                                 | All platforms with Advanced Edge license or higher, except Summit X430                    | 8                                             |
| <b>VRRP (maximum ping tracks)</b> —maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher.           | All platforms, except the Summit X440                                                     | 8 (20 centisecond or 1 second hello interval) |
|                                                                                                                                                              | Summit X440<br>Hello interval: 20 centiseconds                                            | 1                                             |
|                                                                                                                                                              | Summit X440<br>Hello interval: 1 second                                                   | 1                                             |
| <b>VRRP (v3-IPv6) (maximum ping tracks)</b> —maximum number of ping tracks per VRRP Instance under 128 VRRP instances, with Advanced Edge license or higher. | All platforms, except the Summit X440                                                     | 8 (20 centisecond or 1 second hello interval) |
|                                                                                                                                                              | Summit X440<br>Hello interval: 20 centiseconds                                            | 1 (IPv6)                                      |
|                                                                                                                                                              | Summit X440<br>Hello interval: 1 second                                                   | 1 (IPv6)                                      |
| <b>VRRP (v2/v3-IPv4/IPv6) (maximum iproute tracks)</b> —maximum number of IP route tracks per VLAN.                                                          | All platforms with Advanced Edge license or higher, except Summit X430                    | 8                                             |
| <b>VRRP (v2/v3-IPv4/IPv6)</b> —maximum number of VLAN tracks per VLAN.                                                                                       | All platforms with Advanced Edge license or higher, except Summit X430                    | 8                                             |

**Table 2: Supported Limits (Continued)**

| Metric                                                                                                                                                                            | Product                                                                                                                                                                                 | Limit                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>XML requests</b> —maximum number of XML requests per second.<br><b>NOTE:</b> Limits are dependent on load and type of XML request. These values are dynamic ACL data requests. | BlackDiamond 8800 c-series<br>with 100 DACLs<br>with 500 DACLs<br>BlackDiamond 8900 series<br>with 100 DACLs<br>with 500 DACLs<br>Summit X480, X670<br>with 100 DACLs<br>with 500 DACLs | 10<br>3<br><br>10<br>3<br><br>4<br>1 |
| <b>XNV authentication</b> —maximum number of VMs that can be processed (combination of local and network VMs).                                                                    | All platforms, except Summit X430                                                                                                                                                       | 2,048                                |
| <b>XNV database entries</b> —maximum number of VM database entries (combination of local and network VMs).                                                                        | All platforms, except Summit X430                                                                                                                                                       | 16,000                               |
| <b>XNV database entries</b> —maximum number of VPP database entries (combination of local and network VPPs).                                                                      | All platforms, except Summit X430                                                                                                                                                       | 2,048                                |
| <b>XNV dynamic VLAN</b> —Maximum number of dynamic VLANs created (from VPPs /local VMs).                                                                                          | All Platforms, except Summit X430                                                                                                                                                       | 2,048                                |
| <b>XNV local VPPs</b> —maximum number of XNV local VPPs.                                                                                                                          | All platforms, except Summit X430<br>Ingress<br>Egress                                                                                                                                  | 2,048<br>512                         |
| <b>XNV policies/dynamic ACLs</b> —maximum number of policies/dynamic ACLs that can be configured per VPP. <sup>n</sup>                                                            | All platforms, except Summit X430<br>Ingress<br>Egress                                                                                                                                  | 8<br>4                               |
| <b>XNV network VPPs</b> —maximum number of XNV network VPPs. <sup>n</sup>                                                                                                         | All platforms, except Summit X430<br>Ingress<br>Egress                                                                                                                                  | 2,048<br>512                         |

