



# JunosE™ Software for E Series™ Broadband Services Routers

Release Notes

Release

# 11.2.1



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The information in this document is current as of the date listed in the revision history.

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# Release 11.2.1

## Release Installation

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Complete procedures for installing the system software are available in *JunosE System Basics Configuration Guide, Chapter 3, Installing JunosE Software*.

New software releases are available for download from the Juniper Networks website at <http://www.juniper.net/customers/support>. You can use the downloaded image bundle to create your own software CDs.

Before upgrading to a new version of software, save your router's running configuration to a .cnf file or .scr file. If you subsequently need to downgrade for any reason, you can restore the earlier software version.



**Informational Note:** When you upgrade the software on a router that has a large number of interfaces configured, the router might appear to be unresponsive for several minutes. This condition is normal; allow the process to continue uninterrupted.

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### Upgrading to Release 5.3.0 or a Higher-Numbered Release

When you upgrade from a lower-numbered release to Release 5.3.0 or a higher-numbered release, the higher release might not load if you issue the **boot system** command from Boot mode while the lower-numbered software is running on the router or if you insert a flash card running a higher-numbered release into a system running a lower numbered release. However, if you issue the **boot system** command from Global Configuration mode, the new software loads properly.

### Upgrading from Release 5.1.1 or Lower-Numbered Releases to Release 6.x.x or Higher-Numbered Releases

Release 5.1.1 or lower-numbered releases support application images only up to 172 MB. Your software upgrades or application images may be available remotely through Telnet or FTP, or may be delivered on a new NVS card. If you upgrade the JunosE Software using a new NVS card, we recommend you perform the upgrade in two stages: first to an intermediate release and then to the higher-numbered release you want to run. This restriction is not applicable if you upgrade your software remotely through Telnet or FTP.

To install larger application images for Release 6.0.0 and higher-numbered releases, you must first install Release 5.1.2 (or a higher-numbered 5.x.x release). This enables the system to support application images greater than 172 MB. For example, if you are upgrading the software using a new NVS card, you cannot go from Release 5.1.1 to Release 7.2.0 without first upgrading to Release 5.1.2.

See the following table for compatibility of releases.

| JunosE Release                   | Highest Release Able to Load                    | Cannot Load                      | Maximum Application Image |
|----------------------------------|---|----------------------------------|---------------------------|
| 5.1.1 or lower-numbered release  | 5.3.5p0-2 or the highest-numbered 5.x.x release | 6.x.x or higher-numbered release | 172 MB (approximate)      |
| 5.1.2 or higher-numbered release | No limitation                                   | Not applicable                   | 234 MB (approximate)      |
| 7.2.0 or higher-numbered release | No limitation                                   | Not applicable                   | 256 MB (approximate)      |

For more detailed information on installing software, and about NVS cards and SRP modules, see the following documents:

- *JunosE System Basics Configuration Guide, Chapter 6, Managing Modules*
- *Upgrading NVS Cards on SRP Modules in ERX Hardware Guide, Chapter 8, Maintaining ERX Routers*
- *Upgrading NVS Cards on SRP Modules in E120 and E320 Hardware Guide, Chapter 8, Maintaining the Router*

## Moving Line Modules Between Releases

The Juniper Networks ERX1440 Broadband Services Router employs a 40-Gbps SRP module and a new midplane. Release 3.3.2 was the first software release to support the 40-Gbps SRP module and midplane. Before you can transfer a compatible line module from a Juniper Networks ERX705, ERX710, or ERX1410 Broadband Services Router to an ERX1440 router, you must first load Release 3.3.2 or a higher release onto the current router, and then reboot the router to load the release onto the line modules. If you then move any of those line modules to an ERX1440 router, that router is able to recognize the line module.

If you move a compatible line module from an ERX1440 router to an ERX705, ERX710, or ERX1410 router, the module loads properly in the new router regardless of the release.

## SRP Module Memory Requirements

For Release 5.3.0 and higher-numbered software releases on ERX14xx models, ERX7xx models, and the Juniper Networks ERX310 Broadband Services Router, see *ERX Module Guide, Table 1, ERX Module Combinations*, for detailed information about memory requirements.

For Release 8.2.0 and higher-numbered software releases on Juniper Networks E120 and E320 Broadband Services Routers, see *E120 and E320 Module Guide, Table 1, Modules and IOAs*, for detailed information about memory requirements.

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## Hardware and Software Compatibility

For important information about hardware and software, see the document set as follows:

- Combinations of line modules to achieve line rate performance are in *JunosE System Basics Configuration Guide, Chapter 6, Managing Modules*.
- Compatibility of *ERX router modules with software releases* is in *ERX Module Guide, Table 1, ERX Module Combinations*.
- Layer 2 and layer 3 protocols and applications supported by *ERX router modules* are in *ERX Module Guide, Appendix A, Module Protocol Support*.
- Compatibility of E120 router and E320 router modules with software releases is in *E120 and E320 Module Guide, Table 1, Modules and IOAs*.
- Layer 2 and layer 3 protocols and applications supported by IOAs on the E120 router and the E320 router are in *E120 and E320 Module Guide, Appendix A, IOA Protocol Support*.

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- JTAC Policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/customers/support/downloads/710059.pdf>
- Product Warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>
- JTAC Hours of Operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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## Self-Help Online Tools and Resources

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- Find CSC offerings:  
<http://www.juniper.net/customers/support/>
- Search for known bugs:  
<http://www2.juniper.net/kb/>
- Find product documentation:  
<http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base:  
<http://kb.juniper.net/>
- Download the latest versions of software and review release notes:  
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:  
<https://www.juniper.net/alerts/>

- Join and participate in the Juniper Networks Community Forum:  
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Manager:  
<http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool located at  
<https://tools.juniper.net/SerialNumberEntitlementSearch/>

## Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Manager tool in the CSC at  
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<http://www.juniper.net/support/requesting-support.html>

## Release Overview

These *Release Notes* cover Release 11.2.1 of the system software for the Juniper Networks E Series Broadband Services Routers and contain the following sections:

- *Release Highlights* on page 6
- *Early Field Trial Features* on page 9
- *Unsupported Features* on page 10
- *Release Software Protocols* on page 11
- *SRC Software and SDX Software Compatibility Matrix* on page 12
- *Known Behavior* on page 13
- *Known Problems and Limitations* on page 37
- *Resolved Known Problems* on page 53
- *Errata* on page 55
- *Appendix A, System Maximums*, on page 63
- *Appendix B, Applying a ToS Mark to Color-Coded Packets in Aggregate Rate-Limit Hierarchical Policies*, on page 101

If the information in these *Release Notes* differs from the information found in the published documentation set, follow these *Release Notes*.

## Before You Start

These *Release Notes* include information about the changes between Releases 11.2.0 and 11.2.1. Before you use your new software, read these *Release Notes* in their entirety, especially the section *Known Problems and Limitations*. You need the following documentation to fully understand all the features available in Release 11.2.1:

- These 11.2.1 *Release Notes*, which describe changes between Release 11.2.0 and Release 11.2.1
- The 11.2.0 *Release Notes*, which describe features available in Release 11.2.0
- The 11.2.x documentation set, which provides detailed information about features available in Release 11.2.0

The 11.2.x documentation set consists of several manuals and is available only in electronic format. You can print your own documentation using the PDF and HTML formats available at the Juniper Networks Technical Documentation Web site at [www.juniper.net/techpubs](http://www.juniper.net/techpubs). Refer to the following table to help you decide which document to use:

| Task                       | Document   |
|----------------------------|--|
| Install the router         | <i>ERX Hardware Guide</i><br><i>E120 and E320 Hardware Guide</i>   |
| Learn about modules        | <i>ERX Module Guide</i><br><i>E120 and E320 Module Guide</i><br><i>ERX End-of-Life Module Guide</i>                |
| Get up and running quickly | <i>E Series Installation Quick Start poster or ERX Quick Start Guide</i><br><i>E120 and E320 Quick Start Guide</i> |

| Task  | Document   |
|---|--|
| Configure the router  | <i>JunosE System Basics Configuration Guide</i>  |
| Configure physical layer interfaces   | <i>JunosE Physical Layer Configuration Guide</i>   |
| Configure link layer interfaces   | <i>JunosE Link Layer Configuration Guide</i>   |
| Configure line module redundancy, stateful SRP switchover, unified ISSU, VRRP, and interchassis redundancy (ICR)                    | <i>JunosE Service Availability Configuration Guide</i>                                       |
| Configure IP, IPv6 and Neighbor Discovery, and interior gateway protocols (RIP, OSPF, and IS-IS)                                    | <i>JunosE IP, IPv6, and IGP Configuration Guide</i>  |
| Configure IP routing services, including routing policies, NAT, J-Flow statistics, BFD, IPSec, digital certificates, and IP tunnels | <i>JunosE IP Services Configuration Guide</i>  |
| Configure IP multicast routing and IPv6 multicast routing   | <i>JunosE Multicast Routing Configuration Guide</i>  |
| Configure BGP, MPLS, Layer 2 service, and related applications  | <i>JunosE BGP and MPLS Configuration Guide</i>   |
| Configure policy management   | <i>JunosE Policy Management Configuration Guide</i>  |
| Configure quality of service (QoS)  | <i>JunosE Quality of Service Configuration Guide</i>   |
| Configure remote access   | <i>JunosE Broadband Access Configuration Guide</i>   |
| Get specific information about commands   | <i>JunosE Command Reference Guide A to M</i><br><i>JunosE Command Reference Guide N to Z</i> |
| Monitor system events   | <i>JunosE System Event Logging Reference Guide</i>   |
| Look up definitions of terms used in JunosE technical documentation   | <i>JunosE Glossary</i>   |

## Release Highlights

Release 11.2.1 is a maintenance release and includes the features described in this section.

| Category      | Feature  |
|---------------|--|
| <i>DHCP</i>   | <ul style="list-style-type: none"> <li>• <i>Support for RADIUS-Provisioned DHCP Options in DHCP Local Server Standalone Authentication Mode on page 7</i></li> </ul> |
| <i>IPv6</i>   | <ul style="list-style-type: none"> <li>• <i>Support for IPv6 Neighbor Discovery Router Advertisements with Service Modules on ERX Routers on page 8</i></li> </ul>   |
| <i>RADIUS</i> | <ul style="list-style-type: none"> <li>• <i>Inclusion of RADIUS IETF Framed-Route Attribute [22] in RADIUS Accounting Messages on page 8</i></li> </ul>              |

## DHCP

- Support for RADIUS-Provisioned DHCP Options in DHCP Local Server Standalone Authentication Mode

You can now configure DHCP Local Server to receive DHCP options returned by RADIUS server from AAA. DHCP Local Server now includes the DHCP options returned by RADIUS, along with other default or requested DHCP options, in DHCP OFFER and ACK responses. This feature is only supported in DHCP Standalone Authentication Mode.

By default, inclusion of DHCP options returned by RADIUS as part of DHCP OFFER and ACK responses is disabled. To enable DHCP Local Server to include the DHCP options returned by RADIUS, use the **radius-dhcp-options** keyword with the **ip dhcp-local auth include** command. For example:

```
host1(config)# ip dhcp-local auth include radius-dhcp-options
```

DHCP Local Server can support up to 312 bytes of DHCP options data in DHCP packets. While DHCP Local Server gives precedence to DHCP options returned by RADIUS over locally configured DHCP options, inclusion of the DHCP options returned by RADIUS is based on the space available in the DHCP options buffer. As a result, some options may be dropped while the others are included in DHCP OFFER and ACK responses.

The following DHCP options configured from RADIUS are not supported:

- |                                  |   |
|----------------------------------|---|
| - 0 - Pad Option                 | - 67 - Bootfile name                    |
| - 1 - Subnet Mask                | - 77 - User class                       |
| - 13 - Boot File Size Option     | - 80 - Rapid commit                     |
| - 50 - Requested IP Address      | - 81 - client FQDN                      |
| - 51 - IP Address Lease time     | - 90 - Authentication                   |
| - 52 - Option Overload           | - 93 - client system                    |
| - 53 - DHCP Message Type         | - 94 - client NDI                       |
| - 54 - Server Identifier         | - 98 - User Auth                        |
| - 55 - Parameter Request List    | - 116 - Auto Config                     |
| - 56 - Message                   | - 118 - Subnet Selection                |
| - 57 - Maximum DHCP Message Size | - 122 - Code CCC                        |
| - 58 - Renewal Time Value        | - 124 - Vendor Identifying Vendor class |
| - 59 - Rebinding Time Value      | - 125 - Vendor Specific Information     |
| - 60 - Vendor class identifier   | - 128 - TFTP Server IP Address          |
| - 61 - Client-identifier         | - 129 - Call Server IP Address          |
| - 66 - TFTP server name          | - All options beyond 132                |

The following commands have been enhanced to support the inclusion of RADIUS-returned DHCP options as part of OFFER and ACK responses.

- **ip dhcp-local auth include**
- **show ip dhcp-local auth config**

**Change in existing behavior:** Existing feature extended as described here. In lower-numbered releases, DHCP Local Server did not include DHCP options returned from the RADIUS server as part of OFFER and ACK responses. This is no longer the case.

## IPv6

- Support for IPv6 Neighbor Discovery Router Advertisements with Service Modules on ERX Routers

Service line modules and IPSec service modules (collectively referred to as Service Modules) on ERX14xx models, ERX7xx models, and the ERX310 router now support IPv6 Neighbor Discovery router advertisements for dynamically configured interfaces. When a router is configured for IPv6, it uses router advertisements to announce its presence to other nodes connected to it. Hosts discover the addresses of their neighboring routers by listening for these advertisements.

In addition to configuring Neighbor Discovery through the CLI, you can also use IPv6 profiles and RADIUS to configure Neighbor Discovery route advertisements for dynamically configured interfaces. If both an IPv6 profile and RADIUS are configured for Neighbor Discovery router advertisement, the prefix value returned in RADIUS VSA 26-129 takes precedence over the prefix specified in the IPv6 profile configuration.

**Change in existing behavior:** Existing feature extended as described here. In lower-numbered releases, IPv6 Neighbor Discovery was supported only on Fast Ethernet, Gigabit Ethernet, OCx/STMx GE/FE, and OCx/STMx ATM line modules on ERX routers. In this release, ERX routers that contain SMs support IPv6 Neighbor Discovery router advertisements on dynamic interfaces.

## RADIUS

- Inclusion of RADIUS IETF Framed-Route Attribute [22] in RADIUS Accounting Messages

You can now specify that RADIUS accounting messages include the RADIUS IETF Framed-Route attribute [22]. You can use the **radius include** command from Global Configuration mode to configure inclusion of this RADIUS attribute in Acct-Start, Acct-Stop, and Interim-Acct messages. When included in Acct-Stop messages, the attribute is also included in Interim-Acct messages. The attribute is excluded by default from the Acct-Start, Acct-Stop, and Interim-Acct messages.

As a part of this feature, the **framed-route** keyword has been added to the **radius include** command.

The following command has been modified to support this feature:

- **radius include**

The output of the following command has been modified to support this feature:

- **show radius attribute-included**

**Change in existing behavior:** New feature added as described here.

## Early Field Trial Features

The features described in this section are present in the code but have not yet been fully qualified by Juniper Networks. These features are available only for field test purposes in this release. If you use any of these features before they have been fully qualified, it is your responsibility to ensure that the feature operates correctly in your targeted configuration.

### DHCP

- Support for DHCP External Server, DHCP Local Server, DHCP Relay, and DHCP Relay Proxy on POS Access Interfaces

The following packet over SONET (POS) module combinations on E Series routers now support configuration of the DHCP external server, DHCP local server, DHCP relay, and DHCP relay proxy applications, alone or in combination, when the POS module is the access interface:

- POS module combinations on the E120 router and the E320 router:
  - > ES2 4G LM with ES2-S1 OC12-2 STM4 POS IOA
  - > ES2 4G LM with ES2-S1 OC48 STM16 POS IOA
- POS module combinations on ERX14xx models, ERX7xx models, and the ERX310 router:
  - > OCx/STMx POS line module with OC3-4 I/O module
  - > OCx/STMx POS line modules with OC12/STM4 I/O module
  - > OC48 line module with OC48 FRAME APS I/O module

In the current release, this feature is available for early field test purposes only.

You can configure DHCP external server, DHCP local server, DHCP relay, and DHCP relay proxy on these POS modules in either a virtual router (VR) or a VPN routing and forwarding instance (VRF).

As part of this feature, the **pos** keyword has been added to the existing **ip dhcp-local limit** command. To specify the maximum number of IP addresses that the DHCP local server application can supply to all POS access interfaces or to a specific POS access interface, in the range 0–96000, use the **ip dhcp-local limit** command with the new **pos** keyword. For example:

```
! Set the IP address limit for all POS access interfaces to 1000
host1(config)#ip dhcp-local limit pos 1000
! Set the IP address limit for the specified POS access interface to 2000
host1(config)#ip dhcp-local limit interface pos 5/0/0 2000
! Restore the IP address limit for all POS access interfaces to the default value, ! 48000
host1(config)#no ip dhcp-local limit pos
```

To display the maximum number of IP address leases available for POS access interfaces, use the existing **show ip dhcp-local limits** command. For example:

```
host1#show ip dhcp-local limits

*****
          DHCP Local Server Address Limits
ATM Limit      - 48000
VLAN Limit     - 48000
POS Limit      - 1000
Ethernet Limit - 48000
```

## SDX Software and SRC Software

- Transfer of QoS Profile Attachment Information to PDP

JunosE Software now supports sending of the local QoS profile attachment information to the Policy Decision Point (PDP) for a virtual router. To enable this feature, use the **sscc option send-local-qos-profile-config** command in Global Configuration mode.

The following command has been modified in this release:

- **sscc option**

The output of the following command has been modified in this release:

- **show sssc option**

## Unsupported Features

The JunosE Release 11.2.x documentation set describes some features that are present in the code but that have not yet been fully qualified by Juniper Networks. If you use any of these features before they have been fully qualified, it is your responsibility to ensure that the feature operates correctly in your targeted configuration.

The following features are present but unsupported in this release.

### E120 Router and E320 Router

- The ES2 10G LM and ES2 10G Uplink LM do not support layer 2 statistics for VLANs.
- Subscriber Interfaces on the ES2 10G Uplink LM

You can configure dynamic subscriber interfaces and static subscriber interfaces on the ES2 10G Uplink LM using the CLI. However, configuring subscriber interfaces on the ES2 10G Uplink LM provides no benefit because access features such as per-subscriber QoS are unavailable on the module.

### Policy Management

- External Parent Groups Unsupported on ES2 10G, ES2 10G Uplink, and ES2 10G ADV LMs

External parent groups are not supported on the ES2 10G, ES2 10G Uplink, and ES2 10G ADV LMs. If you create a policy that references an external parent group on these LMs, the system prevents you from attaching it to the LM interface and you receive an error message.

### Stateful SRP Switchover (High Availability)

- Stateful SRP Switchover for Certain Applications

The stateful SRP switchover feature has not been qualified for the following applications:

| Remote Access       |
|---------------------|
| – DHCP proxy client |
| – L2TP dialout      |

---

## Release Software Protocols

---

The following list identifies the major software protocols supported in this release. For detailed information about any protocol, see the configuration guides.

### Core Routing Stack

- Internet Protocol (IP) version 4 and version 6
- Transmission Control Protocol (TCP) for IPv4
- User Datagram Protocol (UDP) for IPv4 and IPv6

### Layer 2 Protocols

- Asynchronous Transfer Mode (ATM)
- Bridged Ethernet
- Bridged IP
- Cisco High-Level Data Link Control (Cisco HDLC)
- Ethernet
- Extensible Authentication Protocol (EAP)
- Frame Relay
- Layer 2 Tunneling Protocol (L2TP)
- Multilink Frame Relay (MLFR)
- Multilink Point-to-Point Protocol (MLPPP)
- Packet over SONET (POS)
- Point-to-Point Protocol (PPP)
- PPP over Ethernet (PPPoE)
- Transparent bridging

### Multiprotocol Label Switching (MPLS)

- Border Gateway Protocol (BGP-4)
- Label Distribution Protocol (LDP)
- Resource ReSerVation Protocol – Traffic Engineering Extensions (RSVP-TE)

### Network Management Protocols

- Simple Network Management Protocol (SNMP) versions 1, 2c, and 3

### Routing Protocols

- Border Gateway Protocol (BGP-4)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Internet Group Membership Protocol (IGMP)
- Intermediate System–to–Intermediate System (IS-IS)
- Layer 2 Virtual Private Networks (L2VPNs)
- Mobile IP
- Open Shortest Path First (OSPF) version 2 and version 3

- Protocol Independent Multicast Protocol (PIM), including PIM dense mode, PIM sparse mode, PIM dense-sparse mode, and PIM source-specific multicast
- Routing Information Protocol (RIP) version 2
- Virtual Private LAN Service (VPLS)
- Virtual Router Redundancy Protocol (VRRP)

## Security Protocols

- Internet Key Exchange (IKE)
- Internet Security Association and Key Management Protocol (ISAKMP)
- IP Authentication Header (AH)
- IP Encapsulating Security Payload (ESP)
- Network Address Translation (NAT)

## SRC Software and SDX Software Compatibility Matrix

The SRC software offers the features of the SDX software on the C Series Controllers, a range of hardware platforms that use the Linux operating system. In contrast, the SDX software runs on Solaris workstations. The SRC software contains the features found in the associated SDX release plus additional features described in the *SRC Release Notes*.

The following table shows which versions of the SRC software and SDX software are compatible with specified versions of the JunosE Software.

| SRC Software Release | SDX Software Release | Tested with JunosE Release |
|----------------------|----------------------|----------------------------|
| 2.0.0                | 7.1.0                | 8.1.2, 8.2.2               |
| 2.1.0                | Not applicable       | 9.1.0p0-1                  |
| 3.0.0                | Not applicable       | 9.0.0, 9.0.1, 9.1.1        |
| 3.1.0                | Not applicable       | 9.2.0, 9.3.0, 10.0.0       |
| 3.2.0                | Not applicable       | 10.1.1, 10.2.1             |
| 4.0.0                | Not applicable       | 10.3.0, 11.0.0, 11.1.0     |

For more detailed information about SRC software and SDX software compatibility with JunosE releases, see the *SRC Release Notes*.

## Known Behavior

This section briefly describes E Series router behavior and related issues. In some cases the behavior differs from non-E Series implementations; in others the behavior is included to emphasize how the router works.

### AAA

- Although you can use the **max-sessions** command to configure a maximum of 32,000 outstanding authentication/authorization requests to a RADIUS server, AAA internal limits prevent the actual number of outstanding authentication/authorization requests from exceeding 9600. These internal AAA limits apply only to authentication/authorization requests and not to accounting requests.
- The JunosE Software does not support accounting for ATM 1483 subscribers. The **atm1483** keyword for the **aaa accounting default** command is present in the CLI, but it is not supported.

### ATM

- You cannot configure connection admission control (CAC) on an ATM interface on which you have created a bulk-configured virtual circuit (VC) range for use by a dynamic ATM 1483 subinterface. Conversely, you cannot create a bulk-configured VC range on an ATM interface on which you have configured CAC. The router rejects these configurations, which causes them to fail.

Configuring CAC and bulk-configured VCs on the same ATM interface was supported in previous JunosE Software releases. As a result, if you are upgrading to the current JunosE release from a lower-numbered release, configurations that use CAC and bulk configuration on the same ATM interface continue to work. However, we recommend that you disable CAC on these ATM interfaces to ensure continued compatibility with future JunosE releases.

- When you perform an `snmpWalk` on the `juniAtmSubIfVccTable`, a response is received for only a few of the total configured ATM subinterfaces when both of the following are true: the router has a line module that has some ATM-related configuration and the line module is in the disabled state. [Defect ID 80020]
- The ATM peak cell rate (PCR) does not appear in the L2TP Calling Number AVP for the first PPP session when the ATM shaping parameters were configured by RADIUS return attributes. [Defect ID 60933]
- When you reload an ATM line module that is configured with NBMA circuits as passive OSPF interfaces and that has established OSPF adjacencies and IBGP peers (configured on Gigabit Ethernet interfaces), the transmission of OSPF hello packets might be affected until all the NBMA interfaces have initialized. [Defect ID 46157]

**Work-around:** Either remove the passive OSPF interface statements on the NBMA interfaces, or statically configure the OSPF cost on the NBMA interfaces.

- When you configure an ATM PVC where PCR = SCR and maximum burst size is zero, the CLI returns an error indicating the burst size is invalid and it does not create the VC. [Defect ID 58357]

**Work-around:** Configure a CBR or a UBR plus PCR to create the circuit with the same parameters, depending on the desired priority for the traffic. CBR has a high priority and UBR plus PCR has a medium priority.

- When you use the **no-authenticate** keyword with the **subscriber** command to prevent subscriber authentication so that the subscriber information can be used for DHCP option 82, suboption 2, the SRP module can reset. This issue does not occur when you use the **no-authenticate** keyword with the **subscriber** command as a way to perform a RADIUS configuration. [Defect ID 69865]

## BGP

- The E Series router does not include the link-local IPv6 address in the next-hop field of an MP-BGP update message carrying IPv6 routing information over IPv4 transport. This behavior is compliant with RFC 2545 but might have interoperability issues with other implementations that depend on a link-local IPv6 address in the next-hop field on a directly connected external BGP peering.

**Work-around:** Enable EBGP multihop configuration on the remote (non-Juniper Networks) peer.

- The following message might be displayed under certain conditions:

**bgpConnections (default,0.0.0.0): TCP error code xx (...) occurred while accepting inbound TCP connection**

The message is generated when an unconfigured peer attempts to establish a TCP session with an E Series router and a valid route to the source address of the peer is absent from the router's routing table.

If a valid route exists in the routing table, the following message is displayed when an unconfigured peer attempts to establish a TCP session with an E Series router; X.X.X.X is the source address of the unconfigured peer:

**NOTICE 08/29/2001 16:50:11 bgpConnections (default,X.X.X.X): Inbound connection refused - no peer X.X.X.X configured in core**

## BGP/MPLS VPNs

- In a scaled environment, we recommend that you increase the hold timers for the following protocols to appropriate values, based on the level of complexity of the network and scaling settings, so as to enable graceful restart to be completed successfully. [Defect ID 184974]

- BGP
- IS-IS
- LDP
- OSPF
- RSVP

For a sample configuration scenario that illustrates how to configure hold timers for successful graceful restart in a scaled environment, see *JunosE BGP and MPLS Configuration Guide, Chapter 1, Configuring BGP Routing*.

- NAT does not function properly with secondary routing table lookup (fallback global) or global export mapping on the VRF.

## B-RAS

- Pool groups are not supported; although the **ip local pool group** command appears in the CLI, it is not supported.
- If the router is under a heavy load, the **show profile** command might take longer than usual to execute.

**Work-around:** You can either delay examination of profiles until the router is less busy, or save a copy of the profile to a text file off the router.

## Bridged Ethernet

- The CLI erroneously permits you to configure **bridge1483** encapsulation over AAL5MUX IP even though that configuration is not supported. [Defect ID 35013]

## CLI

- In Interface Configuration mode for a major interface, the CLI displays options for protocols that are not supported by that interface type.
- When you issue the **reload** command on an ERX310 router, the command might display a warning message that erroneously indicates that a synchronizing operation will be performed. Any references to synchronization that appear in command output or system messages do not apply to the ERX310 router, which does not support SRP module redundancy.
- The following commands have been deprecated in the JunosE Software and might be removed completely in a future release. If a command has been deprecated for only a particular command mode, the table specifies any modes for which it is still available.

| Deprecated Command                  | Command Mode   | Preferred Command   |
|-------------------------------------|--|---|
| aaa accounting interval             | Global Configuration   | aaa service accounting interval and<br>aaa user accounting interval |
| cablelength short                   | Controller Configuration   |   |
| clock rate                          | Interface Configuration  |   |
| channel-group description           | Controller Configuration   |   |
| channel-group shutdown              | Controller Configuration   |   |
| channel-group snmp trap link-status | Controller Configuration   |   |
| channel-group timeslots             | Controller Configuration   |   |
| classifier-list                     | Global Configuration   | ip classifier-list  |
| color                               | Policy List Configuration  | color in Classifier Group Configuration mode                        |
| controller e1                       | Global Configuration   |   |
| controller t1                       | Global Configuration   |   |
| description                         | Interface Configuration<br>Still available in Controller Configuration and VRF Configuration modes | ip description  |
| fdl                                 | Controller Configuration   |   |
| fdl carrier                         | Controller Configuration   |   |
| fdl string                          | Controller Configuration   |   |
| fdl transmit                        | Controller Configuration   |   |

| Deprecated Command   | Command Mode  | Preferred Command   |
|--|---|---|
| filter   | Policy List Configuration   | filter in Classifier Group Configuration mode   |
| forward next-hop   | Policy List Configuration   | forward next-hop in Classifier Group Configuration mode   |
| forward next-interface   | Policy List Configuration   | forward interface in Classifier Group Configuration mode  |
| hostname   | Domain Map Tunnel Configuration<br>Still available in Global Configuration mode                           | client-name   |
| hssi description   | Interface Configuration   |   |
| hssi force dte acknowledge   | Interface Configuration   |   |
| hssi internal-clock  | Interface Configuration   |   |
| ignore dcd   | Interface Configuration   |   |
| ignore link-state-signals  | Interface Configuration   |   |
| [ no ] ike crt   | Global Configuration  | [ no ] ipsec crt  |
| interface hssi   | Global Configuration  |   |
| invert tx clock  | Global Configuration  |   |
| ip dhcp-local cable-modem  | Global Configuration  | set dhcp-relay with the strings docsis and pktc in the server-string mapping specification  |
| ip mirror  | Global Configuration  | ip policy secure-input and ip policy secure-output; for E120 and E320 routers, you must use these commands because the ip mirror command has been removed from the CLI for those routers. |
| ip policy local-input  | Interface Configuration, Profile Configuration  | None  |
| [ no ] ipsec isakmp-policy rule  | Global Configuration  | [ no ] ipsec ike-policy-rule  |
| ipv6 policy local-input  | Interface Configuration, Profile Configuration  | None  |
| j1   | Controller Configuration  |   |
| license l2tp-session   | Global Configuration  | None  |
| lineCoding   | Controller Configuration  |   |
| log  | Policy List Configuration   | log in Classifier Group Configuration mode  |
| log severity debug dhcpLocalProtocolDecode   | Global Configuration  | log severity debug dhcpCapture  |
| loopback   | Domain Map Configuration<br>Still available in Controller Configuration and Interface Configuration modes | local-interface   |
| loopback remote { remote line fdl ansi   remote line fdl bellcore   remote line inband remote payload [ fdl ] [ ansi ] } | Controller Configuration  |   |

| Deprecated Command                     | Command Mode  | Preferred Command   |
|--|---|---|
| mark                                   | Policy List Configuration   | mark in Classifier Group Configuration mode   |
| mark-de                                | Policy List Configuration   | mark-de in Classifier Group Configuration mode  |
| mark-exp                               | Policy List Configuration   | mark-exp in Classifier Group Configuration mode   |
| mark-user-priority                     | Policy List Configuration   | mark-user-priority in Classifier Group Configuration mode   |
| mpls ldp discovery transport-address   | Interface Configuration   | This command has no effect in Interface Configuration mode. Now available in Global Configuration mode. |
| mpls topology-driven-lsp ip-interfaces | Global Configuration  | ldp ip-forwarding   |
| [ no ] next-hop                        | Policy List Configuration   | forward next-hop in Classifier Group Configuration mode   |
| [ no ] next-interface                  | Policy List Configuration   | forward interface in Classifier Group Configuration mode  |
| nrzi-encoding                          | Interface Configuration   |   |
| no ospf enable                         | Router Configuration  | ospf shutdown   |
| policy-list                            | Global Configuration  | ip policy-list  |
| radius disconnect client               | Global Configuration<br>The RADIUS Disconnect Configuration mode has been removed from the CLI. | subscriber disconnect   |
| rate-limit-profile                     | Policy List Configuration   | rate-limit-profile in Classifier Group Configuration mode   |
| remote-loopback                        | Controller Configuration  |   |
| router-name                            | Domain Map Configuration<br>Still available in Tunnel Group Tunnel Configuration mode           | auth-router-name and ip-router-name in Domain Map Configuration mode                                    |
| show controllers t1/e1                 | User Exec, Privileged Exec  |   |
| show controllers t1 remote             | User Exec, Privileged Exec  |   |
| show ike certificates                  | User Exec, Privileged Exec  | show ipsec certificates   |
| show ike configuration                 | User Exec, Privileged Exec  | show ipsec ike-configuration  |
| show ike identity                      | User Exec, Privileged Exec  | show ipsec identity   |
| show ike policy-rule                   | User Exec, Privileged Exec  | show ipsec ike-policy-rule  |
| show ike sa                            | User Exec, Privileged Exec  | show ipsec ike-sa   |
| show ip dhcp-external binding          | Privileged Exec   | show dhcp binding   |
| show ip dhcp-external binding-id       | Privileged Exec   | show dhcp binding   |
| show ip dhcp-local binding             | Privileged Exec   | show dhcp binding   |
| show ip dynamic-interface-prefix       | Privileged Exec, User Exec  | None  |
| show ip mirror interface               | Privileged Exec   | show secure policy-list   |
| show license l2tp-session              | User Exec, Privileged Exec  | None  |
| t1 lineCoding                          | Controller Configuration  | None. This command never had any effect.  |
| traffic-class                          | Policy List Configuration   | traffic-class in Classifier Group Configuration mode  |

| Deprecated Command                 | Command Mode  | Preferred Command  |
|------------------------------------|---|--|
| tunnel mpls label-dist             | Interface Configuration,<br>Tunnel Profile Configuration  | None   |
| tunnel mpls autoroute announce bgp | Interface Configuration,<br>Tunnel Profile Configuration  | None   |
| unframed                           | Controller Configuration  |  |
| user-packet-class                  | Policy List Configuration   | user-packet-class in Classifier<br>Group Configuration mode                |
| virtual-router                     | Domain Map Configuration<br>Still available in Privileged<br>Exec and Global Configuration<br>modes | auth-router-name and<br>ip-router-name in Domain<br>Map Configuration mode |
| yellow                             | Controller Configuration  |  |

The router displays a notice when you issue the command manually. If the command is in a script, the router automatically maps the deprecated command to the preferred command. If the deprecated command no longer has a function, then that command has no effect when you run a script containing the command.

- The **show configuration** command normally takes a long time to finish for extremely large configurations. If you specify a search string (with the **begin**, **exclude**, or **include** options) with the command for a string that is not present in the configuration, then the CLI session appears to be busy for a prolonged period. The CLI filtering feature for **show** commands does not speed up execution of the command.

## DHCP

- Configuring authentication on the DHCP local server requires that you first disable the DHCP local server for standalone mode. Doing so removes your entire DHCP local server configuration. Therefore, if you want to configure authentication, do so before you have otherwise configured the DHCP local server.
- When you upgrade from a release numbered lower than Release 7.1.0, all DHCP host routes previously stored in NVS are deleted. After the upgrade, DHCP clients must reacquire their IP addresses, which results in the new host routes being correctly stored in NVS.

## DHCP External Server

- When a bound DHCP client on a dynamic subscriber interface extends its IP address lease by restarting the DHCP discovery process on its primary IP interface instead of by initiating the DHCP renewal process on its dynamic subscriber interface, the default behavior of the DHCP external server application to preserve the client's dynamic subscriber interface was changed in the following JunosE releases to delete and re-create the client's dynamic subscriber interface:
  - Release 7.2.4p0-4 and all higher-numbered 7.2.x releases and patch releases
  - Release 7.3.4 and all higher-numbered 7.3.x releases and patch releases
  - Release 8.0.4 and all higher-numbered 8.0.x releases and patch releases
  - Release 8.1.2 and all higher-numbered 8.1.x releases and patch releases
  - Release 8.2.3 and all 8.2.3 patch releases
  - Release 9.0.0 and all 9.0.0 patch releases

- Release 9.0.1 and all 9.0.1 patch releases
- Release 9.1.0 and all 9.1.0 patch releases

If you are upgrading the JunosE Software on the router from any of these releases, you must explicitly issue the **ip dhcp-external recreate-subscriber-interface** command to configure the router to continue to delete and re-create the DHCP client's dynamic subscriber interface.



**Informational Note:** The DHCP external server application is unsupported in JunosE Release 8.2.1 and JunosE Release 8.2.2.

- DHCP external server may not be able to bind all DHCP clients when all of the following conditions exist:
  - DHCP external server and either DHCP relay or relay proxy are configured in separate virtual routers on an E320 router.
  - The client-facing and server-facing interfaces for DHCP external server and either DHCP relay or relay proxy are configured on the same ES2 4G LM.
  - DHCP external server is configured to create dynamic subscriber interfaces.

When these three conditions exist simultaneously, the ES2 4G LM may not be able to successfully process all DHCP packets. Although all clients may get bounded in DHCP relay or relay proxy, some clients may not get bounded in DHCP external server. (In a production environment it is highly unlikely for conditions 1 and 2 to exist because stand-alone DHCP external server is normally configured for a DHCP relay in a different chassis.)

**Work-around:** You can eliminate this issue by modifying any one of these conditions. For example, this issue does not exist with any of the following configuration modifications:

- Configure DHCP external server and either DHCP relay or relay proxy in the same virtual router.
- Configure the client-facing and server-facing interfaces for DHCP external server and either DHCP relay or relay proxy on the same ES2 10G LM instead of the same ES2 4G LM.
- Configure the client-facing and server-facing interfaces for DHCP external server and either DHCP relay or relay proxy on separate ES2 4G LMs.
- If you are using DHCP external server and a burst of client releases occurs during a unified ISSU, some of the client releases might not be processed. [Defect ID 180178]
- When the DHCP relay agent application and the DHCP external server application are configured in the same virtual router, using the **ip dhcp-external server-sync** command on an unnumbered IP interface does not function as expected. When you issue the **ip dhcp-external server-sync** command in this configuration to create subscriber state information based on lease renewals when the external DHCP server and the router are unsynchronized, the router does not forward the ACK request from the DHCP server to the client because there is no route. [Defect ID 88562]

- DHCP NAK packets are sent from a different VLAN than the one on which the renew request is received on a router that is configured with dynamic VLANs, DHCP local server, and automatically created dynamic subscriber interfaces. This behavior occurs only after a link flap has taken place. [Defect ID 87062]

## Dynamic Interfaces

- Dynamic IPv6 interfaces over static PPP interfaces are not supported.

## Ethernet

- The hashing algorithm that selects the LAG member link is associated with the IP address of the subscriber client to support QoS. Consequently, a particular flow is always hashed to the same link. When a member link is removed from a LAG bundle, traffic rate is disrupted and traffic flow is reduced. When the link goes down and then comes back up, the traffic flow is automatically redistributed.
- When counting bits per second on a Fast Ethernet or Gigabit Ethernet interface, an E Series router includes 12 bytes for interpacket gap, 7 bytes for preamble, and 1 byte for start frame delimiter, for a total of 20 bytes (160 bits) per packet more than some non-E Series routers. This value therefore shows the total bandwidth utilization on the interface, including both data and overhead.
- To bridge unicast known-DA packets at line rate on both 2-Gbps ports of the GE-2 line module or the GE-HDE module when paired with the GE-2 SFP I/O module, the minimum packet size must be at least 144 bytes.