- a. The table shows the total available.
- b. Limit depends on setting configured for `configure forwarding external-tables`.
- c. When there are BFD sessions with minimal timer, sessions with default timer should not be used.
- d. Based on forwarding internal table configuration "I2-only".
- e. Effective capacity varies based on actual MAC addresses and VLAN IDs used and hash algorithm selected.
- f. Applies only if all enabled BlackDiamond 8000 I/O modules are BlackDiamond 8000 c-, xl-, or xm-series modules.
- g. Effective capacity varies based on actual IP addresses and hash algorithm selected, but is higher for BlackDiamond 8000 c-, xl-, xm-series modules, BlackDiamond X8, E4G cell site routers, and Summit X460 and X480 switches compared to BlackDiamond 8000 e-series modules.
- h. For the MVR feature in the BlackDiamond X8 series switches, the number of senders applies only when there are few egress VLANs with subscribers. If there are many VLANs with subscribers, the limit is substantially less. Only 500 senders are supported for 100 VLANs. It is not recommended to exceed these limits.
- i. Based on forwarding internal table configuration "I3-and-ipmc".
- j. The limit depends on setting configured with `configure iproute reserved-entries`.
- k. The IPv4 and IPv6 multi-cast entries share the same hardware tables, so the effective number of IPv6 multi-cast entries depends on the number of IPv4 multi-cast entries present and vice-versa.

- l. If IGMP and MLD are simultaneously configured on the switch, the number of effective subscribers supported would be appropriately lessened.
- m. Sum total of all PBR next hops on all flow redirects should not exceed 1024.
- n. The number of XNV authentications supported based on system ACL limitations.

# 3 Open Issues, Known Behaviors, and Resolved Issues

This chapter describes items needing further clarification and behaviors that might not be intuitive. It also includes the items that have been resolved.

This chapter contains the following sections:

- [Open Issues on page 72](#)
- [Known Behaviors on page 75](#)
- [Resolved Issues in ExtremeXOS 15.6 on page 76](#)

## Open Issues

The following are new open issues for supported features found in ExtremeXOS 15.6.

**Table 3: Open Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| xos0058143     | When creating a netlogin-user, some information is truncated in the output of the command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| xos0056894     | The new default state for LLDP is enabled in ExtremeXOS 15.6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| xos0058144     | On a clean switch with no configuration, the command <b>show configuration netlogin</b> shows the base URL for netlogin as "network-access.com". It should be "network-access.net".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| xos0056340     | Unknown Layer 2 traffic from Isolated subscriber VLANs are forwarded to the remote MLAG ports, even though local MLAG ports are up.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| xos0057913     | Switch stops responding and you cannot save or show a configuration after disabling BGP and deleting virtual routing and forwarding (VRF).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| xos0055511     | <p>While configuring STP (802.1d) with port-encapsulation mode as EMISTP where the L2PT-enabled VMAN and access VLAN have the same tag, the designated bridge is not accepting the L2PT tunneled BPDUs from the root bridge, and thus causes a loop (designated bridge also becomes a root bridge).</p> <p>This problem does not occur:</p> <ul style="list-style-type: none"><li>• When the access VLAN's tag and the L2PT-enabled VMAN's tag are different.</li><li>• Without any L2PT configured, with the same tag used for the access VLAN and provider-edge VMAN.</li><li>• When using Per-VLAN Spanning Tree Plus (PVST+), regardless of same or different tags.</li></ul> |