When installed in the ERX1440 router, the GE-2 module delivers full bandwidth of 4 GB per line module (2 GB at the ingress and 2 GB at the egress) only when installed in slot 2 or slot 4, and when the SRP-40G+ module is used in the router. When installed in any other ERX1440 slot, the GE-2 module delivers a maximum bandwidth of 2 GB per line module (1 GB maximum at the ingress and 1 GB maximum at the egress). Therefore, of the maximum 24 possible ports for the module in an ERX1440 chassis (that is, two ports in each of 12 slots), full bandwidth is delivered only on a maximum of four ports (those in slots 2 and 4).

When installed in the ERX1440 router, the GE-HDE line module delivers full bandwidth of 4 GB per line module (2 GB at the ingress and 2 GB at the egress) only when installed in slot 2 or slot 4, and when the SRP-40G+ module is used in the router. When installed in any other ERX1440 slot, the GE-HDE module delivers a maximum bandwidth of 2 GB per line module (1 GB maximum at the ingress and 1 GB maximum at the egress). Therefore, of the maximum 96 possible ports for the module in an ERX1440 chassis (that is, 8 ports in each of 12 slots), full bandwidth is delivered only on a maximum of 16 ports (those in slots 2 and 4).

When the GE-2 line module or the GE-HDE line module is installed in either the ERX1440 router or the ERX310 router and both ports are active, line rate performance is achieved only with packets that are 174 bytes or larger. The line module might not achieve line rate with packets that are smaller than 174 bytes.

- Support for the 0x9200 S-VLAN Ethertype has been removed. You can no longer specify the **9200** option with the **svlan ethertype** command.

When you upgrade to Release 7.1.0 or higher-numbered release, the software automatically transfers existing configurations that use the 0x9200 Ethertype to the 0x88a8 Ethertype.

- The **show interface gigabitEthernet** command output does not display the following line of output for Gigabit Ethernet modules that do not support SFPs, such as the GE Single Mode I/O module and GE I/O Multi Mode I/O modules:

```
Primary/Secondary link signal detected
Primary/Secondary link signal not detected
```

## Flash

- Flash cards manufactured by Wintec are present on some currently deployed routers. When you upgrade the JunosE Software on such routers, the firmware on the flash card controller is automatically updated during diagnostics. During this reboot, the software runs an integrity check on the file system to verify that the firmware update did not corrupt the contents of the flash card. This integrity check is an expected side effect of the enhanced firmware available in this release. The integrity check does not indicate a problem with the flash card or its contents.

## Forwarding

- VPLS forwarding does not function properly when any of the following conditions occur: [Defect ID 79856]
  - MLPPP interfaces are used
  - L2TP is used with sequence numbers enabled
  - GRE is used with sequence numbers enabled
- A memory leak of about two percent can occur on the ES2 10G LM and result in a module reset when a large number of successive SRP switchovers take place with active DHCP clients. [Defect ID 86245]

## GRE

- When you shut down the only outgoing IP interface to the IP destinations of GRE/IP tunnels, the tunnels remain in the up state rather than transitioning to down. As a consequence, all IP routes that use these tunnels as next hops also remain in the routing table.

## Hardware

- SRP modules with only 1 GB of memory do not work reliably in ERX7xx and ERX14xx routers running JunosE Release 8.1.0 or higher, and may experience system resets due to an out of memory condition. However, the ERX310 router still supports 1 GB of memory in the SRP-SE10 module.

**Work-around:** Upgrade your SRP module memory to 2 GB for all ERX7xx and ERX14xx routers running JunosE Release 8.1.0 or higher.

- There is a very small chance that some line modules can have an improperly modified keying block that prevents the module from proper seating in the top slot of an older ERX7xx chassis or a preproduction ERX310 chassis. For example, this problem has been observed for an OCx/STMx module in slot 2 of an early-test ERX310 chassis.

**Work-around:** Remove the keying block to insert the module into the top slot, or insert the module into a different slot.

- Do not include a **not protocol** clause in any classifier control list for policies attached to an interface on an ES2 10G Uplink LM. The **not protocol** functionality is not available for this module.

- The ES2 10G LM and the ES2 10G Uplink LM do not support VLAN statistics in the current release.
- PCMCIA NVS Card Caution



**Caution:** Before you insert or remove PCMCIA NVS (flash) cards from a running router, we strongly recommend that you halt the SRP module or shut down the router. Failure to do this can result in file corruption in one or both cards.

- The 4XOC3 APS MULTIMODE and 4XOC3 APS SINGLE MODE I/O modules are incompatible with the following versions of the OCx/STMx ATM and OCx/STMx POS line modules:
  - OCx/STMx ATM line modules with assembly numbers 350-00039-xx, 350-80039-xx, and 350-90039-xx
  - OCx/STMx POS line modules with assembly number 350-10039-xx
- When you configure 1:5 line module redundancy by using either the 4XOC3 APS MULTIMODE or 4XOC3 APS SINGLE MODE I/O module, the spare R-Mid OCX I/O module you install must have assembly number 350-00094-01 Rev. A01 or later. Spare R-Mid OCX I/O modules with an earlier assembly number are not supported for 1:5 redundancy configurations that use either the 4XOC3 APS MULTIMODE or 4XOC3 APS SINGLE MODE I/O module.

## HDLC

- By design, on the cOC12/STM4 module you cannot delete a serial interface while data for the interface is still enqueued. The enqueued data can drain only when the interface is operationally up. Therefore you must ensure that the interface is operationally up before you delete it. For example, if you have issued the **shutdown** command for the interface before you try to delete the interface, issue the **no shutdown** command, then delete the interface.

## IP

- If you enable detection of duplicate IPv6 prefixes using the **aaa duplicate-prefix-check** command, and bring up a subscriber in a dual-stack network (in which both IPv4 and IPv6 subscribers are present) over a static PPP interface for which IPv6 prefix is configured for IPv6 Neighbor Discovery router advertisements (using the **ipv6 nd prefix-advertisement ipv6Prefix** command), the subscriber session is successfully brought up. When you attempt to bring up another subscriber over a different interface on the same virtual router as the one used for the first subscriber, and for which the `Ipv6-NdRa-Prefix` (VSA 26-129) returned from the RADIUS server in the Access-Accept message is the same IPv6 prefix as the statically configured value for the first subscriber, the second subscriber session is also brought up and not disconnected as expected.

In such a scenario, the duplicate IPv6 prefix detection functionality does not cause the second subscriber session, which uses the same IPv6 prefix as the first subscriber session, to be rejected. Also, a new IPv6 route is installed for the second subscriber as a duplicate access-internal route. [Defect ID 187264]

- When you upgrade from certain releases to JunosE Release 9.2.0p1-0 or higher-numbered releases, descriptions configured for IP interfaces or IP subinterfaces are not retained across the upgrade when the descriptions are shorter than 9 characters in length. Additionally, VRF descriptions are not retained across the upgrade when the combined length of the VRF description and the VRF name is shorter than 9 characters. This behavior is seen during upgrades using a reload, stateful SRP switchover, or unified ISSU. Upgrades from the following releases are affected by this behavior:
  - 7.x.x
  - 8.0.x
  - 8.1.x, 8.2.x, and 9.x.x builds created before July 23, 2008

Examples of descriptions that are not retained across the upgrade:

```
host1(config-if)#ip description 12345678
```

```
host1(config)#ip vrf 123
host1(config-vrf)#description 45678
```

Examples of descriptions that are retained across the upgrade:

```
host1(config-if)#ip description longdescription
```

```
host1(config)#ip vrf longname
host1(config-vrf)#description 45678
```

```
host1(config)#ip vrf 123
host1(config-vrf)#description longdescription
```

**Work-around:** Before you upgrade from an affected release to JunosE Release 9.2.0p1-0 or higher-numbered releases, ensure that you do the following:

- Change IP interface and subinterface descriptions to 9 or more characters.
- Change VRF descriptions, VRF names, or both so that the combination of associated VRF names and descriptions consists of 9 or more characters.
- The **ip tcp adjust-mss** command, which modifies the maximum segment size for TCP SYN packets traveling through the interface, is not supported on the ES2 10G LM or ES2 10G Uplink LM.
- If you have enabled ipInterface logging at a priority of debug, the acknowledgment that an interface has been deleted from the line modules can return to the SRP module after the layers beneath IP have deleted their interfaces. Consequently, the original name of the interface cannot be resolved or displayed in the log, and the system instead displays the ifIndex of the IP interface. This behavior has no functional effect other than that the log is misleading. However, previous log events indicate that the interface deletion was beginning.
- When you want to use a configuration script to configure IP shared interfaces that reference a physical interface, you must issue the **service show configuration format 2** command before you generate the script. If the default **show configuration format 1** (format 1) is enabled instead, the generated script cannot properly configure the IP shared interfaces because they are created before the physical interfaces. To properly configure the shared interfaces in this event, run the generated format 1 script twice.

- When you issue the **show ip forwarding-table** command for a particular slot, it is normal and appropriate behavior when the Status field indicates Valid while the Load Errors field is increasing daily for that VR. The Load Errors field records any failed routing table distribution attempt as an error. Attempts can fail for many reasons during normal operation; a failed attempt does not necessarily indicate a problem. It is normal to see many load errors per day. If the Status field indicates Invalid, then the routing table distribution has failed constantly for that VR and a real problem exists. You might occasionally see a status of Updating. However, if the Status field always indicates Updating, then again the routing table distribution has failed constantly for that VR, and a real problem exists.
  - The enhancement to the CLI to support unnumbered reference to any kind of interface rather than just loopback interfaces has consequences such as the following: [Defect ID 47743]
    - If the references to shared interfaces appear in the **show configuration** output before the configuration for the interfaces they refer to, trying to restore such a configuration with a script generated from **show configuration** generates errors like the following:
 

```
% Error, line 3929:
host1(config-if)#ip share-interface FastEthernet 3/0.2
% No such interface
```
    - Unnumbered interfaces that refer to nonloopback interfaces (for example, **ip unnumbered fastEthernet 3/0.2**) and that appear in the **show configuration** output before the interface referred to might generate similar no such interface errors.
- Work-around:** Run the script twice.
- IP interface statistics become inconsistent when a slot is reset, because some traffic (such as control traffic) might be destined for the SRP module and is therefore counted elsewhere. [Defect ID 26697]

## IPSec

- When you shut down the only outgoing IP interface to the IP destinations of IPSec tunnels, the tunnels remain in the up state rather than transitioning to down. As a consequence, all IP routes that use these tunnels as next hops also remain in the routing table. You can use dead keepalive detection (DPD) to avoid this situation. DPD must be active, which requires both IPSec tunnel endpoints to support DPD.
- During a warm restart after a system failover, the SRP module can take several minutes to resume the normal exchange of UDP/IP packets to applications. During this restart time, the E Series router does not send or receive dead peer detection (DPD) keepalives, which are used to verify connectivity between the router and its peers. The length of the restart time depends on the number of interfaces—if the restart time is too long, remote peers might determine that the connection from them to the E Series router is broken and then shut down an IPSec tunnel that has DPD enabled. In the worst case, all IPSec tunnels might be shut down. [Defect ID 65132]
- When the LAC-to-LNS data path runs over an MPLS tunnel and the MPLS tunnel originates or terminates at the LAC on an ES2 10G LM or an ES2 10G Uplink LM, the L2TP data traffic that originated or terminated at the LAC is discarded. [Defect ID 87260]

## IS-IS

- When IS-IS is configured on a static PPP interface, the IS-IS neighbor does not come up if you remove the IP address from the interface and then add the IP address back to the interface.

**Work-around:** When you remove and add back the IP address, you must also remove the IS-IS configuration from the interface and then add the configuration back to the interface by issuing the **no router isis** and **router isis** commands.

- When you run IS-IS on back-to-back virtual routers (VRs) in an IS-IS-over-bridged-Ethernet configuration and do not configure different IS-IS priority levels on each VR, a situation can occur in which both VRs elect themselves as the designated intermediate system (DIS) for the same network segment.

This situation occurs because the router uses the same MAC address on all bridged Ethernet interfaces by default. When both VRs have the same (that is, the default) IS-IS priority level, the router must use the MAC address assigned to each interface to determine which router becomes the DIS. Because each interface in an IS-IS-over-bridged-Ethernet configuration uses the same MAC address, however, the router cannot properly designate the DIS for the network segment. As a result, both VRs elect themselves as the DIS for the same network segment, and the configuration fails. [Defect ID 72367]

**Work-around:** To ensure proper election of the DIS when you configure IS-IS over bridged Ethernet for back-to-back VRs, we recommend that you use the **isis network point-to-point** command in Interface Configuration mode to configure IS-IS to operate using point-to-point (P2P) connections on a broadcast circuit when only two routers (or, in this case, two VRs) are on the circuit. Issuing this command tears down the current existing IS-IS adjacency in that link and reestablishes a new adjacency.

- If you perform a stateful SRP switchover operation on a router with IS-IS previously configured on the device, the IS-IS application takes longer than the normal duration (approximately 40 seconds) to restart after the switchover is completed. The time that it takes for IS-IS to restart after a stateful switchover causes a large delay in the transmission of hello packets with restart TLV (type 211) from the restarting router to neighboring routers. Because of the delay in transmission of hello packets to neighboring routers, active adjacencies are not maintained between the restarting router and other routers in the IS-IS domain. To avoid adjacencies being reset, we recommend that you increase the hold timers for the IS-IS protocol to appropriate values, based on the level of complexity of the network and configuration settings, so as to enable IS-IS graceful restart to be completed successfully. [Defect ID 90546]

The long duration for restart of a previously running application on the router also occurs if you configured OSPF on the router and perform a stateful SRP switchover process. This condition can occur even in environments that are not scaled to the maximum limits and contain minimal subscriber connections or attribute definitions.

Because the IP application takes about 30-35 seconds to reinitialize and process control packets after a stateful SRP switchover, and the continual increase in the time needed for completion of IP reinitialization in JunosE releases (owing to consumption of system resources for enhanced functionalities), we recommend that you increase the hold timers for the associated protocols running on the router to necessary levels so that graceful restart can function properly.

## L2TP

- L2TP peer resynchronization enables an L2TP failed endpoint to resynchronize with its peer non-failed endpoint. The JunosE Software supports failover protocol and silent failover peer resynchronization methods. If you configure the silent failover method, you must keep the following considerations in mind:
  - PPP keepalives—To ensure resynchronization of the session database, PPP keepalives must be enabled on the L2TP data path. Without PPP keepalives, silent failover might disconnect an established session if there is no user traffic during failover recovery.
  - Asymmetric routes on different line modules—Asymmetric routes whose receive and transmit paths use I/O paths on different line modules can result in improperly handled line module control packets. If your network does include this type of asymmetric route, tunnels using these routes might fail to recover properly.
- NAT dynamic translation generation affects the LNS session creation time. When NAT dynamic translations and LNS sessions are created simultaneously, NAT dominates the CPU cycles of the tunnel-service module, resulting in a delay in the LNS session creation rate. The LNS session creation rate returns to its normal rate when NAT dynamic translations are no longer being generated. [Defect ID 53191]

**Work-around:** When signaling performance must be optimal, avoid the simultaneous configuration of NAT and LNS.

- If you create an L2TP destination profile `profileName`, establish tunnels with the profile, and then remove the profile, you cannot subsequently create another destination profile using that same `profileName` until all the tunnels drain from the previous instance of this destination profile. If you do not wait, the E Series router displays a message similar to the following:

```
l2tp: Discarding incoming sccrp from vr default, remote address 192.168.100.1 - no destination profile.
```

If you do not want to wait for the tunnels to drain, use a different name for the destination profile. [Defect ID 32973]

## Line Module Redundancy

- On E120 routers and E320 routers, redundant IOAs have a temperature sensor, and the **show environment all** command lists the temperature of IOAs in their associated slots.

On ERX routers, redundant I/O modules do not have a temperature sensor.

Therefore, the **show environment all** command output lists the primary I/O module temperature in the slot of the line module that is responsible for the I/O module.

- When you install an ES2-S1 Redundancy IOA with a hardware revision number of -02 or less in slot 0 or slot 11 of the E320 router or in slot 0 or the E120 router, do not install an OCx/STMx ATM IOA or an OCx/STMx POS IOA in the lower (E320) or left (E120) adapter bay of slot 1 or slot 12. When the spare line module is controlling another slot and you revert back to the primary line module, the ATM or POS IOAs can become unusable or cause the line module to reset. [Defect ID 69760]

**Work-around:** This problem is not present for ES2-S1 Redundancy IOAs with a hardware revision number of -03 or higher.

## MLPPP

- Do not configure both MLPPP fragmentation (with the **ppp fragmentation** command) and IP fragmentation of L2TP packets (with the **ip mtu** command) on the same interface. Instead, you must choose only one of the fragmentation configurations by setting it to the necessary value and set the other fragmentation configuration to the maximum allowable value.

## MPLS

- Martini circuits configured on the ES2 10G LM act as true layer 2 tunnels, without modifying the layer 2 headers. For this reason, Martini VLAN retagging is not currently supported.
- If you are upgrading to Release 7.1.0 or a higher-numbered release from a release numbered lower than Release 7.1.0, and have inter-AS option B or C configurations, you must explicitly configure MPLS on all inter-AS links, as in the following example:

```
host1#configure terminal
host1(config)#interface fastEthernet 2/0
host1(config-if)#ip address ...
host1(config-if)#mpls
```

If you do not explicitly configure MPLS on the links, the inter-AS feature will not work properly.

- You cannot use an underscore character (\_) in an MPLS tunnel name. [Defect ID 31291]
- When you upgrade the router to JunosE Release 7.1.0 or a higher-numbered release from a release numbered lower than Release 7.1.0, remote ATM layer 2 over MPLS circuits (also known as MPLS shim interfaces) that use Martini encapsulation are erroneously signaled with the control word attribute setting “Control word is not preferred by default”. Because control words are required for these MPLS shim interfaces, these circuits should instead be signaled with the setting “Control word is preferred by default”. [Defect ID 87048]

**Work-around:** To reinstate the proper setting (“Control word is preferred by default”), remove the MPLS shim interface from the ATM subinterface and then reconfigure it.

## Multicast

- The **ip dipe sg-cache-miss** and **ipv6 dipe** commands are not intended or supported for customer use, although they are visible in the User Exec and Privileged Exec modes respectively. These commands are intended to be used in a Juniper Networks internal lab environment for testing without a traffic generator.
- Do not configure a multicast group with more than 10,219 outgoing interfaces (OIFS) on the same ES2 10G LM. [Defect ID 81768]
- When you upgrade a router running a release earlier than JunosE Release 8.2.x to JunosE Release 8.2.x or higher-numbered releases, the Protocol Independent Multicast (PIM) configuration settings in VPN routing and forwarding (VRF) instances are not restored after the upgrade is completed. This problem happens only if you did not previously configure PIM on the parent virtual router (VR) for the VRF. This problem occurs with both IPv4 PIM and IPv6 PIM configurations on the router.

After the completion of the upgrade process, if you attempt to restore the PIM configuration directly on the VRF, an error message is displayed. For example, if you try to restore the IPv4 PIM settings on the VRF using the **router pim** command, the following error message is displayed:

```
host1:vrf01(config)#router pim  
% PimIp not configured on this router
```

**Work-around:** To correct this problem after you upgrade a router running a release earlier than JunosE Release 8.2.x to JunosE Release 8.2.x or higher-numbered releases, you need to restore the PIM configuration on the upgraded router in two steps (first, on the parent VR, and then, on the VRF), instead of attempting to restore the PIM configuration directly on the VRF.

To restore IPv4 PIM configuration on the VRF, perform the following steps. These steps assume that a parent VR context, named “parent”, and a VRF in the parent VR, named “vrf01”, are already configured on the router.

1. Access the context of the parent VR, and create and enable IPv4 PIM on the parent VR.

```
host1(config)#virtual-router parent  
host1:parent(config)#router pim
```

2. Enter the VRF Configuration mode to restore PIM settings on the VRF in the parent VR.

```
host1:parent(config)#virtual-router parent:vrf01
```

3. Create and enable IPv4 PIM on the VRF in the parent VR.

```
host1:parent:vrf01(config)#router pim
```

After the IPv4 PIM configuration is recovered on the VRF, you can remove the IPv4 PIM configuration settings on the parent VR by using the **no router pim** command, if necessary.

To restore IPv6 PIM configuration on the VRF, perform the following steps. These steps assume that a parent VR context, named “parent”, and a VRF in the parent VR, named “vrf01”, are already configured on the router.

1. Access the context of the parent VR, and create and enable IPv6 PIM on the parent VR.

```
host1(config)#virtual-router parent  
host1:parent(config)#ipv6 router pim
```

2. Enter the VRF Configuration mode to restore PIM settings on the VRF in the parent VR.

```
host1:parent(config)#virtual-router parent:vrf01
```

3. Create and enable IPv6 PIM on the VRF in the parent VR.

```
host1:parent:vrf01(config)#ipv6 router pim
```

After the IPv6 PIM configuration is recovered on the VRF, you can remove the IPv6 PIM configuration settings on the parent VR by using the **no ipv6 router pim** command, if necessary.

## Packet Mirroring

- When both interface-specific mirroring and user-specific mirroring are configured on the same interface, the interface-specific secure policies take precedence. The interface-specific secure policies, which you manually attach using the CLI, override and remove any existing secure policies that were attached by a trigger action. If the interface-specific secure policies are subsequently deleted, the original trigger-based secure policies are not restored.
- Typically, when configuring packet mirroring, you configure a static route to reach the analyzer device through the analyzer port. If the analyzer port is an IP-over-Ethernet interface, you must also configure a static Address Resolution Protocol (ARP) entry to reach the analyzer device. However, because only a single static ARP entry can be installed for a given address at any given time, when you are using equal-cost multipath (ECMP) links to connect to the analyzer device, the static ARP configuration does not provide failover if the link being selected fails or is disconnected. Therefore, to provide continued connectivity if the link fails when using ECMP, enable the **ip proxy-arp unrestricted** command on the next-hop router for each ECMP interface. As a result, when the link fails, the router sends an ARP request to identify the MAC address of the analyzer device and gets a response over the new link.
- The ES2 10G LM supports the packet mirroring feature when the module is paired with the ES2-S2 10GE PR IOA, the ES2-S1 GE-8 IOA, or the ES2-S3 GE-20 IOA. When you use the ES2 10G LM with these IOAs, CLI-based interface-specific mirroring is not supported.

## Policy Management

- Multiple Forwarding Solution Rules for a Single Classifier List in a Policy
 

Before Release 5.2.0, it was possible to configure a policy with multiple rules that specified forwarding solutions where all of these rules were associated with a single classifier list. This typically was a configuration error, but the CLI accepted it. Beginning with Release 5.2.0, the CLI no longer accepts this configuration.

  - Multiple forwarding rules behavior for releases numbered lower than Release 5.2.0:
    - > If multiple forward or filter rules were configured to reference the same classifier list in a single policy, then all rules except the first rule configured were marked as eclipsed in the **show policy** command display. Next-interface and next-hop rules were treated in the same manner. The eclipsed rules were not applied.
    - > If a policy were configured with one rule from the [forward, filter] pair and one rule from the [next-hop, next-interface] pair, and if both rules referenced the same classifier list, then no visible eclipsed marking occurred. However, these two rules were mutually exclusive, and only one of them defined the forwarding behavior. The rule action that was applied was in the order (from highest to lowest preference): next interface, filter, next hop, forward. The applied rule was the rule whose behavior was seen by forwarded packets.

For example, if a policy had both a next-interface and a filter rule, then the next interface was applied. If a policy had a next-hop and a filter rule, then the filter rule was applied.

- Multiple forwarding rules behavior for Release 5.2.0 and higher-numbered releases:

Beginning with Release 5.2.0, the multiple rules behavior is designed so that when a forwarding solution conflict occurs within a policy, such as those described earlier, the second forwarding solution overwrites the preceding solution. That is, the last forwarding rule configured for the given classifier list within a policy is the forwarding behavior that is used. Also, a warning message is now displayed when this type of conflict occurs.

Example 1—In this example, the filter rule action overwrites the forward rule, and is therefore applied.

```
host1(config)#policy-list wstPolicyList
host1(config-policy-list)#forward classifier-group svaleClac1
host1(config-policy-list)#filter classifier-group svaleClac1
WARNING: This rule has replaced a previously configured rule.
host1(config-policy-list)#exit
host1(config)#
```

Example 2—In this example, three forwarding solution conflicts result in rules being overwritten. The filter rule is the last rule configured, and is therefore applied.

```
host1(config)#policy-list bostTwo
host1(config-policy-list)#forward classifier-group clac15
host1(config-policy-list)#next-hop 1.1.1.1 classifier-group clac15
WARNING: This rule has replaced a previously configured rule.
host1(config-policy-list)#next-interface atm 1/0.0 classifier-group clac15
WARNING: This rule has replaced a previously configured rule.
host1(config-policy-list)#filter classifier-group clac15
WARNING: This rule has replaced a previously configured rule.
host1(config-policy-list)#exit
host1(config)#
```



**Informational Note:** When you upgrade the nonvolatile memory to Release 5.2.0 or later, the upgrade removes eclipsed rules and rules whose behavior was not applied in the previous release. This removal ensures that the postupgrade forwarding behavior is the same as the preupgrade behavior.

**Informational Note:** If you upgrade to Release 5.2.0 or later and then configure your router using a script generated before Release 5.2.0, the postupgrade and preupgrade forwarding behaviors might not be the same. The new Release 5.2.0 configuration behavior is applied—the last policy rule configured for a given classifier list that specifies a forwarding behavior is the only rule remaining.

- The ES2 10G LM does not support the deprecated **next-hop** command.
- You cannot configure classifier lists that reference multiple fields for a VLAN policy list on the ES2 10G Uplink LM or the ES2 10G LM, with the exception of traffic-class and color. The system incorrectly classifies VLAN policies that classify using multiple fields. For example, an invalid policy list that references multiple fields uses both color and user-packet-class, or one classifier list using color and another using user-packet-class.

- In JunosE Release 11.0.0 and higher-numbered releases, you must specify at least one option by which the router defines a packet flow in order to configure classifier control lists (CLACLs) for policy lists to be attached to VLAN interfaces. Although a carriage return, <cr>, is displayed when you type a question mark (?) after entering the **vlan classifier list** *classifierName* command without defining any other keyword or CLACL option, an error message is displayed when you press **Enter** to configure the VLAN CLACL with only the name. The error message states that a VLAN classifier list cannot be configured without any classification criteria, such as color, traffic class, user packet class, or user priority. You must specify at least one keyword or option to configure VLAN CLACL successfully. [Defect ID 184139].

In JunosE releases earlier than Release 11.0.0, you could configure all CLACLs (except those CLACLs that were attached to IP interfaces) without specifying an option or a keyword. Because the policy management application treats only one default classifier group (configured with an \* in the policy list) as a valid setting, this functionality change ensures that only one classifier that matches all packets can be present in a VLAN policy list definition.

- Although it is not required, you can enclose the name of the classifier when you use the **show classifier-list** *classifierName* command and the name of the policy list when you use the **show policy-list** *policyName* command within double quotation marks. This method of specification of policy and classifier names ensures that the CLI interface does not process the abbreviated forms of the names as system-defined keywords, such as **brief** and **detailed**, available with **show policy-list** and **show classifier-list** commands.

For example, if you specify the **show policy-list b** command without enclosing the letter "b" within double quotation marks, assuming a policy list with the name "b" has been configured, the system auto-completes the letter "b" as **brief** and considers the command to denote a condensed display of policy lists (equivalent of **show policy-list brief** command). Similarly, if you enter the **show classifier-list d** command to display the details of a configured classifier list with the name "d", the CLI interface processes the command as a listing of classifier details (equivalent of **show classifier-list detailed** command).

To avoid incorrect and unexpected behavior in the output of the **show classifier-list** *classifierName* and **show policy-list** *policyName* commands, you must enclose the names of policy lists and classifier lists while using these commands within double quotation marks, especially if the names of the policy and classifier lists begin with letters that match the auto-complete forms of keywords. If the names of the policy and classifier lists do not match the beginning letters of the keywords or if you enter the full names of the policy and classifier lists, the system accurately processes the names even if you do not enclose them within double quotation marks while using these commands.

- No logs are created if you use the **policy-list** option with the **log severity** *severityValue* **policyMgrPacketLog** **policy-list** *policyListName* command when logging **policyMgrPacketLog** events. [Defect ID 87203]

## PPP

- The GE-2 line module does not support dynamic IP interfaces over static PPP interfaces when the PPPoE subinterface is also static. The OC3/STM1 GE/FE line module does not support dynamic IP interfaces over static PPP interfaces when the ATM interface column is also static.

## PPPoE

- On the ES2 4G LM, ES2 10G LM, and ES2 10G Uplink LM, data packets for PPPoE are not counted at the PPPoE interface. Instead, PPPoE data packets are counted at the PPP interface that sits on the PPPoE interface. Use the **show ppp interface** command to display the data packets. Control packets for PPPoE are counted at the PPPoE interface; use the **show pppoe interface** command to display the control packets.

## QoS

- In JunosE Releases 7.1.x, 7.2.x, and 7.3.x, you can attach a QoS profile to Ethernet interfaces that are configured in a link aggregation group (LAG) interface. However, beginning with JunosE Release 8.0.1, you can attach a QoS profile directly to the LAG interface. As of JunosE Release 8.0.1, the software restricts you from attaching a QoS profile to any Ethernet interfaces that are members of a LAG. [Defect ID 84632]

**Work-around:** Prior to upgrading from JunosE Releases 7.1.x, 7.2.x, or 7.3.x to JunosE Release 8.0.x or higher-numbered releases, remove the QoS profile from the Ethernet interface. When you have successfully upgraded to JunosE Release 8.0.x or higher-numbered releases, reattach the QoS profile to the LAG interface.

- In Release 7.2.0 and higher-numbered releases, you can configure the simple shared shaper to select scheduler nodes in a named traffic-class group as active constituents.

By default, simple implicit shared shapers activate scheduler nodes in named traffic-class groups. The implicit constituent selection process is now the same for both simple and compound shared shapers.

This is a change in default behavior. For releases before Release 7.2.0, you could not configure scheduler nodes as active constituents of the simple shared shaper, except for the best-effort node.

To recover the default behavior available before Release 7.2.0, or to select active constituents that are different, use simple explicit shared shapers to select best-effort nodes only.

- When you are configuring compound shared shaping using explicit constituents and you explicitly specify both a scheduler node and a queue stacked above the node as constituents of the shared shaper, the system selects the scheduler node (but not the queue) as the constituent.
- Egress strict-priority packets may experience high latency on OC3/STM1 ATM interfaces associated with the LM if you have shaped the port rate to more than 148.5 Mbps. [Defect ID 80378]

**Work-around:** To ensure low strict-priority latency, shape the port rate to no more than 148.5 Mbps.

- On the E120 and E320 routers, you cannot attach QoS profiles to L2TP tunnels by means of the CLI because the CLI does not pass the router ID to QoS. [Defect ID 81516]
- An error message regarding the qos-parameter instance QoSParameterDefinition is erroneously generated on an ERX1440 router when it is configured for L2C and QoS RAM and receives TLV 144 (DSL Type). The parameter instantiation actually functions properly. [Defect ID 80620]

- When you perform an SNMP walk of the `juniQosQueueStatistics` MIB, a timeout of up to 5 minutes ensues, during which the SRP module CPU utilization goes to 100 percent. [Defect ID 62252]
- Incorrect output is sent to the CLI the first time you enter Global Configuration mode or issue the **show subscribers** command after viewing the VLAN subinterface over which a subscriber is connected. [Defect ID 84507]
- The router cannot resolve inconsistent requests caused by two QoS profiles that modify the same scheduler property inconsistently. [Defect ID 61485]

**Work-around:** Avoid using two QoS profiles that modify the same scheduler property inconsistently, such as setting different values for the shaping rate for the same S-VLAN node.

- Egress traffic may be dropped on OC12/STM4 ATM interfaces if you have shaped the port rate to more than 542 Mbps.

## RADIUS

- JunosE Software provides extended commands for configuring the formats of the RADIUS NAS-Port attribute (attribute 5) and the RADIUS Calling-Station-ID attribute (attribute 31) when the physical port value is greater than 7.

When the physical port value is greater than 7:

- An incorrectly configured NAS-Port attribute format results if you use either the **radius nas-port-format 0ssssppp** or **radius nas-port-format ssss0ppp** command.
- An incorrectly configured Calling-Station-ID attribute results if you use either the **radius calling-station-format fixed-format** command or the **radius calling-station-format fixed-format-adapter-embedded** command.

**Work-around:** Use the following commands on routers that have line modules with more than 7 physical ports:

- To configure the NAS-Port attribute format, use the **radius nas-port-format extended [ atm | ethernet ]** command.
- To configure the Calling-Station-ID attribute format, use the **radius calling-station-format fixed-format-adapter-new-field** command.

## SNMP

- SNMP MIBs

Information about all the SNMP MIBs (both standard and proprietary) that the router supports in this release is available in the MIB directory in the `SW_Image_CD-2` folder of the JunosE Software image bundle, which you downloaded from the Juniper Networks website, that contains the release file for E120 and E320 routers.

- Some Juniper Networks SNMPv1-formatted traps contain an incorrect object identifier (OID) in the SNMPv1-Trap-PDU enterprise field. An SNMPv2 trap is typically identified by an OID that ends in the form `...x.y.z.0.n`. This OID appears, in full, as the value of the `snmpTrapOID.0` object in the `varbind` list of an SNMPv2-formatted trap. In the corresponding SNMPv1-formatted trap, this OID is broken down into subcomponents that fill the SNMPv1-Trap-PDU enterprise field (`...x.y.z`) and specific trap number field (`n`); the zero is unused.

The SNMPv1-formatted versions of the following Juniper Networks traps incorrectly contain ...x.y.z.0 in the SNMPv1-Trap-PDU enterprise field. That is, a zero is mistakenly appended to the correct enterprise OID value.

| Trap Name                             | Expected Enterprise OID     | Enterprise OID Sent by SNMP Agent |
|---------------------------------------|-----------------------------|-----------------------------------|
| junidApsEventSwitchover               | .1.3.6.1.4.1.4874.3.2.2.1.2 | .1.3.6.1.4.1.4874.3.2.2.1.2.0     |
| junidApsEventModeMismatch             | .1.3.6.1.4.1.4874.3.2.2.1.2 | .1.3.6.1.4.1.4874.3.2.2.1.2.0     |
| junidApsEventChannelMismatch          | .1.3.6.1.4.1.4874.3.2.2.1.2 | .1.3.6.1.4.1.4874.3.2.2.1.2.0     |
| junidApsEventPSBF                     | .1.3.6.1.4.1.4874.3.2.2.1.2 | .1.3.6.1.4.1.4874.3.2.2.1.2.0     |
| junidApsEventFEPLF                    | .1.3.6.1.4.1.4874.3.2.2.1.2 | .1.3.6.1.4.1.4874.3.2.2.1.2.0     |
| juniAddressPoolHighAddrUtil           | .1.3.6.1.4.1.4874.2.2.2.1.3 | .1.3.6.1.4.1.4874.2.2.2.1.3.0     |
| juniAddressPoolAbatedAddrUtil         | .1.3.6.1.4.1.4874.2.2.2.1.3 | .1.3.6.1.4.1.4874.2.2.2.1.3.0     |
| juniAddressPoolNoAddresses            | .1.3.6.1.4.1.4874.2.2.2.1.3 | .1.3.6.1.4.1.4874.2.2.2.1.3.0     |
| juniDhcpLocalServerPoolHighAddrUtil   | .1.3.6.1.4.1.4874.2.2.2.2.3 | .1.3.6.1.4.1.4874.2.2.2.2.3.0     |
| juniDhcpLocalServerPoolAbatedAddrUtil | .1.3.6.1.4.1.4874.2.2.2.2.3 | .1.3.6.1.4.1.4874.2.2.2.2.3.0     |
| juniDhcpLocalServerPoolNoAddresses    | .1.3.6.1.4.1.4874.2.2.2.2.3 | .1.3.6.1.4.1.4874.2.2.2.2.3.0     |
| pimNeighborLoss                       | .1.3.6.1.3.61.1             | .1.3.6.1.3.61.1.0                 |

**Work-around:** Use the OIDs that the SNMP agent sends.

- When you configure the router with an address pool that has two IP address ranges, only the range that you configured first is available via the MIB. [Defect ID 61232]

## SRC Software and SDK Software

- The SRC client does not prevent you from changing the name of the router while the client is connected to the SAE, resulting in SAE issues such as lost IP addresses and stale users. [Defect ID 77102]

**Work-around:** To change the router name while the SRC client is connected to the SAE, shut down the SRC client, change the name, then re-enable the SRC client.

## SSH

- If the SRP module restarts when SSH is configured in a VR other than default, SSH can sometimes become disabled. This happens if SSH attempts to bind with a VR before the VR comes back up after the restart. In this event, a warning message is generated to alert you to the fact that SSH is disabled in that VR. You must manually re-enable SSH either by accessing the console VTY or creating a Telnet session to the router.

## Stateful SRP Switchover (High Availability)

- Stateful SRP switchover remains inactive for 20 minutes after an initial cold-start or cold-restart of the router. This delay enables the system to reach a stable configuration before starting stateful SRP switchover.

If you want to override the 20-minute timer, turn high availability off by using the **mode file-system-synchronization** command, and then on again by using the **mode high-availability** command.

- Additional processing is required to maintain and mirror the necessary state information that enables subscriber sessions to stay up across an SRP failover. As a result, the performance of other control plane functions is reduced. Specifically, call setup rates are lower than in previous releases.



**Informational Note:** Rapid call setup rates are most important following an outage that causes all subscribers to drop, because many of the dropped subscribers will immediately attempt to reconnect. This type of outage occurs far less frequently with stateful SRP switchover.

We have ongoing development activities to characterize and improve call setup rates in future releases.

- When IP tunnels are configured on a router enabled for stateful SRP switchover, and the Service Module (SM) carrying these tunnels is reloaded, stateful SRP switchover transitions to the pending state. Stateful SRP switchover remains in the pending state for 10 minutes following the successful reloading of the SM. This amount of time allows for IP tunnel relocation and for the tunnels to become operational again on the SM. If an SRP switchover occurs while in the pending state, the router performs a cold restart.

**Work-around:** None.

- After a stateful SRP switchover, each layer of the interface columns must reconstruct its interfaces from the mirrored information. While the interfaces are being reconstructed the SRP module cannot send or receive frames, including the protocol frames that signal graceful restart behavior with OSPF and IS-IS peers. If the configured hold time is too short, peers might mistakenly declare the adjacency down during the time in which the graceful restart is taking place. [Defect ID 65132]

**Work-around:** Increase the hold time to provide sufficient time for interface synchronization before the peers declare the adjacency down.