**Table 3: Open Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number                                | Description                                                                                                                                                                                                                                                           |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| xos0055517                               | L2PT filter match criteria for tunneling does not work for destination-mac, etype, and offset combination when ingress traffic on access ports has a VLAN tag.                                                                                                        |
| <b>BlackDiamond 8800 Series Switches</b> |                                                                                                                                                                                                                                                                       |
| xos0056118                               | TCP red packets are not dropped when the wredprofile is set up to discard them.                                                                                                                                                                                       |
| xos0057624                               | On a PVLAN, after restarting process VRRP on the VRRP master switch, traffic loss occurs in the switch.                                                                                                                                                               |
| <b>BlackDiamond X8 Series Switches</b>   |                                                                                                                                                                                                                                                                       |
| xos0055864                               | When you configure a large ACL (999 rules) on a port, slow path traffic rate drops down to 1,00–2,00 packets/second from a rate of 55,000–60,000 packets/second.                                                                                                      |
| xos0056067                               | BlackDiamond X8 series switches take an excessive time (about 3 to 4 minutes) to learn source MAC addresses if pseudowires (PWs) carrying the addresses change.                                                                                                       |
| <b>Summit Family Switches</b>            |                                                                                                                                                                                                                                                                       |
| xos0057240                               | On the Summit X460-G2 and X670-G2 series switches, TRILL support is not available.                                                                                                                                                                                    |
| xos0057250                               | Restarting BGP processes or rebooting the switch re-enables BGP processes running on disabled VPN-VRFs.                                                                                                                                                               |
| <b>SummitStack</b>                       |                                                                                                                                                                                                                                                                       |
| 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.                                                           |
| xos0056075                               | After issuing the command <code>restart process ospf-5</code> on a SummitStack, H-VPLS (spoke) nodes fail to encapsulate packets to VPLS pseudowires. Traffic is restored after about 15 minutes.                                                                     |
| <b>Summit X430 Series Switches</b>       |                                                                                                                                                                                                                                                                       |
| xos0056063                               | Summit X430-48t switches can only create a maximum of 3,932 VLANs; Summit X430-24t switches can only create a maximum of 3,996 VLANs. The published limit for Summit X430 series switches is 4,094 VLANs. Other Summit X430 series switches can meet the 4,094 limit. |

**Table 3: Open Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| xos0055518                            | <p>On Summit X460 series switches with OpenFlow enabled, switches boot up with the following error messages:</p> <pre> "Error while loading structure &lt;cfgTechSupport&gt;&lt;basic&gt;1&lt;/basic&gt;&lt;hour&gt;0&lt;/ hour&gt;&lt;srcipaddress&gt;10.68.63.86&lt;/ srcipaddress&gt;&lt;hostname&gt;&lt;![CDATA[12.38.14.200]]&gt;&lt;/ hostname&gt;&lt;sslEnabled&gt;0&lt;/sslEnabled&gt;&lt;port&gt;800&lt;/ port&gt;&lt;daily&gt;0&lt;/daily&gt;&lt;isDefault&gt;1&lt;/ isDefault&gt;&lt;bootup&gt;1&lt;/bootup&gt;&lt;automatic&gt;1&lt;/ automatic&gt;&lt;nameIndex&gt;&lt;![CDATA[12.38.14.200]]&gt;&lt;/ nameIndex&gt;&lt;errorDetected&gt;0&lt;/ errorDetected&gt;&lt;vrName&gt;&lt;![CDATA[VR-Mgmt]]&gt;&lt;/vrName&gt;&lt;/ cfgTechSupport&gt;: Source IP address 10.68.63.86 does not belong to the VR VR-Mgmt. &lt;cfgTechSupport&gt;"  "Error while loading structure &lt;openflowGlobalConfig&gt;&lt;numVlans&gt;2&lt;/ numVlans&gt;&lt;version&gt;0&lt;/version&gt;&lt;fdb&gt;0&lt;/ fdb&gt;&lt;isEnabled&gt;1&lt;/isEnabled&gt;&lt;/openflowGlobalConfig&gt;: Error: Invalid OpenFlow version&lt;openflowGlobalConfig&gt;" </pre> |
| <b>Summit X670 Series Switches</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| xos0055917                            | With OpenFlow v1.3 enabled, the switch stops responding after executing the <b>disable openflow</b> command. This problem does not occur when the switch has OpenFlow v1.0 enabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Summit X670-G2 Series Switches</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| xos0056400                            | BGP does not elect the best path after failover on SummitStacks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Summit X770 Series Switches</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| xos0056006                            | When broadcast traffic is flowing, after disabling, and then enabling a port, the port can take more than 15 seconds to become active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ERPS</b>                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| xos0055399                            | After multiple failures in a main ring, the Ring Protection Link (RPL) of the sub-ring stays in the blocked state in an RPL neighbor node of the sub-ring causing traffic to fail between the nodes in the sub-ring.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| xos0056122                            | <p>Configuring MEP IDs through ERPS (for dynamic CFM creation) commands are unavailable.</p> <p>However, existing configuration files that contain ERPS commands with east/west MEP IDs specified are still loaded correctly, with the underlying CFM created properly by ERPS. Also, the command <b>show configuration</b> displays the configuration properly. However, you cannot modify the MEP ID through the CLI.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>OpenFlow</b>                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| xos0056061                            | The OpenFlow switch is not actively sending out hello messages when the 3-way TCP connection is established.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Known Behaviors