- For OSPF, use the **ip ospf dead-interval** command to set the hold time. We recommend that you use Bidirectional Forwarding Detection (BFD) with a longer OSPF dead interval to achieve fast failure detection.
- For IS-IS, use the **isis hello-interval** and **isis hello-multiplier** commands to set the hold time.

We recommend the following hold times for each protocol, based on the number of interfaces.

| Interface Count | Recommended Hold Time for OSPF | Recommended Hold Time for IS-IS |
|-----------------|--------------------------------|---------------------------------|
| 16000 or less   | 80 seconds                     | 50 seconds                      |
| 16001 to 32000  | 87 seconds                     | 55 seconds                      |
| 32001 to 48000  | 90 seconds                     | 70 seconds                      |

- When you issue **show** commands as soon as the CLI is available after a stateful SRP switchover, the commands can hang until the warm restart is completed. [Defect ID 85306]

## Subscriber Interfaces

- MAC address validation is not supported on either of the following:
  - Packet-triggered subscriber interfaces that are created dynamically
  - Packet-triggered subscriber interfaces that are managed on the primary IP interface

A packet-triggered subscriber interface is created when the router receives a packet with an IP source address that does not match any entries in the demultiplexer table. When the router detects an unmatched packet, it generates a trigger event that determines whether to create a dynamic subscriber interface or configure an existing interface. To configure packet detection on the router, use the **ip auto-detect ip-subscriber** command.

## System

- ERX routers display different behavior from E120 routers and E320 routers when reporting modules as inactive.

ERX routers report a module as inactive when either:

- The I/O module is not present
- The primary line module is fully booted and ready to resume operation. In this case, the standby is currently providing services.

E120 routers and E320 routers report a module as inactive when either:

- The primary line module has no IOAs.
- The primary line module has IOAs, but they have failed diagnostics.
- The standby line module has taken over for the primary line module, and has control of the IOAs.

Because E120 and E320 routers can accommodate up to two IOAs per slot, at least one IOA must be online. If the second IOA fails, the line module is still online, but does not use both IOAs. You can ensure that every module is up and active in the system and not in a failed state by issuing the **show version all** command.

- In a router with a redundancy group that does not span quadrants (for example, a three-slot redundancy group that spans slots 0, 1, and 2 in an ERX1410 chassis), the potential bandwidth of the redundant module is erroneously included in the quadrant bandwidth calculation. The **show utilization** command might indicate that the bandwidth is exceeded for modules in that group. [Defect ID 31034]
- When you copy the running configuration to NVS, the E Series router verifies whether it has available space equal to at least twice the size of the .cnf file. If the space is insufficient, you cannot complete the copy. [Defect ID 40655]

**Work-around:** Make sufficient space on the NVS by deleting .rel or .cnf files.

- You cannot delete the ipInterface log after you delete the corresponding IP interface. This does not prevent you from adding filters to other interfaces, nor does it prevent you from adding a filter to the same interface if you re-create it after deletion. [Defect ID 34842/45063]

**Work-around:** Remove the filter before you remove the interface. Alternatively, if you remove the interface first, then you must remove all filters associated with all IP interfaces.

## System Logging

- If you enable engineering logs and set the control network logs to a level of notice or lower (down from the default of error), you might see erroneous controlNetwork log messages like the following that are generated because SNMP polling on line modules (correctly) detects no fabric: [Defect ID 43168]

**NOTICE 09/01/2002 18:47:52 CEST controlNetwork (slot 11): Control Bus Master slave error 0x5 while accessing slot**

- The **show configuration category management syslog virtual-router default** command incorrectly displays logs for multiple syslog destinations when you add a log to only one syslog destination. The **show log configuration** command shows the correct configuration. [Defect ID 84082]

## Tunneling

- When you configure the GE-2 line module, the GE-HDE line module, or the ES2-S1 GE-4 IOA to operate as a shared tunnel-server module, the available bandwidth for tunnel services is limited to 0.5 Gbps per module.
- In releases numbered lower than Release 7.3.0, a dynamic tunnel-server port was located on port 8 of the GE-HDE line module and GE-8 I/O module.  
In Release 7.3.0 and higher-numbered releases, the dynamic tunnel-server port is located on port 9. When you upgrade to Release 7.3.0, any existing tunnel-server port configurations move from port 8 to port 9.

## Known Problems and Limitations

This section identifies the known problems and limitations in this release. For more information about known problems that were discovered at customer sites, you can log in to the JunosE Knowledge Base at <https://www2.juniper.net/kb/>, enter the defect ID number in the Search by Keyword field, and click Search.

### ANCP

- On an E320 router that has established 3000 ANCP adjacencies with a client and traffic is initiated, the following behavior occurs sporadically: All existing Telnet sessions are disconnected and no new Telnet sessions can be established for several minutes. [Defect ID 83872]

### ATM

- The line module resets when you issue the **show nbma arp** command after you have configured NBMA interfaces on an ATM line module. [Defect ID 88491]
- When 16,000 PPPoA interfaces are configured on an OCx/STMx ATM line module paired with an OC3-4 I/O module in an ERX14xx model, ERX7xx model, or ERX310 router, Ping traffic passing through the line module on the restarting router experiences an outage of 103 seconds, which is beyond the maximum limit, after a unified ISSU from JunosE Release 9.2.0p1-0 to 9.3.0b0-12. This outage does not occur when the same configuration is applied on a Gigabit Ethernet interface. [Defect ID 179794]

- When a mirror rule that triggers on username is employed for packet mirroring of dynamic IP subscribers over ATM, removal of the rule does not disable packet mirroring. [Defect ID 175356]

**Work-around:** Use a mirror rule that triggers on account session ID rather than on username.

- When you issue the **no atm atm1483 auto-configure upperInterfaceType lockout-time** command in Profile Configuration mode, the lockout time range does not revert to the default values. [Defect ID 66544]
- When one or more ATM1483 attributes appears in a profile, the **show configuration include-defaults** command fails to display the default values for all possible ATM1483 attributes. [Defect ID 67157]
- The output of the **show atm arp** command displays only 4096 entries when the line module is configured with more than 4096 NBMA ARP entries. [Defect ID 68849]
- The **baseline interface atm** command fails for a VCD assigned by the router to F4 OAM circuits. [Defect ID 174482]
- Unified ISSU is not supported when ILMI is configured on ATM interfaces. [Defect ID 176007/177297/177122]
- ATM line modules reset after unified ISSU completes at the LAC when an MLPPP bundle with three links are tunneled to the LNS. [Defect ID 178821]
- For PPPoE, the AAL5 inPacket Discards counter might increment erroneously during call setup when a packet is passed directly to PPPoE for negotiation rather than being discarded. [Defect ID 51757]

**Work-around:** Incremental InPacketDiscards during call setup do not necessarily indicate a problem. However, we recommend you investigate an excessive count because that might indicate a connection that cannot be successfully brought up for some reason, such as RADIUS denials or improper configuration.

- The inPacketOctetDiscards counter in the output of the **show atm vc atm interface vcd** command includes both inBytesDropped and inBytesUnknownProtocol statistics. The inBytesUnknownProtocol statistics should be displayed by a separate counter.

At the major interface level, the inPacketDiscards counter includes both inPacketsDropped and inPacketUnknownProtocol statistics. The inPacketUnknownProtocol statistics should be displayed by a separate counter. [Defect ID 44286]

## BFD

- After you have shut down the interface to the next hop (for the route that is used to establish the BFD session), output for the **show bfd session** command erroneously indicates the shutdown interface as Management Interface (FastEthernet 6/0). [Defect ID 174271]

## CLI

- When you issue a **run show ppp** command, the CLI changes the configuration level of the command line to Global Configuration mode rather than remaining at the level from which you issued the command. [Defect ID 52165]

**Work-around:** Reissue the commands necessary to reenter the desired mode.

- The **logout subscribers all** command may not log out all of the DHCP subscribers. Although the bindings and DHCP addresses are cleared, the **show subscribers summary** command may display some of the DHCP subscribers. [Defect ID 180176]

**Work-around:** Try using the **dhcp delete-binding all** command. If this does not clear the subscribers, you may want to reload the line module to avoid further issues.

## DHCP

- DHCP packets are not forwarded to the DHCP server over dynamically created interfaces when all of the following are true: [Defect ID 180343]
  - DHCP relay or DHCP relay proxy is configured on the router.
  - The client-facing interfaces are created dynamically using bridged Ethernet over static ATM PVCs.
  - The **ip auto-detect ip-subscriber** command is configured to enable packet detection (packet triggering) and to trigger creation of dynamic subscriber interfaces.

**Work-around:** To avoid this defect, do all of the following:

- Do not use the **ip auto-detect ip-subscriber** command to enable packet triggering and to create dynamic subscriber interfaces
- Ensure that DHCP external server is configured in the virtual router.
- Ensure that the **set dhcp relay inhibit-access-route-creation** command is configured in the virtual router to prevent DHCP relay from installing host routes by default.

## DHCP External Server

- With the unique client ID option enabled, when two clients with the same MAC address or client ID are on an interface (where one client is connected over a router and relay and the other client is connected directly), sending a release request from one of the clients might terminate another client. [Defect ID 179759]
- The DHCP renew counter and release counter (displayed with the **show ip dhcp-external statistics** command) are doubled rather than incremented for each renew and release sent. [Defect ID 78802]
- When DHCP clients on an S-VLAN over bridged Ethernet stack configuration send a decline message to a router that has DHCP relay and DHCP external server configured in the same VR, the clients bindings are not removed from the DHCP external server. [Defect ID 87086]
- When DHCP relay and DHCP external server are configured in the same VR with server-sync enabled, bindings are not created in the DHCP external server when DHCP clients on an ATM bulk configuration interface stack and dynamic VLAN over Ethernet stack sends a renew message. [Defect ID 87087]

## DoS Protection

- A Telnet session closes when sending ipLocalBGP protocol traffic at a rate in the range 4096–4200 packets per second (pps) with suspicious control flow detection enabled. [Defect ID 81974]

**Work-around:** When the traffic drops below 4096 pps, open a new Telnet session.

## Ethernet

- When autonegotiation is enabled on Gigabit Ethernet interfaces with the **speed automatically negotiate** command, issuing the **link selection** command logs out subscribers. [Defect ID 87185]

**Work-around:** Use the following commands to enable auto link selection (GE port redundancy) and to switch from one port to the other port:

```
host1(config-if)#no link selection
host1(config-if)#link failover force
```

## File System

- When the primary SRP module is running JunosE Release 7.2.0 or higher-numbered release and the standby SRP module is running a release numbered lower than Release 7.2.0 (as in a downgrade situation), you cannot display the files for the standby SRP module. [Defect ID 74104]

## Forwarding

- When performing MAC validation to match subscriber demux entries with ARP host entries, the ES2 10G LM does an exact match, rather than a longest prefix match. The subscriber demux entry source address must be a /32 value matching the IP address of an ARP entry in order to validate the MAC address against that ARP entry. [Defect ID 79641]
- When PPPoE over LAG is configured on an interface, and you re-execute the PPPoE-over-LAG configuration before you delete the previous configuration, the ES2 10G LM line module resets. [Defect ID 179639]

**Work-around:** Before you can re-execute the PPPoE-over-LAG configuration, delete the existing PPPoE-over-LAG configuration.

- Specifying S-VLAN ranges that partially overlap does not work. [Defect ID 81918]

For example, the following configuration fails because S-VLAN 22 falls within the previously specified S-VLAN range of 21–23.

```
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 21 23 401 426
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 21 23 427 712
host1(config-if)#vlan bulk-config BulkCezarCnfg2 svlan-range 22 22 101 110
```

**Work-around:** You can do either of the following to avoid this problem.

- Specify each S-VLAN within the partially overlapping range as individual S-VLANs, as in the following example:

```
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 21 21 401 426
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 22 22 401 426
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 23 23 401 426
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 21 21 427 712
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 22 22 427 712
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 23 23 427 712
host1(config-if)#vlan bulk-config BulkCezarCnfg2 svlan-range 22 22 101 110
```

- Use fully overlapping ranges rather than partially overlapping ranges, as in the following example:

```
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 21 23 401 426
host1(config-if)#vlan bulk-config BulkDHCPCnfg1 svlan-range 21 23 427 712
host1(config-if)#vlan bulk-config BulkCezarCnfg2 svlan-range 21 23 101 110
```

- When you attach certain hierarchical policies to subinterfaces as input policies, secondary input policies, and output policies, incoming traffic loss can occur when the number of subinterfaces to which the policies are attached exceeds 4600. [Defect ID 86741]
- Ethernet statistics are incorrectly displayed for virtual port 8 of the ES2-S1 GE-8 IOA when that module is paired with the ES2 10G LM or the ES2 10G Uplink LM. [Defect ID 174784]
- The ES2 10G LM does not support framed routes configured for dynamic subscriber interfaces. [Defect ID 83154]
- On the ES2 10G LM, a VLAN ID of 0 assigned to an interface can prevent packets from being properly forwarded. [Defect ID 176125]

## ICR

- If you saved the running configuration of the router as a script file (.scr) and execute the script to apply the settings on the router, ICR partition configuration commands in the .scr file might fail to add group members to the partition. This problem happens when the subscriber configuration in the .scr file is placed before the ICR partition configuration. However, this problem does not occur if you used a system configuration (.cnf) file to set up the router. [Defect ID 183913]

**Work-around:** To correct this problem and enable ICR partitions to be created correctly, make sure that you add the ICR partition configuration before the subscriber interface configuration in the .scr file. You can perform this reordering by modifying the .scr file to place the commands that configure subinterfaces for ICR partitions before the commands used for VLAN-based or S-VLAN-based grouping of subscribers.

- When you configure ICR settings using a CLI macro, ICR commands are run in quick succession. Sometimes, in such a scenario, the active SRP module resets if the event that causes the change of state of the VRRP instance reaches the ICR application before the ICR partition has been created. [Defect ID 184095]

**Work-around:** To avoid this problem, add an additional delay of one second using the **sleep** command in the macro, before the **ip vrrp vrid enable** command that is written in the macro to enable VRRP instance.

For example, consider a macro that contains the following commands:

```
ip vrrp vrid enable
ip vrrp vrid icr-partition partitionId
```

Modify the macro, as follows, to add a delay of one second before the VRRP instance ID is enabled on the router and a delay of another second before the ICR partition that corresponds to the VRRP instance is created:

```
sleep 1
ip vrrp vrid enable
sleep 1
ip vrrp vrid icr-partition partitionId
```

## IGMP

- In a router with an ES2 10G ADV LM and ES2-S2 10GE IOA combination and the line module contains a shared tunnel-server port as well as GRE tunnels configured with secure policies for mirroring traffic, multicast group memberships that had been previously established over IGMP interfaces on the router are lost after you perform a stateful SRP switchover on a chassis running JunosE Software Release 11.2.0. [Defect ID 186844]

This problem happens only when both multicast data packets and IGMP packets are transmitted on the network, regardless of whether you perform a stateful SRP switchover. This problem does not occur when only IGMP packets, without multicast data streams, are sent over the network.

In such a scenario, IGMPv2 is enabled on the interfaces using the **ip igmp promiscuous** command to accept IGMP reports from hosts on any subnet. Although the hosts send new join requests to the router, the router does not send group membership queries to such hosts to enable the creation of fresh memberships. Creation of new memberships fails because the router drops the received group membership reports from hosts. Any subsequent attempt from a host to join the multicast group on the router that has the ES2 10G ADV LM fails. However, after you reload the ES2 10G ADV LM, join requests from hosts succeed and such hosts become members of the multicast group.

Also, this problem of removal of group membership does not occur with the following line module combinations on E Series routers and multicast group memberships are formed properly:

- ES2 10G ADV LMs with ES2-S1 GE-8 IOA
  - ES2 10G LMs with ES2-S2 10GE PR IOA
- IGMPv3 proxy is not supported. [Defect ID 46038]
  - The default value for the IGMPv3 proxy unsolicited report interval timer should be 1 second rather than 10 seconds (the value for v2). [Defect ID 46040]
  - The E Series router IGMPv3 proxy does not operate correctly in the presence of IGMPv2 queriers. [Defect ID 46039/46045]

**Work-around:** If an IGMPv2 router is present on the network, do not configure version 3 with the **ip igmp-proxy version** command on that network interface. (Version 2 is the default.)

- When more than about 100,000 mapped OIF entries are configured on a virtual router, issuing the **no virtual router** command for this and other virtual routers does not delete all the virtual routers within the deletion timeout interval (3 minutes). The virtual routers do eventually delete after this timeout. [Defect ID 63882]
- The E Series router does not log a warning when it receives an IGMPv2 query but is not configured to use IGMPv2 on the interface. [Defect ID 46046]

## IP

- The ES2 4G LM can reset during a unified ISSU after you issue the **issu start** command on a router configured with 8000 dynamic VCs and 8000 packet-triggered dynamic subscriber interfaces. [Defect ID 86761]

- If you have a large configuration on a hybrid module combination (OC3/STM-1 GE/FE line module with the OC3-2 GE APS I/O module), boot from NVS, and issue the **slot erase** command before booting has completed, the line module resets. [Defect ID 64104]  
**Work-around:** To recover from the error, issue the **slot reload** command anytime after the module begins to reset.
- Deleting a VRF with 32,000 static subscriber interfaces fails to complete. [Defect ID 82670]  
**Work-around:** Use a macro to delete all static subscriber interfaces before you delete a VRF.
- The **ip route permanent** command does not work properly. [Defect ID 34303]  
**Work-around:** Issue the **ip alwaysup** command to prevent the route from being removed from the IP routing table after the interface is shut down.
- Traffic statistics for dynamic subscriber interfaces associated with Mobile IP subscribers are not maintained as the subscribers move between Mobile IP nodes. Consequently the reported interface statistics are only the values accumulated since the last time a mobile node moved. [Defect ID 174509]
- When a router configured with PIM on a virtual router undergoes multiple warm restarts, the router subsequently hangs when an IP profile is configured. [Defect ID 176470]
- Logical port 20 on the ES2-S3 GE-20 IOA is reserved for the hardware multicast packet replication feature. Logical port 20 and the hardware multicast replication feature are not supported on the ES2-S3 GE-20 IOA in this release. [Defect ID 84727]
- When you change the demultiplexer type on a primary interface that has 1024 demultiplexer table entries, the ICC ping threshold times out due to the removal of the old entries and the addition of the new ones. [Defect ID 182218]
- After an SRP stateful switchover completes on an ERX1410 router configured with a single VPN routing and forwarding instance (VRF) and Network Address Translation (NAT), the SRP module that becomes active after the switchover resets. [Defect ID 180058]

## IPSec

- In a network where you use the **tunnel signalling** command to specify that the security parameters and keys are configured manually for IPSec tunnels between VRs, the line modules reset when you delete and then re-create the IPSec tunnels. If you attempt to configure the tunnels again after the modules come back up, the line modules reset again.  
**Work-around:** Configure the IPSec tunnels to use ISASKMP/IKE to negotiate SA and establish keys. [Defect ID 178304]
- IPSec tunnels created over Fast Ethernet interfaces fail to come up. [Defect ID 179256]  
**Work-around:** After you create the tunnel, bounce the tunnel interface by issuing the **shutdown/no shutdown** command sequence. The tunnel comes up successfully.

## IS-IS

- On a router configured with IS-IS and BFD, using the **redundancy force srp** command to force an SRP switchover sometimes brings down IS-IS and BFD. [Defect ID 179287]
- IS-IS graceful restart (nonstop forwarding) does not work on the broadcast interface when the restarting router is the designated intermediate system (DIS). Graceful restart works properly when the restarting router is not the DIS. [Defect ID 61496]

## L2TP

- After a unified ISSU completes on a router functioning as an L2TP access concentrator (LAC), traffic outages occur on the L2TP network server (LNS)-facing interface at the LAC in a configuration with 16,000 or 32,000 L2TP sessions over 500 tunnels. [Defect ID 180147]

## MLD

- MLDv2 proxy is not supported. [Defect ID 46038]
- The E Series router MLDv2 proxy does not operate correctly in the presence of MLDv1 queriers. [Defect ID 46039/46045]  
**Work-around:** If an MLDv1 router is present on the network, configure version 1 with the **ipv6 mld-proxy version** command on that network interface. (Version 2 is the default.)
- The default value for the MLDv2 proxy unsolicited report interval timer should be 1 second rather than 10 seconds (the value for v1). [Defect ID 46040]
- The E Series router does not log a warning when it receives an MLDv1 query but is not configured to use MLDv1 on the interface. [Defect ID 46046]

## MLPPP

- Failure to meet all of the following conditions for fragmented packets can result in an incorrect operation during packet classification of the resulting reassembled packet: [Defect ID 50111]
  - The initial fragment of a packet must either contain the entire MLPPP packet or be greater than 128 bytes.
  - The fragment size of the peer must not be lower than 128 bytes.
  - The initial fragment of a packet must be larger than subsequent fragments of that packet.

## Mobile IP

- The **clear ip mobile binding nai @realm** command does not work. [Defect ID 178652]

**Work-around:** Use the following version of the command instead:

```
clear ip mobile binding nai user@realm
```

- The setup rate for Mobile IP client sessions decreases when you repeatedly bring a large number of sessions down and back up. [Defect ID 178760]

- The `@realm` variable and the `@` keyword alone do not work for the **show ip mobile binding** command. [Defect ID 178653]

**Work-around:** You can use the `user@realm` syntax instead to display the binding for a specific user, as in this example:

```
host1#show ip mobile binding nai xyz@example.com
```

Alternatively, you can display the entire Mobile IP binding table by issuing the **show ip mobile binding** command without additional options.

- When mobility bindings are present and you delete the Mobile IP home agent with the **no virtual router** command, Mobile IP sends a RADIUS Acct-Stop message with no accounting statistics for the subscribers. [Defect ID 179081]

**Work-around:** Issue the **clear ip mobile binding all** command before you issue the **no virtual router** command. The **clear** command clears all the MIP subscribers and sends a RADIUS Acct-Stop message with the appropriate accounting statistics for the subscribers.

## MPLS

- When MPLS and IS-IS are configured on Ethernet interfaces, you cannot delete the interface after the IP address is removed. This issue is not a problem on Ethernet VLAN interfaces. [Defect ID 66813]

**Work-around:** Issue the **no mpls** command to disable MPLS, then delete the interface.

- If LSPs are announced into IS-IS, then the IS-IS routes cannot be used for multicast RPF checks, because LSPs are unidirectional. [Defect ID 28526]

**Work-around:** Configure static RPF routes with native hops when LSPs are autoroute announced to IGPs.

- When the IPv4 explicit null label appears anywhere other than at the bottom of the label stack, TTL expiration for this label is not handled correctly. As a result, the **traceroute** command does not work correctly for LSPs that have the IPv4 explicit null label anywhere other than at the bottom of the label stack. [Defect ID 76037]
- When you issue a **traceroute** or **trace mpls** command to trace the paths of router packets over MPLS interfaces on an ES2 10G LM or ES2 10G Uplink LM, the results include an extra unknown host. [Defect ID 174537]

## Multicast

- When you configure more than 10,219 outgoing interfaces (OIFs) on the same ES2 10G LM in a single multicast group, the configuration of the multicast group's OIF membership from the SRP module to the line module exceeds the size of a single message and is sent in fragments. Because of this fragmentation, the ES2 10G LM generates the following error message: [Defect ID 81768]

```
pc: 0x9e5c88: -> fatalPanic(void) offset: 0x8
```

## Netflow

- Flow sampling stops after a cold switchover on a router that is configured with 16 VRs and 32 interfaces per VR, when all flows are passing through the configuration (32 flows per VR). [Defect ID 74477]

**Work-around:** After the cold switchover is completed, reissue the **ip flow-sampling-mode packet-interval 10** command on each VR, even though the command is present in the configuration.

- The OC3/STM1 GE/FE line module might reset after sending Ethernet traffic into a VPLS network in a test environment when Ethernet packets are flooded to remote VPLS bridges. [Defect ID 74540]

## Policy Management

- On the E320 router, redirecting a large configuration with thousands of interfaces to a script file can take a long time, perhaps exceeding a half-hour depending on the configuration. [Defect ID 80429]
- If you have removed the last rule in a policy list, the router generates a warning only after you exit Policy List Configuration mode. If you have removed the last policy rule and then added a classifier group before you exit Policy List Configuration mode, the router does not generate a warning about removing the last rule. [Defect ID 83834]
- When an MD-Port-Number value greater than 65,535 is sent to an E120 or E320 router by means of a CoA request, the value that is displayed in the UDP header of mirrored packets is the actual value minus 65,536. For example, an MD-Port-Number of 65,540 is displayed in the mirrored packet as 4. [Defect ID 84712]
- On the E120 and E320 routers, when a mirror rule is deleted after a CoA request is sent with Juniper-LI-Action set to No-Action, the existing mirroring session is not disabled. [Defect ID 84826]
- When you reload the slot holding a GE-2 or GE-HDE line module and you have configured more than about 2000 policies with rate limiting on that module, the drop count becomes more than expected. This unexpected drop count does not occur when you create the same configuration after you reload the router to the factory-default configuration. [Defect ID 175696]
- On E320 line modules that support secure policies, the SRP module enables you to configure more than 1022 secure policies per module. [Defect ID 175756]

**Work-around:** To avoid potential performance issues, we recommend that you do not configure more than 1022 secure policies per module.

- Unified in-service software upgrade (unified ISSU) is not supported on an E120 or E320 router if a hierarchical policy is attached to an external parent group. [Defect ID 177478]
- When you modify a rate-limit profile in Global Configuration mode after the system is in a scaled state, changes to the rate-limit profile fail owing to lack of adequate policy resources. However, the changed value of the rate-limit profile is displayed in the output of the **show rate-limit profile** command. [Defect ID 79342]

**Work-around:** To avoid this problem, do not update the rate-limit profile in Global Configuration mode in a scaled environment.

- When you enter the **no ip policy-parameter hierarchical parameterName** command or **no ipv6 policy-parameter hierarchical parameterName** command for a hierarchical policy-parameter type in Interface Configuration mode, the explicit reference of the parameter is removed successfully from the interface. However, the Referenced by interfaces field in the output of the **show policy-parameter** command does not change from the previously configured value to implicit. [Defect ID 183957]

**Work-around:** To correct this problem, remove the entire interface configuration.

## PPPoE

- The E Series router erroneously accepts a PADI with a payload length of 0 instead of rejecting it and incrementing the PPPoE Invalid PAD packet length counter. [Defect ID 48356]

## QoS

- You cannot paste a **load-rebalance** command string that uses the percent option into a console or Telnet session from **show configuration** output because the output displays the % sign rather than the **percent** keyword that was submitted with the command and the percent sign is not recognized by the CLI. [Defect ID 81705]
- The compound shared shaping feature does not work properly on egress forwarding ASIC 2 (EFA2)-based ATM line modules when the shared shaper is queue-controlled as opposed to node-controlled. In a node-controlled configuration, in which you configure the shared-shaping rate on the best-effort scheduler node for the logical interface, integration of the EFA2 and ATM segmentation and reassembly (SAR) schedulers functions properly. However, in a queue-controlled configuration, in which you configure the shared-shaping rate on the best-effort queue for the logical interface, integration of the EFA2 and ATM SAR schedulers does not function properly. [Defect ID 69167]

**Work-around:** Use node-controlled compound shared shaping configured on the best-effort scheduler node with EFA2-based ATM line modules.

- The CLI erroneously enables you to configure a QoS profile with the **ethernet node group** command. [Defect ID 80861]
- The dynamic shaping rate calculated by the simple shared shaper can vary because of the variation in the enqueue rate of the constituent queues. Even when the offered load is constant, the mechanism that calculates the enqueue rate introduces a slight variation, introducing a slight variation in the calculated dynamic shaping rate. [Defect ID 80938]
- On a router that has both an ES2 10G LM and an ES2 4G LM installed, the byte count reported by the **show fabric-queue egress-slot** command is incorrect. The reported packet count is correct. [Defect ID 80965]
- PPP sessions may be dropped if you change the shaping rate in a QoS profile that affects thousands of circuits while QoS traffic affected by the profile is being forwarded. [Defect ID 82950]

**Work-around:** Do not change the shaping rate in a QoS profile that affects thousands of circuits while QoS traffic is using the profile.

- When QoS resources such as failure nodes and statistics bins are exhausted because of insufficient memory available on the line module, the failures are properly logged, but additional log messages are generated every 10 minutes that report zero failures. [Defect ID 85105]

- The **no qos-parameter-define definition** command does not delete the specified QoS parameter definition. [Defect ID 176844]  
**Work-around:** Remove the interface and add the desired QoS parameters when you re-create the interface instead of deleting the definition.
- When 32,000 subscribers with 128,000 QoS queues are brought up on an ES2 10G or ES2 10G ADV LM, the LM resets if you modify the QoS profile that contains the best-effort IP or VLAN node rule, which references a scheduler profile configured with shared shaping rate, to a scheduler profile configured with legacy shaping rate. [Defect ID 183291]  
**Work-around:** To avoid this problem, apply shared shaping on the best-effort queue, instead of on the best-effort node.
- Simple shared shaping does not function correctly when it is used for 32,000 subscribers on an ES2 10G ADV LM. However, when you change the shaper to compound shared shaping, it works properly. Also, simple shared shaping does not function correctly for 16,000 subscribers on an ES2 10G ADV LM. [Defect ID 183512]
- When you configure an E120 or E320 router with an ES2 10G ADV LM as a LAC on one side of an L2TP tunnel and as a LNS to receive packets from the LAC on the other side of the tunnel, use RADIUS servers for authentication of subscribers on both sides of the tunnel, and attempt to bring up 16,000 subscribers on the L2TP tunnel, the LM that has subscribers on the LAC side of the tunnel resets when approximately 8000 logged-in subscribers are logged out and try to reestablish the connection. [Defect ID 184118]

## RSVP-TE

- After stateful SRP switchover, forwarding of VPN traffic might not resume if the core interface that carries an MPLS base tunnel with LDP over RSVP-TE flaps (constantly goes up and down). [Defect ID 182019]

## Service Manager

- After you activate an independent IPv6 service and issue either of the following commands on the default virtual router or any other virtual router, except the one on which the subscriber session is active, no output is displayed in the CLI interface: [Defect ID 181929]

- **show service-management subscriber-session** *subscriberName* **interface** *interfaceType interfaceSpecifier*
- **show service-management subscriber-session** *subscriberName* **interface** *interfaceType interfaceSpecifier* **service-session** *serviceName*

This problem also occurs when a subscriber is authenticated using a RADIUS server for a combined IPv4 and IPv6 service in a dual stack.

**Work-around:** To avoid this problem, use the **show service-management owner-session** *ownerName ownerId* command to display subscriber session information based on the session owner, instead of the **show service-management subscriber-session** *subscriberName interfaceType* command to display details on subscriber sessions.

## SONET

- You cannot use the highest sensitivity bit-error rate setting (a value of 9) associated with APS/MSP alarm when you issue the **threshold sd-ber** command to configure a cOCx/STMx line module with cOC12-APS-capable IOAs. [Defect ID 72861]

**Work-around:** Use only a value in the range 5–8 when you issue the **threshold sd-ber** command for this module combination, as in the following example:

```
host1(config)#controller sonet 2/1
host1(config-controll)#aps group boston
host1(config-controll)#aps protect
host1(config-controller)#threshold sd-ber 6
```

## SRC Software and SDX Software

- When multiple IPv6 interfaces are configured with policies attached from SRC, only some of the IPv6 interfaces have the policies attached. [Defect ID 179498]
- Changing the SSCC status (enable/disable) while IPv6 interfaces are configured might cause the SRP to reset. [Defect ID 179537]

## Stateful SRP Switchover (High Availability) and IP Tunnels

- A packet loss sometimes occurs during stateful SRP switchover when you use the **ping** command on a router that is configured for OSPF graceful restart, and is connected to a helper router in the OSPF IPv6 broadcast network and another helper router in the OSPF IPv6 backbone area. [Defect ID 181470]
  - ERX7xx model, ERX14xx model, or ERX310 router:
    - When you use the **ping** command with the IPv6 address of the helper router in the multicast area as the destination address and the loopback address of the helper router in the backbone area as the source address, a packet loss of 2 seconds occurs for the first stateful SRP switchover. However, no packet loss occurs for successive stateful SRP switchovers.
    - When you use the **ping** command with the IPv6 address of the helper router in the broadcast network as the destination address and no source address when stateful SRP switchover is performed the first time, an identical packet loss occurs. In this case too, no packet loss occurs during subsequent switchovers.
  - E120 router or E320 router
    - When you use the **ping** command with the IPv6 address of the helper router in the broadcast network as the destination address and the loopback address of the helper router in the backbone area as the source address, no packet loss occurs.
    - When you use the **ping** command with the IPv6 address of the helper router in the multicast area as the destination address and no source address, a packet loss of 1–2 seconds sometimes occurs during stateful SRP switchovers.
- On E120 and E320 routers configured with an SRP module that contain a high availability pair of line modules, the primary SRP module intermittently resets when you perform a stateful SRP switchover after a stateful line module switchover is completed. This problem occurs only when login and logout of subscribers is in progress during the stateful line module switchover. [Defect ID 186836]

## Subscriber Management

- Dynamic subscriber interfaces continue to remain in the down or not present operational state in either of the following scenarios: [Defect ID 81269]
  - If you configured a dynamic interface column, such as a dynamic bridged Ethernet interface, dynamic VLAN interface, or an ATM interface, and when any one of the following conditions is satisfied:
    - > The major interface is bounced (shut down and reenabled)
    - > The major interface is shut down, which cause the dynamic VLAN interfaces to be removed
    - > The physical link goes down and comes back up
    - > The line module is removed and reinserted
  - If you configured a static interface column and removed the major interface

These scenarios might occur if you administratively issue the **shutdown** and **no shutdown** commands on the major interface in which the dynamic interface column is configured.

**Work-around:** Use the **no interface ip ipAddress** command to remove the dynamic subscriber interfaces. Although you can use the **dhcp delete-binding** command to remove the DHCP binding and the dynamic subscriber interfaces, the DHCP client does not detect the binding removal and retains the lease.

- When a dynamic GRE tunnel interface for Mobile IP relocates between SM modules because the original SM reloads, Mobile IP deletes the relocated tunnel interface. [Defect ID 178399]
- When a subscriber has subscribed for a service, service session accounting records always contains a default Acct-Terminate-Cause value of 10. This value remains unchanged even after you use the **terminate-code** command to configure a custom mapping between application terminate reasons and RADIUS Acct-Terminate-Cause attributes. [Defect ID 181043]

## System

- You cannot use a configuration script to boot the E320 router. [Defect ID 80304]
- If you hot swap an IOA and then remove it again before that IOA's OK or FAIL LED is illuminated, the associated line module can reset. [Defect ID 177313/177267]

**Work-around:** Ensure that you firmly insert the IOA into the chassis when you hot swap IOAs. Do not attempt a second hot swap of an IOA that has not indicated that it completed the first hot swap cycle. You can remove the IOA when either its OK or FAIL LED is illuminated.
- If your router is in Manual Commit mode, then you must issue the **write memory** command before you perform an SRP module switch or a manual reload. You must do this even when you have made no changes to the system configuration and the file systems are synchronized. [Defect ID 44469]

## System Logging

- If you enable engineering logs and set the control network logs to a level of notice or lower (down from the default of error), you might see erroneous controlNetwork log messages like the following that are generated because SNMP polling on line modules (correctly) detects no fabric: [Defect ID 43168]

**NOTICE 09/01/2002 18:47:52 CEST controlNetwork (slot 11): Control Bus Master slave error 0x5 while accessing slot**

## TCP

- The SRP module resets in any of the following circumstances on an E320 router that has a line module configured with 5000 ANCP adjacencies: [Defect ID 176916]
  - When you issue the **issu initialization** command from the console and then reload the line module from a Telnet session.
  - When the client that has the 5000 ANCP clients resets or an intermediate switch resets.
  - When you reload the line module.

## Unified ISSU

- ATM line modules might reset after a unified ISSU when you attempt to add memory to a VLAN subinterface in a large bridged Ethernet configuration. [Defect ID 178798]
- Under certain conditions, a unified ISSU from JunosE Release 9.2.0p1-0 to the current release fails, and causes the SRP module and the ES2 4G LM to reset. [Defect ID 179975]
- When any of the subsystems is excluded for a JunosE release, a unified ISSU to that release fails to apply conversion code to all of the line modules. As a result, the line modules reset when they come up with that release. [Defect ID 179595]

**Work-around:** To prevent the exclusion of a subsystem file from the release, do the following before you upgrade to a new JunosE release that supports unified ISSU:

1. Issue the **show subsystems file** *fileName.rel* command, where *fileName* is the name of the software release file, to determine whether any of the subsystem files are excluded from the release.
2. For each subsystem file that is excluded, issue the **no exclude-subsystem** *subsystemName* command to remove the exclusion for the specified subsystem file.

If you copied the software release to the router before removing the subsystem file from the exclusion list, you must copy the release to the router again to ensure that all subsystem files are included in the release.

- Unified ISSU is not supported with 8000 bridged Ethernet interfaces on an OC3/STM1 GE/FE ATM line module. [Defect ID 178811/178797/179547]

- During the unified ISSU operation, if you modify the router configuration after the initialization phase of the process is completed and before you issue the **issu start** command to commence the upgrade phase of the unified ISSU process, the unified ISSU procedure completes successfully and the stateful SRP switchover process begins to synchronize between the active and standby SRP modules. When the synchronization process is in progress, the standby SRP module reloads for the second time. After the second reload of the standby SRP module ends, the synchronization process also ends properly.

Although the standby SRP module reloads for the second time when it is synchronized with the upgraded release, normal router operations, such as handling of subscriber sessions and forwarding of traffic, remain unaffected. [Defect ID 185517]

## Resolved Known Problems

The following problems were reported open in Release 11.2.0 and have been resolved in this release, or have been resolved since the 11.2.0p0-1 patch release. For more information about particular resolved problems, you can log in to the JunosE Knowledge Base at <https://www2.juniper.net/kb/>, enter the defect ID number in the Search by Keyword field, and click Search.

### CLI

- When you shut down a port, the value of the optical power associated with that port falls below the threshold value. When the value of the optical power falls below the threshold value, the status of the optical warning flag changes to the active state. The IOA driver polls all the optical warning flags every 20 seconds, and if an optical warning flag is active, traps and logs are generated for the respective port until the value of the optical power is restored to normal. [Defect ID 187248]

For instance, when two ports are connected back to back in a line module, when you shut one port, the trap is triggered on both ports as optical power falls below the threshold value on both these ports (Tx on the shut port and Rx on the remote port). Traps and logs are also generated when you:

- Remove a cable
- Cut a cable
- Insert an SFP and do not connect a cable to it.