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

**Table 4: Known Issues, Platform-Specific, and Feature Change Requets (CRs)**

| CR Number                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| xos0056975                          | PIM-SM: Traffic loss occurs for up to 60 seconds when the ingress port on a non-designated, first-hop router (FHR) is disabled.                                                                                                                                                                                                                                                                                                                              |
| xos0055977                          | After disabling the EAPS shared port and a segment port in a partner node, traffic fails to flow for 30 seconds after enabling this segment port.                                                                                                                                                                                                                                                                                                            |
| xos0057187                          | BFD does not work if the client is a VRF leaked route in another VR or VRF. Configuring BFD session to a virtual IP is unsupported.<br><b>Workaround:</b> Configure a dummy static route in VR.                                                                                                                                                                                                                                                              |
| <b>BlackDiamond Series Switches</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| xos0055816                          | BlackDiamond 8800 c-series modules support IPv6 routes with masks greater than 64 only for virtual router "VR-Default". The following error appears if a user-created virtual router is used in this scenario:<br><br>"<Warn:HAL.IPv6FIB.LongMskUsrVRNoSuprt> MSM-A: Installing IPv6 routes w/ mask > 64 bits with a user virtual router is not supported on G24Xc,G48Xc,G48Tc,10G4Xc,10G8Xc,S-G8Xc, S-10G1Xc and S-10G2Xc. These routes are not installed." |
| <b>Summit Series Switches</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| xos0056142                          | In Summit X460-G2 series switches, the software table size is limited by the hardware table size, which limits FDB to 65K.                                                                                                                                                                                                                                                                                                                                   |
| xos0057210                          | On Summit X430 series switches, NTP configuration is lost and NTP is not supported when upgrading to ExtremeXOS 15.6.                                                                                                                                                                                                                                                                                                                                        |

## Resolved Issues in ExtremeXOS 15.6

The following issues were resolved in ExtremeXOS 15.6. ExtremeXOS 15.6 includes all fixes up to and including ExtremeXOS 11.6.5.3, and earlier, ExtremeXOS 12.0.5, ExtremeXOS 12.1.7, ExtremeXOS 12.2.2-patch1-12, ExtremeXOS 12.3.6, ExtremeXOS 12.4.5, ExtremeXOS 12.5.5, ExtremeXOS 12.6.3, ExtremeXOS 12.6.5, ExtremeXOS 12.7.1, ExtremeXOS 15.1.5, ExtremeXOS 15.2.4, ExtremeXOS 15.3.3, ExtremeXOS 15.4.1, ExtremeXOS 15.5.1, and ExtremeXOS 15.5.2. For information about those fixes, see the release notes for the specific release.

**Table 5: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number      | Description                                                                                                                                                                                                      |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b> |                                                                                                                                                                                                                  |
| xos0052365     | Unconfiguring L3VPN and then configuring it again results in BGP failing to advertise the routes.                                                                                                                |
| xos0053543     | Switch responds to a GARP attack for an IP address that is configured as a static IP ARP entry with the switch MAC address, but the switch should respond with the MAC address listed in the static IPARP entry. |
| xos0054120     | Enabling IPv6 smart relay at VR level does not forward the relay-forward solicit from having multiple BOOTPv6 relay enabled agents.                                                                              |
| xos0055055     | CliMaster process ends unexpectedly when the telnet session disconnects from the switch while it is printing a lengthy debug output.                                                                             |
| xos0055311     | IPARP entries are cleared immediately after they are learned from source VLAN port when IPARP timeout is disabled.                                                                                               |
| xos0055476     | DHCP decline packets are dropped if the client address field within the DHCP decline packet is 0.0.0.0.                                                                                                          |
| xos0055477     | Switches don't allow configuring L2PT protocol filter with dest-mac, etype, etc.                                                                                                                                 |
| xos0055526     | The command <code>set var emp3 \$tcl)</code> produces the error <b>"Error: Unsupported TCL Command"</b> , but it should show <b>"%% Missing close parenthesis at '^' marker."</b>                                |
| xos0055585     | Multicast traffic can take up to 60 seconds to recover when an ingress port on a first-hop router (FHR) is disabled.                                                                                             |
| xos0055611     | PIM does not failover to alternate source received from the MSDP peers when the primary source fails.                                                                                                            |
| xos0055662     | Delays in triggering a cyclic UPM profile, cause the next FireTime to be calculated using the delayed current time.                                                                                              |
| xos0055685     | UPM process ends unexpectedly when the command <code>show config upm</code> is executed repeatedly for a prolonged time.                                                                                         |
| xos0055754     | Login authentication event is generated for Lawful Intercept user if the user logs on using SSH.                                                                                                                 |
| xos0055783     | Switches drop packets and display <b>"Invalid MAC Binding"</b> error when you remove an existing client and connect a different client with the same IP address.                                                 |

**Table 5: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number                                | Description                                                                                                                                                                                                                                                |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| xos0055849                               | By enabling ACL log filters, admin user can see the dynamic ACL binding/unbinding information of Lawful Intercept user.                                                                                                                                    |
| xos0055884                               | Unicast traffic is dropped completely in fabric after destination MAC addresses are moved from one slot to another.                                                                                                                                        |
| xos0055939                               | EXSH assert failure occurs when executing commands containing port lists separated by commas when last port number is followed by TAB key sequence.                                                                                                        |
| xos0056115                               | Some VRRP VLANs undergo state change when ports belonging to VRRP VLANs that are VLAN/route tracked are disabled/enabled.                                                                                                                                  |
| xos0057088                               | Cannot log on using SSH with a 32-character or greater password. After eight logon attempts, no more SSH connections are permitted.                                                                                                                        |
| <b>BlackDiamond 8800 Series Switches</b> |                                                                                                                                                                                                                                                            |
| xos0052294                               | A port in the ISC VLAN is incorrectly allowed to be configured as an MLAG port.                                                                                                                                                                            |
| xos0052349                               | Process rtmgr ends unexpectedly with signal 11 while disabling an I/O slot in a BGP configuration.                                                                                                                                                         |
| <b>BlackDiamond X8 Series Switches</b>   |                                                                                                                                                                                                                                                            |
| xos0050424                               | Slot goes into failed state after running extended diagnostics.                                                                                                                                                                                            |
| xos0053683                               | DHCP packets from sub-VLANs are not egressing through the super VLAN ports.                                                                                                                                                                                |
| xos0053879                               | The error " <b>&lt;Error:HAL.MPLS.Error&gt; MM-A: ILM instance 872677376 not found</b> " appears after issuing the command <b>clear counters mpls rsvp-te</b> .                                                                                            |
| xos0055282                               | Strict-Priority (SP) and Weighted-Deficit-Round-Robin (WDRR) scheduling are not supported on the BlackDiamond XB-100G4X in this release.<br><br>Weighted-Round-Robin (WRR) scheduling is supported on the BlackDiamond X8-100G4X switches in this release. |
| xos0055644                               | Add Extreme Networks' serial number to the "easily readable" section of CFP2 optic command <b>debug hal show optic-info slot &lt;slot&gt; port &lt;tpport&gt;</b> .                                                                                        |
| xos0055715                               | VPLS terminated traffic on 100G slots is not distributed onto LAG ports on BDXA-10G48X modules.                                                                                                                                                            |
| xos0055730                               | On BlackDiamond X8 switches with BD8-100G4X modules, MAC addresses are no longer learned on EAPS ring ports after ports are disabled and enabled multiple times.                                                                                           |
| xos0055733                               | VPLS: Multicast traffic is dropped on BD8-100G4X modules when the service port is part of a VLAN with IGMP snooping enabled.                                                                                                                               |
| xos0055803                               | Backup management cards do not enter "In Sync" state if port-specific tags are configured.                                                                                                                                                                 |