### Ethernet

- VLAN Interface Monitoring reports incorrect speed and/or accepts invalid interface name as a parameter. [Defect ID 89749]
- After the primary lag link is shutdown, the dynamic VLAN is deleted instead of being made dormant when subscribers log out. [Defect ID 90815]
- "stacked vlan anyUntagged" with Bridge-ethernet configuration gets accepted in "interface configuration" [Defect ID 91071]
- Sumitomo 10KM-LR XFP causes LM10U CPU to reach 100% [Defect ID 91123]

### Forwarding

- LM-10 reset type: panic task: scheduler file: fc3DmaDriver.cc line: 1013 [Defect ID 89670]

### Hardware

- ERX does not update ARP cache when Gratuitous ARP Reply/Response is received for an IP which already exists in ERX ARP table. [Defect ID 88936]
- LM4 reset type: processor exception 0x100 (multiple=0x2ff) task: interrupt [Defect ID 90219]
- New routes cannot be downloaded to LM10 due to tpub problem. [Defect ID 90291]
- (DT) Line card redundancy is broken during HW error and "Not Responding" states at UPGRADE / COLD START / COLD SWITCH. [Defect ID 90836]
- LM10 memory leak in LuCodeBranch and STL pools. [Defect ID 90986]
- IC-XSCALE multiple ping retries [Defect ID 186597]

## IGMP

- Deadlock igmp - ipHelper while testing the fix for 90323. [Defect ID 90547]

## IP

- Few PPP sessions drop due to "**aaa duplicate check**" failure even though the /32 route is not present in SRP routing table. [Defect ID 90806]

## L2TP

- New active SRP reset type halt after HA switch while testing the fix for 90586. [Defect ID 90868]
- L/C does not respond to SCCRQ/stopCCN during HA switch. [Defect ID 90875]
- L2TP sessions go down during ISSU. [Defect ID 187195]

## Multicast

- The following commands, which appear in IPv6 PIM Data MDT Configuration mode, have never been supported and have been removed from IPv6 PIM Data MDT Configuration mode:

- |                           |                             |
|---------------------------|-----------------------------|
| - ipv6 pim data-mdt       | - mdt-data-timeout          |
| - ipv6 pim join-filter    | - route map                 |
| - ipv6 pim query-interval | - show ipv6 pim data-mdt    |
| - mdt-data-delay          | - tunnel group-address-pool |
| - mdt-data-holdown        | - tunnel source             |

IPv6 PIM Data MDT Configuration mode has also been removed from the CLI. [Defect ID 83791]

## SSC Client

- Memory leak in pending request table of SSC client when REQ transmit fails. [Defect ID 91087]
- Memory leak in the pending request table in SSC client during heavy interface flapping. [Defect ID 91053]

## Subscriber Management

- Primary IP intf is not created for Auto Config VLANs. [Defect ID 91056]

## System

- LC-HA:SRP crash; file: ectionManager.cc(line: 3173) task:cm [Defect ID 176808]
- Line Module goes into inactive state. [Defect ID 90980]

## Errata

This section identifies errors found in the JunosE documentation. These errors are corrected in subsequent releases of the affected documentation.

- The *Resolved Known Problems* section of the *JunosE 10.2.2 Release Notes* failed to mention in the *IP* section that defect ID 90081, High CPU utilization, was fixed in that release.
- The *Release Highlights* section of the *JunosE 10.1.0 Release Notes* failed to state that the ERX7xx models, ERX14xx models, and the ERX310 Broadband Services Router do not support hot-swap of the SRP IOA.
- The Physical and Logical Density Maximums table (for the E120 and E320 routers) in *Appendix A, System Maximums* of the *JunosE Release Notes*, for the following releases incorrectly contained a note stating that you could install the ES2 10G ADV LM in either of the E320 router turbo slots (2 and 4) with a 100 Gbps fabric configuration on the E320 router.
  - Release 10.1.x
  - Releases 10.2.0, 10.2.1, and 10.2.2
  - Releases 10.3.0, 10.3.1, and 10.3.2
  - Releases 11.0.0, 11.0.1, and 11.0.2
  - Releases 11.1.0 and 11.1.1

The ES2 10G ADV LM cannot be installed in any of the slots with a 100 Gbps fabric configuration on an E320 router. You can configure the ES2 10G ADV LM with only the following module combinations:

- 120 Gbps fabric configuration on the E120 router
- 320 Gbps fabric configuration on the E320 router
- In the Module Combinations table in *E120 and E320 Hardware Guide, Chapter 4, Installing Modules*, the SFM-100 row incorrectly indicates that this SFM can be paired with the ES2 10G ADV line module. The SFM-100 module is not compatible with an E320 router that contains an ES2 10G ADV LM.

Also, the SFM-120 and SFM-320 rows erroneously fail to mention that these SFM modules can be paired with the ES2 10G ADV LM. The SFM-120 module can be installed with an ES2 10G ADV LM on an E120 router in slots numbered 0-5 and the SFM-320 module can be installed with an ES2 10G ADV LM on an E320 router in slots numbered 0-5 and 11-16.

- The *Environmental Requirements and Cabling Recommendations* sections in *Appendix B, Installation Guidelines and Requirements*, of the *E120 and E320 Hardware Guide* fail to mention that, based on the optical fiber cables used, you may need to increase the physical space provided for the chassis. The strain relief and bend radius requirements of the optical fiber cables may exceed the specified depth of the chassis and the cable-management bracket.

- The *ERX Module Guide* and the *E120 and E320 Module Guide* incorrectly include information about the following end-of-life (EOL) modules, which can no longer be ordered for ERX routers, E120 routers, and E320 routers:

| Module Name  | Module Type   |
|--|---------------|
| cOC3/STM1 multimode  | ERX           |
| cOC3/STM1 single-mode intermediate reach                             | ERX           |
| cOC3/STM1 single-mode long reach                                     | ERX           |
| cOC12/STM4 multimode without APS/MSP redundancy                      | ERX           |
| cOC12/STM4 single-mode intermediate reach without APS/MSP redundancy | ERX           |
| cOC12/STM4 single-mode intermediate reach with APS/MSP redundancy    | ERX           |
| cOC12/STM4 single-mode long reach                                    | ERX           |
| CT3/T3 12 (12 ports)   | ERX           |
| E3 Frame (12 ports)  | ERX           |
| IPSec Service Module   | ERX           |
| SRP 5G+ (2 GB)   | ERX           |
| T3 Frame (12 ports)  | ERX           |
| 10GE IOA   | E120 and E320 |

- The following corrections and additions apply to the LM 10 ADV Line Module table in the *E120 and E320 Module Guide*:
  - The Description row fails to mention that you can use the ES2 10G ADV LM with an SRP-120 configuration and that you can install it in any slot.
  - The Capability row incorrectly states that for the ES2 10G ADV LM, the 100-Gbps switch fabric allocates 3.4 Gbps of overall bandwidth to each regular LM slot and 10 Gbps of overall bandwidth to each of the turbo slots (slot 2 and slot 4). However, the correct compatibility setting is that the ES2 10G ADV LM cannot be paired with a 100-Gbps switch fabric. You can use this LM only with SRP-120 and SFM-120 modules on an E120 router and with SRP-320 and SFM-320 modules on an E320 router.  
 Also, the Capability row fails to mention that when you use the ES2 10G ADV LM with an SFM-120 module, the 120-Gbps switch fabric allocates 10 Gbps of overall bandwidth to each LM slot.
  - The SRP module compatibility row fails to mention that you can use the ES2 10G ADV LM with an SRP-120 module.
- The Line module compatibility row in the SRP 100 Module and SFM 100 Module tables of the *E120 and E320 Module Guide* incorrectly mentions that the ES2 10G ADV LM (only in turbo slots) can be installed with the SRP-100 and SFM-100 modules. The ES2 10G ADV LM is not compatible with both the SRP-100 and SFM-100 modules.
- The Line module compatibility row in the SRP 120 Module and SFM 120 Module tables of the *E120 and E320 Module Guide* fails to list the ES2 10G ADV LM as one of the LMs that can interoperate and be paired with the SRP-120 and SFM-120 modules.

- The *ERX7xx Models, ERX14xx Models, and the ERX310 Broadband Services Router* section of *JunosE System Basics Configuration Guide, Chapter 6, Managing Modules* failed to mention that the ERX7xx models, ERX14xx models, and the ERX310 Broadband Services Router do not support hot-swap of the SRP IOA.
- The *show clns interface* section in *JunosE IP, IPv6, and IGP Configuration Guide, Chapter 6, Configuring IS-IS*, incorrectly indicates that LDP-IGP Synchronization is supported only for OSPFv2. In fact, LDP-IGP Synchronization is supported for IS-IS.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 4861—Neighbor Discovery for IP Version 6 (IPv6) (September 2007). RFC 4861 obsoletes RFC 2461—Neighbor Discovery for IP Version 6 (IPv6) (December 1998). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 4862—IPv6 Stateless Address Autoconfiguration (September 2007). RFC 4862 obsoletes RFC 2462—IPv6 Stateless Address Autoconfiguration (December 1998). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 4760—Multiprotocol Extensions for BGP-4 (January 2007). RFC 4760 obsoletes RFC 2858—Multiprotocol Extensions for BGP-4 (June 2000). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 4007—IPv6 Scoped Address Architecture (March 2005). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 4193—Unique Local IPv6 Unicast Addresses (October 2005). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 2526—Reserved IPv6 Subnet Anycast Addresses (March 1999). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 5072—IP Version 6 over PPP (September 2007). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 5187—OSPFv3 Graceful Restart (June 2008). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.
- *JunosE System Basics Configuration Guide, Appendix B, References*, fails to list RFC 5308—Routing IPv6 with IS-IS (October 2008). Since the publication of the RFC, the JunosE Software has been compliant with the updated RFC.

- The *Monitoring SONET/SDH Interfaces* section in *JunosE Physical Layer Configuration Guide, Chapter 3, Configuring Unchannelized OCx/STMx Interfaces*, and the *Monitoring Interfaces* section in *Chapter 4, Configuring Channelized OCx/STMx Interfaces*, incorrectly display the field description of the "time since last status change" field as "time since the module was rebooted" for the **show controllers sonet** and **show controllers sonet configuration** commands.

The correct field description is "time the controller has been in the current physical state" for all four instances.

- The *ES2 10G ADV LM Combination* section in *JunosE Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces* incorrectly states the following:

With a 100 Gbps fabric configuration, the E320 router can accommodate up to 2 combinations of ES2 10G ADV LMs and ES2-S3 GE-20 IOAs. You must install a combination in either of the turbo slots (slot 2 or slot 4). The 100 Gbps allocates 10 Gbps of overall bandwidth to each of these slots.

The correct compatibility configuration is that you cannot install an ES2 10G ADV LM in any of the slots with a 100 Gbps fabric configuration on an E320 router. You can configure the ES2 10G ADV LM with only the following module combinations:

- 120 Gbps fabric configuration on the E120 router
- 320 Gbps fabric configuration on the E120 and E320 routers

- The *Configuring a Profile* section of *JunosE Link Layer Configuration Guide, Chapter 17, Configuring Dynamic Interfaces*, incorrectly mentions the **pppoe motm** command as the **pppoe mtu** command.

The command name is now replaced with the **pppoe motm** command. Also, the description of the **pppoe motm** command is updated with additional information.

- In the *Configuring a Profile* section in *JunosE Link Layer Configuration Guide, Chapter 17, Configuring Dynamic Interfaces*, the **ppp authentication** command section erroneously omits the following information from the list of guidelines:

If the VR specified in a profile with the **ipv6 virtual-router** command differs from the VR provided by AAA, IPv6 uses the VR provided by AAA when the dynamic IPv6 upper-layer interface is created.

- In the *Monitoring IGMP* section in *JunosE Multicast Routing Configuration Guide, Chapter 2, Configuring IGMP*, the bulleted list of field descriptions and output example for the **show ip igmp interface** command incorrectly display the field name for the number of multicast groups that the interface has discovered as "Groups learned". The correct label for this field is "Groups learnt".

- In the *Monitoring MLD* section in *JunosE Multicast Routing Configuration Guide, Chapter 6, Configuring Multicast Listener Discovery*, the following corrections apply to the commands used to monitor MLD configuration:

- In the **show ipv6 mld** command section, the field name "learned groups" (which denotes the number of multicast groups that the virtual router has discovered) in the bulleted list of field descriptions and output example for this command is incorrect. The correct field name for this setting is "learnt groups".
- In the **show ipv6 mld interface** command section, the field name "Groups learned" (which denotes the number of multicast groups that the interface has discovered) in the bulleted list of field descriptions and output example for this command is incorrect. The correct field name for this setting is "Groups learnt".

- In the *Example: Aggregate Marking with Oversubscription Rate-Limiting Hierarchical Policy* section in *Chapter 5, Creating Rate-Limit Profiles* of the *JunosE Policy Management Configuration Guide*, the references to the sample ToS values marked for color coded traffic packets in the description, the command examples, and the figure are incorrect. In this section, the sample values that can be configured for ToS marks, using the **green-mark**, **yellow-mark**, and **red-mark** commands, are specified as a string of characters. The correct ToS marks that can be configured for color-coded packets using these commands are of the numerical format (a value in the range 0–255).

See *Appendix B, Applying a ToS Mark to Color-Coded Packets in Aggregate Rate-Limit Hierarchical Policies*, in these *Release Notes* for updated information.

- In the *Attaching a QoS Profile to an ATM VP* section in *JunosE Quality of Service Configuration Guide, Chapter 16, Configuring and Attaching QoS Profiles to an Interface*, the following information about the attachment of QoS profiles to ATM interfaces is missing:

If you attempt to modify the QoS profile attached to an ATM VP that contains nonbroadcast multiaccess (NBMA) or multipoint interfaces from profileA to profileB by using the **atm-vp qos-profile** command for a specific VP on that interface, the command is configured correctly and no error message is displayed in the CLI interface. However, the shaping rate on the interfaces that are part of the ATM VP is not properly updated with the shaping rate specified in profileB. Instead, the multipoint interfaces remain configured with the shaping rate set in profileA.

To modify the QoS profile currently attached to ATM VPs that contain NBMA or multipoint interfaces from another profile, you must first remove the QoS profile attached to the interfaces by using the **no atm-vp qos-profile** command in Interface Configuration mode, and then attach the new QoS profile to the interfaces by using the **atm-vp qos-profile** command. This restriction exists because the mungeing of QoS profiles does not occur correctly if any of the attributes of ATM VPs with multipoint interfaces are modified.

If you modify the QoS profile attached to a point-to-point ATM interface from profileA to profileB by using the **qos-profile** command (or the **atm-vp qos-profile** command for a specific VP on the ATM interface) in Interface Configuration mode, the shaping rate is correctly configured on the interface and is modified with the value specified in profileB.

To modify the QoS profile attached to an ATM VP that contains an NBMA or a multipoint interface from profileA to profileB, perform the following steps. These steps assume that profileA and profileB have been previously configured on the router.

1. Enter Interface Configuration mode for the ATM VP.

```
host1(config)#interface atm 1/0
```

2. Remove the QoS profile, profileA, currently attached to the ATM VP that contains the NBMA interface.

```
host1(config-if)#no atm-vp 1 qos-profile profileA
```

3. Attach the new QoS profile, profileB, that you want to be attached to the ATM VP that contains the NBMA interface.

```
host1(config-if)#atm-vp 1 qos-profile profileB
```

- The *IP Hinting* section in *JunosE Broadband Access Configuration Guide, Chapter 1, Configuring Remote Access* inadvertently omits the following information about AAA domain map support for IPv4 that enables you to configure additional virtual router assignment capabilities for IPv4 subscribers:

AAA domain map support for IPv4 enables you to provide additional virtual router assignment capabilities for IPv4 subscribers. If you assign a value other than default to a layer 2 virtual router, then the access, IPv4, and IPv6 virtual routers are all assigned the same value, which cannot be changed. If you use RADIUS redirect to assign virtual routers, you can assign access, IPv4, and IPv6 to the redirection target.

Use the **auth-router-name** command in Domain Map Configuration mode to assign an access virtual router. The **no** version restores the default router. An example of the **auth-router-name** command is as follows:

```
host1(config)#aaa domain-map xyz.com
host1(config-domain-map)#auth-router-name accessvr
```



**Informational Note:** The **auth-router-name** command replaces the **router-name** command, which has been deprecated and may be removed completely in a future release.

Use the **ip-router-name** command in Domain Map Configuration mode to assign an IPv4 virtual router. The **no** version restores the default router. An example of the **ip-router-name** command is as follows:

```
host1(config)#aaa domain-map xyz.com
host1(config-domain-map)#ip-router-name ipv4vr
```



**Informational Note:** The **ip-router-name** command replaces the **router-name** command, which has been deprecated and may be removed completely in a future release.

- The following information was erroneously omitted from the *Generating UDP Checksums in Packets to L2TP Peers* section of *Chapter 12, Configuring an L2TP LAC*, of the *JunosE Broadband Access Configuration Guide* for Release 11.1.x and Release 11.2.x:
 

L2TP checksum generation support is available on an ES2 10G Uplink LM and an ES2 4G LM only. It is not supported on an ES2 10G LM and an ES2 10G ADV LM. If an ES2 10G LM or an ES2 10G ADV LM is present when L2TP checksum is enabled, the checksum is not calculated and its value is set to zero.
- The description of the **ip route** command in the *JunosE Command Reference Guide A to M* incorrectly states that this command is available in VRF Configuration mode. The **ip route** command is available only in Global Configuration mode.
- In the *JunosE Command Reference Guide A to M*, the description of the **mpls ldp graceful-restart reconnect-time** command incorrectly states that the **no** version restores the default value of 120 seconds. The correct default value is 140 seconds.

- The *JunosE Command Reference Guide N to Z* omits the description of the **show memory-management protection** command, beginning with JunosE Release 7.1.0 in which it was introduced.

The **show memory-management protection** command is available in Privileged Exec mode. You can use this command to display the information about memory management protection of the router.

The syntax for this command is:

```
show memory-management protection [ detail ] [ filter ]
```

The command can be used only in the support mode and is not user configurable.

- In the *JunosE System Event Logging Reference Guide*, for the **radiusClient** event category, the Error field incorrectly includes the following errors:
  - Internal allocation error of base RADIUS server table
  - Invalid virtual router for user's context

These errors were never implemented in any version of JunosE Software.



## Appendix A

# System Maximums

This appendix presents current system maximums for various E Series hardware configurations. An E Series router does not simultaneously support all maximum configurations.

For some entries, early field trial (EFT) values are presented in addition to supported values. These values have not been fully qualified by Juniper Networks and are mentioned only for field test purposes in this release. EFT values are enclosed within parentheses with an EFT designation; for example, (96,000 EFT).

Modules referred to in the tables are identified by their physical label. For module specifications, including their identifying labels, see *ERX Module Guide, Table 1, Module Combinations* and *E120 and E320 Module Guide, Table 1, Modules and IOAs*.

| System Maximums for ERX310, ERX7xx, and ERX14xx | Section   |
|---|---|
| General router values                           | <i>General System Maximums</i> on page 64               |
| Physical layer values                           | <i>Physical and Logical Density Maximums</i> on page 65 |
| Link layer values                               | <i>Link Layer Maximums</i> on page 68                   |
| Routing protocol and performance values         | <i>Routing Protocol Maximums</i> on page 73             |
| Policy and QoS values                           | <i>Policy and QoS Maximums</i> on page 76               |
| Tunneling values                                | <i>Tunneling Maximums</i> on page 78                    |
| Subscriber management values                    | <i>Subscriber Management Maximums</i> on page 80        |

| System Maximums for E120 and E320 Routers | Section   |
|---|---|
| General router values                     | <i>General System Maximums</i> on page 82               |
| Physical layer values                     | <i>Physical and Logical Density Maximums</i> on page 83 |
| Link layer values                         | <i>Link Layer Maximums</i> on page 85                   |
| Routing protocol and performance values   | <i>Routing Protocol Maximums</i> on page 90             |
| Policy and QoS values                     | <i>Policy and QoS Maximums</i> on page 93               |
| Tunneling values                          | <i>Tunneling Maximums</i> on page 97                    |
| Subscriber management values              | <i>Subscriber Management Maximums</i> on page 99        |

## ERX310, ERX7xx, and ERX14xx System Maximums

The following tables provide system maximums for the ERX310, ERX7xx, and ERX14xx routers.