**Table 5: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number                          | Description                                                                                                                                                                                                                             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Summit Series Switches</b>      |                                                                                                                                                                                                                                         |
| xos0049797                         | ERPS process ends unexpectedly with signal 11 after issuing the command <code>delete erps submetro</code> .                                                                                                                             |
| xos0053227                         | VLAN statistics are not working after a VLAN with base PSTAG is removed and added back to ports.                                                                                                                                        |
| xos0054086                         | VLAN aggregation configurations are not removed after rebooting the switch when configuring a dynamic VLAN as the sub-VLAN.                                                                                                             |
| xos0055623                         | MLAG ports configured with LACP go down after performing a stack failover.                                                                                                                                                              |
| <b>SummitStack</b>                 |                                                                                                                                                                                                                                         |
| xos0053970                         | NTP process ends unexpectedly during switch reboot.                                                                                                                                                                                     |
| xos0055980                         | In Summit-stack, traffic passing through a port from backup node stops after adding that port to another VLAN with port specific tag configuration.                                                                                     |
| <b>Summit X460 Series Switches</b> |                                                                                                                                                                                                                                         |
| xos0058043                         | MSRP: packets are dropped when bandwidth is increased to 611 M.                                                                                                                                                                         |
| xos0052683                         | Stacking does not come up when trying to use one port in alternate and another port in native mode for stacking.                                                                                                                        |
| xos0055416                         | On Summit X460 series switches, after enabling jumbo frames on 10G ports on XGM modules, doing either a save and reboot or changing port speed settings removes the jumbo frames setting.                                               |
| <b>Summit X480 Series Switches</b> |                                                                                                                                                                                                                                         |
| xos0057602                         | Ping across VPLS domain does not succeed if the ingress port in CPE switch is part of both service VLAN (tagged) and service VMAN (untagged).                                                                                           |
| xos0056976                         | On Summit X480 series switches with 40G4X VIM modules, FDB entries are not in sync across units when FDB entries are learned and aged out frequently.                                                                                   |
| xos0057454                         | FDB entries are not aged out after two continuous MAC address moves.                                                                                                                                                                    |
| xos0057752                         | On Summit X480 series switches when untagged VLAN packets are received on tagged VMAN ports, which in turn receive from untagged VMAN ports bursts of more than 500 packets in line rate, some FDB entries are not learned in hardware. |

**Table 5: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Summit X670 Series Switches</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| xos0048730                         | After MLAG is established, enabling, and then disabling, MLAG ports produces error messages:<br>"07/30/2012 22:46:15.17 <Crit:VSM.ParmInv> : Argument MLAG HAL Block List has an invalid value 4982312"<br>"07/30/2012 22:46:15.17 <Crit:VSM.ParmInv> : Argument Ingress Port Instance has an invalid value 16777217"<br>"07/30/2012 22:46:15.17 <Erro:Kern.Error> : exvlan: handleVsmKernelRequest:7311: handleVsmKernelRequest Invalid Ingress port: 1000001 got" |
| xos0053941                         | On Summit X670 series switches, for a VPLS with two peers, the second peer counter display is incorrectly aligned in the output of command <b>show mpls statistics l2vpn</b> (second peer has extra space at start so RxBytes value is displayed near the TxPackets column).                                                                                                                                                                                        |
| xos0054631                         | On Summit X670-48x switches, ports 47 and 48 with stacking support enabled do not come up when an SFP+ transceiver (optics) module is removed, and then reinserted.                                                                                                                                                                                                                                                                                                 |
| xos0055074                         | On Summit X670v-48x series switches, links go down after rebooting if the ports are configured with auto negotiation off and the speed is 1G on both peers when using a mini Gigabit interface converter.                                                                                                                                                                                                                                                           |
| xos0056125                         | MLAG ports move to R state after multiple executions of the command <b>restart process vsm</b> .                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Summit X770 Series Switches</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| xos0053194                         | AVB is not supported on the Summit X770 series switches. Time stamp support for gPTP should be added for the platform.                                                                                                                                                                                                                                                                                                                                              |
| xos0055632                         | VPLS: On Summit X770 series switches, traffic is dropped after configuring LAG on service port (untagged VLAN port). The issue is with high port numbers (port 101, 102) on Summit X770 series switches.                                                                                                                                                                                                                                                            |
| xos0055095                         | Summit X770 series switches' port up/down activity can occasionally result in erroneous entries in the Layer 3 tunnel hardware table, causing Layer 3 slowpath traffic. This does not affect Layer 2 configurations, only Layer 3 configurations.                                                                                                                                                                                                                   |
| <b>ACLs</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| xos0056054                         | Disabling user-created mirror instance with ACL filter fails when a default mirror instance is enabled with ACL filter.                                                                                                                                                                                                                                                                                                                                             |
| <b>ESRP</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| xos0056022                         | Topology change in ERPS sub-rings are not notified to the ERPS/EAPS main ring.                                                                                                                                                                                                                                                                                                                                                                                      |
| xos0053647                         | Rebooting after a failover from master to backup works fine, but after performing another failover, the ports in some ESRP member VLANs in slave are unblocked, but ports in ESRP master VLAN are blocked. This creates a situation where ports in ESRP member VLAN are unblocked in both ESRP master and slave, causing traffic loops.                                                                                                                             |

**Table 5: Resolved Issues, Platform-Specific, and Feature Change Requests (CRs)**

| CR Number       | Description                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MLAG</b>     |                                                                                                                                                                                                |
| xos0055257      | After multiple reboots, VRRP instances remain in INIT state when ELSM and VRRP are running over the same single port.                                                                          |
| xos0057384      | Hardware learning is not enabled on the sharing member ports after deleting an MLAG peer.                                                                                                      |
| xos0056020      | L3 traffic ingressing on the ISC link from an MLAG peer is not egressing the appropriate egress MLAG port after L3 forwarding. Occurs only with jumbo frames enabled on a few of the ports.    |
| <b>MPLS</b>     |                                                                                                                                                                                                |
| xos0054052      | Ping doesn't work on VPLS VLANs across pseudowires.                                                                                                                                            |
| xos0055857      | FDB entries are not learned after changing VMAN tag when the VMAN is associated with VPLS.                                                                                                     |
| xos0055866      | Multiple master switch fabric module (MSM) fail-overs cause traffic to stop completely.                                                                                                        |
| xos0055914      | LSP-specific transmit counters incorrectly display a zero value in the output of the command <code>show mpls statistics l2vpn</code> after failover to secondary RSVP path.                    |
| xos0055991      | Traffic is dropped after disabling learning on VPLS service VLAN ports with L2VPN sharing enabled.                                                                                             |
| xos0056114      | Packets are not passing over VPLS when PS tag is configured in the service VLAN.                                                                                                               |
| <b>OpenFlow</b> |                                                                                                                                                                                                |
| xos0055315      | When sending 300 packets to hit the of Default_0 flow, the switch is forwarding 3 packets to the controller through packet In message and floods the rest packets out of other OpenFlow ports. |
| <b>SNMP</b>     |                                                                                                                                                                                                |
| xos0055870      | The command <code>show configuration</code> should reflect deletion of default SNMP communities.                                                                                               |
| <b>VLANs</b>    |                                                                                                                                                                                                |
| xos0056253      | FDB entries are learned despite learning being disabled on ports when port specific tag added to the VLAN.                                                                                     |
| <b>VRRP</b>     |                                                                                                                                                                                                |
| xos0055515      | VRRP backup node is moving to master state despite connectivity between master and backup nodes.                                                                                               |