### General System Maximums

Table 1 lists some general system maximums for the ERX routers.

**Table 1: General System Maximums**

| Feature  | ERX310  | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|--|---------|----------------------|---------|---------|
| Fabric size  | 10 Gbps | 5 or 10 Gbps         | 10 Gbps | 40 Gbps |
| Chassis per 7-foot rack  | 14      | 6                    | 3       | 3       |
| NTP clients  | 1000    | 1000                 | 1000    | 1000    |
| NTP servers  | 300     | 300                  | 300     | 300     |
| Sessions per chassis (simultaneous Telnet + FTP + SSH, in any combination) | 30      | 30                   | 30      | 30      |
| Virtual routers per chassis  | 1000    | 1000                 | 1000    | 1000    |
| Virtual routers per line module ASIC                                       | 1000    | 1000                 | 1000    | 1000    |
| ICR Partitions per chassis   | 640     | 640                  | 640     | 640     |
| ICR Partitions per line module   | 64      | 64                   | 64      | 64      |

## Physical and Logical Density Maximums

Table 2 lists physical and logical density maximums for the ERX routers. The following notes are referred to in Table 2:

1. Wire rate indicates the port density that supports maximum (wire-rate) performance. Oversubscribed indicates the port density possible when you are willing to accept less than wire-rate performance by oversubscribing the available fabric bandwidth. The ERX310 and ERX1440 routers do not support oversubscription; port densities for these models indicate wire-rate performance.
2. When you pair the GE-2 or GE-HDE line module with the GE-2 SFP I/O module on the ERX1440 router, you can terminate up to 24 Gigabit Ethernet interfaces. Slots 2 and 4 on the ERX1440 router support two Gigabit Ethernet interfaces at wire rate; the remaining 10 slots support one Gigabit Ethernet interface at wire rate. On the ERX310 router, all four ports (active and redundant) are at wire rate.

For more information about bandwidth and line-rate considerations for the GE-2 line module or the GE-HDE line module and their corresponding I/O modules on E Series routers, see *JunosE Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces*.

3. When you pair the GE-HDE line module with the GE-8 I/O module on the ERX1440 router, you can terminate up to 96 Gigabit Ethernet interfaces. Slots 2 and 4 on the ERX1440 router support two Gigabit Ethernet interfaces at wire rate; the remaining 10 slots support one Gigabit Ethernet interface at wire rate. On the ERX310 router, only two Gigabit Ethernet interfaces per slot are at wire rate; therefore, only four Gigabit Ethernet interfaces are at wire rate for the entire router.

For more information about bandwidth and line-rate considerations for the GE-HDE line module and the GE-8 I/O module on E Series routers, see *JunosE Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces*.

4. The OC3/STM-1 GE/FE line module and OC3-2 GE APS I/O module combination does not support line rate for Gigabit Ethernet interfaces.

**Table 2: Physical and Logical Density Maximums**

| Feature   | ERX310 | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|--------|----------------------|---------|---------|
| <b>Physical density wire rate/oversubscribed</b>                                |        |                      |         |         |
| (See Note 1 on page 65.)  |        |                      |         |         |
| Channelized OC3 ports per chassis<br>(cOC3 STM1 FO I/O modules)                 | 8      | 16/20                | 32/48   | 48      |
| Channelized OC12 ports per chassis<br>(cOC12 STM4 FO I/O modules)               | 2      | 4/5                  | 4/12    | 12      |
| Channelized T3 ports per chassis<br>(CT3/T3 12 I/O modules)                     | 24     | 48/60                | 96/144  | 144     |
| E3 (unchannelized) ports per chassis<br>(CT3/T3 12 I/O modules)                 | 24     | 48/60                | 96/144  | 144     |
| Fast Ethernet (10/100) ports per chassis<br>(FE-8 I/O and FE-8 SFP I/O modules) | 16     | 32/40                | 32/96   | 96      |
| Gigabit Ethernet ports per chassis<br>(GE I/O modules)                          | 2      | 4/5                  | 4/12    | 12      |

**Table 2: Physical and Logical Density Maximums Table continued**

| Feature   | ERX310             | ERX705 and<br>ERX710 | ERX1410            | ERX1440            |
|---|--------------------|----------------------|--------------------|--------------------|
| Gigabit Ethernet ports per chassis<br>(GE-2 SFP I/O modules)<br>(See Note 2 on page 65.)                    | 4                  | –                    | –                  | 14/24              |
| Gigabit Ethernet ports per chassis<br>(GE-8 I/O modules)<br>(See Note 3 on page 65.)                        | 4/16               | –                    | –                  | 14/96              |
| Gigabit Ethernet ports per chassis<br>(OC3-2 GE APS I/O module)<br>(See Note 4 on page 65.)                 | 2                  | 4/5                  | 4/12               | 12                 |
| OC3/STM-1 ATM ports per chassis<br>(OC3-4 I/O modules)  | 8                  | 16/20                | 32/48              | 48                 |
| OC3/STM-1 ATM ports per chassis<br>(OC3-2 GE APS I/O module)  | 4                  | 10                   | 24                 | 24                 |
| OC3/STM-1 POS ports per chassis<br>(OC3-4 I/O modules)  | 8                  | 16/20                | 16/48              | 48                 |
| OC12/STM-4 ATM ports per chassis<br>(OC12 STM4 I/O modules)   | 2                  | 4/5                  | 8/12               | 12                 |
| OC12/STM-4 POS ports per chassis<br>(OC12 STM4 I/O modules)   | 2                  | 4/5                  | 4/12               | 12                 |
| OC48/STM16 POS ports per chassis<br>(OC48 FRAME I/O modules); ERX1440 router only                           | –                  | –                    | –                  | 2                  |
| T3 (unchannelized) ports per chassis<br>(4xDS3 ATM I/O modules)   | 8                  | 16/20                | 32/48              | 48                 |
| T3 (unchannelized) ports per chassis<br>(CT3/T3 12 I/O modules)   | 24                 | 48/60                | 96/144             | 144                |
| <b>Logical density per chassis</b>  |                    |                      |                    |                    |
| Logical EIs per chassis   | 504                | 1260                 | 3024               | 3024               |
| Logical E3s per chassis   | 24                 | 60                   | 144                | 144                |
| Logical fractional EIs (DS0) per chassis  | 4000               | 10,000               | 24,000             | 24,000             |
| Logical fractional T1s (DS0) per chassis  | 4000               | 10,000               | 24,000             | 24,000             |
| Logical OC3/STM1 per chassis  | 8                  | 20                   | 48                 | 48                 |
| Logical OC12/STM4 per chassis   | 2                  | 5                    | 12                 | 12                 |
| Logical OC48/STM16 per chassis<br>(ERX1440 router only)   | –                  | –                    | –                  | 2                  |
| Logical T1s per chassis   | 672                | 1680                 | 4032               | 4032               |
| Logical T3s per chassis   | 24                 | 60                   | 144                | 144                |
| <b>Logical density per module combination<br/>(specified line module and all supported I/O<br/>modules)</b> |                    |                      |                    |                    |
| Logical EIs per cOCx/STMx F0 line module  | 252                | 252                  | 252                | 252                |
|   | 63 per<br>OC3/STM1 | 63 per<br>OC3/STM1   | 63 per<br>OC3/STM1 | 63 per<br>OC3/STM1 |
| Logical E3s per COCX-F3 line module   | 12                 | 12                   | 12                 | 12                 |

**Table 2: Physical and Logical Density Maximums Table continued**

| Feature   | ERX310                      | ERX705 and<br>ERX710        | ERX1410                     | ERX1440                     |
|---|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Logical fractional E1s (DS0) per cOCx/STMx F0 line module                 | 2000<br>500 per<br>OC3/STM1 | 2000<br>500 per<br>OC3/STM1 | 2000<br>500 per<br>OC3/STM1 | 2000<br>500 per<br>OC3/STM1 |
| Logical fractional T1s (DS0) per cOCx/STMx F0 line module                 | 2000<br>500 per<br>OC3/STM1 | 2000<br>500 per<br>OC3/STM1 | 2000<br>500 per<br>OC3/STM1 | 2000<br>500 per<br>OC3/STM1 |
| Logical fractional T1s (DS0) per CT3/T3-F0 line module                    | 1992<br>166 per T3          | 1992<br>166 per T3          | 1992<br>166 per T3          | 1992<br>166 per T3          |
| Logical fractional T3s (DS3) per COCX-F3 line module                      | 12                          | 12                          | 12                          | 12                          |
| Logical T1s per cOCx/STMx F0 line module                                  | 336<br>84 per<br>OC3/STM1   | 336<br>84 per<br>OC3/STM1   | 336<br>84 per<br>OC3/STM1   | 336<br>84 per<br>OC3/STM1   |
| Logical T1s per CT3/T3-F0 line module                                     | 336<br>28 per T3            | 336<br>28 per T3            | 336<br>28 per T3            | 336<br>28 per T3            |
| Logical T3s per COCX-F3 line module                                       | 12                          | 12                          | 12                          | 12                          |
| Logical T3s per cOCx/STMx F0 line module                                  | 12<br>3 per OC3/STM1        | 12<br>3 per OC3/STM1        | 12<br>3 per OC3/STM1        | 12<br>3 per OC3/STM1        |
| Logical T3s per CT3/T3-F0   | 12                          | 12                          | 12                          | 12                          |
| Logical T3s per OCx/STMx/DS3-ATM line module with<br>4xDS3 ATM I/O module | 4                           | 4                           | 4                           | 4                           |

## Link Layer Maximums

Table 3 lists link layer maximums for the ERX routers. The following notes are referred to in Table 3:

1. The ERX1440 router supports a maximum of 48,000 interface columns of all types combined. You can use either all dynamic interfaces or a combination of dynamic and static interfaces to achieve this maximum. For bridged Ethernet, IP network, and PPP interfaces, the ERX1440 router supports a maximum of 32,000 static major interfaces. Although the ERX1440 router supports a maximum of 48,000 static major interfaces for PPPoE, the PPPoE static limit is enforced at the subinterface level, which has a limit of 32,000.

The ERX705, ERX710, and ERX1410 routers support a maximum of 32,000 interfaces of all types combined; the ERX310 router supports a maximum of 16,000 interfaces of all types combined. For these routers, the interfaces can be any combination of dynamic or static.

The JunosE Software supports up to 10,000 PPP interfaces with EAP authentication negotiation configured. Performance and scalability is unchanged when EAP is not configured.

2. The total maximum number of Ethernet subinterfaces that can be active at any one time on an ERX310 router, an ERX7xx router, or an ERX14xx router is limited by the number of slots per chassis. Of this total, you can configure all single-tagged VLAN subinterfaces, all double-tagged S-VLAN subinterfaces, or a combination of both VLAN subinterfaces and S-VLAN subinterfaces to achieve this maximum.

**Table 3: Link Layer Maximums**

| Feature  | ERX310        | ERX705 and<br>ERX710 | ERX1410       | ERX1440       |
|--|---------------|----------------------|---------------|---------------|
| <b>ARP entries per line module</b>                                       |               |                      |               |               |
| Dynamic ARP entries  | 32,768        | 32,768               | 32,768        | 32,768        |
| Static ARP entries   | 32,768        | 32,768               | 32,768        | 32,768        |
| Total ARP entries  | 32,768        | 32,768               | 32,768        | 32,768        |
| <b>ATM bulk configuration VC ranges per chassis</b>                      |               |                      |               |               |
|  | 300           | 300                  | 300           | 300           |
| <b>ATM bulk configuration VC ranges per line module</b>                  |               |                      |               |               |
|  | 300           | 300                  | 300           | 300           |
| <b>ATM bulk configuration total VCs per chassis</b>                      |               |                      |               |               |
|  | 64,000        | 160,000              | 384,000       | 384,000       |
| <b>ATM bulk configuration total VCs per line module</b>                  |               |                      |               |               |
| OCx/STMx/DS3-ATM   | 32,000        | 32,000               | 32,000        | 32,000        |
| OC3/STM1 GE/FE   | 32,000        | 32,000               | 32,000        | 32,000        |
| <b>ATM bulk configuration overriding profile assignments per chassis</b> |               |                      |               |               |
|  | 100           | 100                  | 100           | 100           |
| <b>ATM VCs per chassis (active/configured)</b>                           |               |                      |               |               |
|  | 16,000/32,000 | 32,000/64,000        | 32,000/64,000 | 48,000/96,000 |

**Table 3: Link Layer Maximums Table continued**

| Feature   | ERX310      | ERX705 and<br>ERX710 | ERX1410     | ERX1440     |
|---|-------------|----------------------|-------------|-------------|
| <b>ATM VCs per line module</b>  |             |                      |             |             |
| OCx/STMx/DS3-ATM (active/configured)  | 8000/16,000 | 8000/16,000          | 8000/16,000 | 8000/16,000 |
| OC3/STM1 GE/FE (active/configured)  | 8000/16,000 | 8000/16,000          | 8000/16,000 | 8000/16,000 |
| <b>ATM VCs per port</b>   |             |                      |             |             |
| OCx/STMx/DS3-ATM (active/configured)  | 8000/16,000 | 8000/16,000          | 8000/16,000 | 8000/16,000 |
| OC3/STM1 GE/FE (active/configured)  | 8000/16,000 | 8000/16,000          | 8000/16,000 | 8000/16,000 |
| <b>ATM VC classes per chassis</b>   | 100         | 100                  | 100         | 100         |
| <b>ATM VP/VC addresses per line module</b>  |             |                      |             |             |
| OCx/STMx/DS3-ATM  | 20-bit      | 20-bit               | 20-bit      | 20-bit      |
| OC3/STM1 GE/FE  | 20-bit      | 20-bit               | 20-bit      | 20-bit      |
| <b>ATM VP tunnels per port, all supported modules</b>   | 256         | 256                  | 256         | 256         |
| <b>Bridged Ethernet interfaces per chassis</b><br>(See Note 1 on page 68.)                                  | 16,000      | 32,000               | 32,000      | 48,000      |
| <b>Bridged Ethernet interfaces per line module</b>  |             |                      |             |             |
| OCx/STMx/DS3-ATM  | 8192        | 8192                 | 8192        | 8192        |
| OC3/STM-1 GE/FE   | 8192        | 8192                 | 8192        | 8192        |
| <b>Dynamic interfaces</b>   |             |                      |             |             |
| Active autosensed dynamic interface columns per chassis over static or dynamic (bulk) ATM1483 subinterfaces | 16,000      | 32,000               | 32,000      | 48,000      |
| <b>Ethernet 802.3ad Link Aggregation</b>  |             |                      |             |             |
| Links per LAG (bundle)  | 8           | 8                    | 8           | 8           |
| LAGs (bundles) per chassis  | 64          | 64                   | 64          | 64          |
| <b>Ethernet S-VLANs per chassis</b><br>(See Note 2 on page 68.)   | 32,768      | 81,920               | 96,000      | 96,000      |
| <b>Ethernet S-VLANs per I/O module</b>  |             |                      |             |             |
| FE-8 I/O and FE-8 SFP I/O   | 16,384      | 16,384               | 16,384      | 16,384      |
| GE I/O  | 16,384      | 16,384               | 16,384      | 16,384      |
| GE-2 SFP I/O  | 16,384      | –                    | –           | 16,384      |
| GE-8 I/O  | 16,384      | –                    | –           | 16,384      |
| OC3-2 GE APS I/O  | 16,384      | 16,384               | 16,384      | 16,384      |

**Table 3: Link Layer Maximums Table continued**

| Feature   | ERX310 | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|--------|----------------------|---------|---------|
| <b>Ethernet VLANs per chassis</b>                                       | 32,768 | 81,920               | 96,000  | 96,000  |
| (See Note 2 on page 68.)  |        |                      |         |         |
| <b>Ethernet VLANs per I/O module (no more than 4096 VLANs per port)</b> |        |                      |         |         |
| FE-8 I/O and FE-8 SFP I/O   | 8192   | 8192                 | 8192    | 8192    |
| GE I/O  | 4096   | 4096                 | 4096    | 4096    |
| GE-2 SFP I/O  | 8192   | –                    | –       | 8192    |
| GE-8 I/O  | 16,384 | –                    | –       | 16,384  |
| OC3-2 GE APS I/O  | 4096   | 4096                 | 4096    | 4096    |
| <b>Ethernet VLAN bulk configuration VLAN ranges per chassis</b>         | 300    | 300                  | 300     | 300     |
| <b>Ethernet VLAN bulk configuration VLAN ranges per line module</b>     | 300    | 300                  | 300     | 300     |
| <b>Ethernet VLAN overriding profile assignments per chassis</b>         | 200    | 200                  | 200     | 200     |
| <b>Ethernet VRRP VRIDs per line module ASIC</b>                         | 800    | 800                  | 800     | 800     |
| <b>Frame Relay virtual circuits per chassis</b>                         | 2000   | 5000                 | 12,000  | 12,000  |
| <b>Frame Relay virtual circuits per line module</b>                     |        |                      |         |         |
| COCX-F3   | 1000   | 1000                 | 1000    | 1000    |
| cOCx/STMx F0  | 1000   | 1000                 | 1000    | 1000    |
| OC48 (ERX1440 router only)  | –      | –                    | –       | 1000    |
| <b>Frame Relay virtual circuits per port</b>                            |        |                      |         |         |
| COCX-F3   | 1000   | 1000                 | 1000    | 1000    |
| cOCx/STMx F0  | 1000   | 1000                 | 1000    | 1000    |
| OC48 (ERX1440 router only)  | –      | –                    | –       | 1000    |
| <b>HDLC interfaces per chassis</b>                                      | 4000   | 10,000               | 24,000  | 24,000  |
| <b>HDLC interfaces per line module</b>                                  |        |                      |         |         |
| COCX-F3   | 12     | 12                   | 12      | 12      |
| cOCx/STMx F0  | 2000   | 2000                 | 2000    | 2000    |
| CT3/T3 F0   | 1992   | 1992                 | 1992    | 1992    |
| OCx/STMx/DS-3 ATM   | 8000   | 8000                 | 8000    | 8000    |
| OCx/STMx POS  | 4      | 4                    | 4       | 4       |
| OC48 (ERX1440 router only)  | –      | –                    | –       | 1       |

**Table 3: Link Layer Maximums Table continued**

| Feature   | ERX310   | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|--|----------------------|---------|---------|
| <b>MLFR bundles per chassis</b>   | 5000   | 5000                 | 5000    | 5000    |
| <b>MLFR bundles per line module</b>   | Bundles per line module are limited only by the availability of interface columns on the module. Because a bundle requires at least one interface column, the number of bundles cannot exceed the number of interface columns.   |                      |         |         |
| <b>MLPPP bundles per chassis</b>  | 12,000   | 12,000               | 12,000  | 12,000  |
| <b>MLPPP bundles per line module</b>  | The maximum number of MLPPP bundles supported per line module is the lesser of the maximum number of MLPPP bundles supported per chassis or of the maximum number of interfaces supported on the line module. For more information, see the <i>JunosE Link Layer Configuration Guide</i> . |                      |         |         |
| <b>PPP interfaces per chassis</b><br>(See Note 1 on page 68.)                             | 16,000   | 32,000               | 32,000  | 48,000  |
| <b>PPP interfaces per line module</b>   |  |                      |         |         |
| COCX-F3   | 12   | 12                   | 12      | 12      |
| cOCx/STMx FO  | 2000   | 2000                 | 2000    | 2000    |
| GE/FE   | 8000   | 8000                 | 8000    | 8000    |
| GE-2  | 8000   | –                    | –       | 8000    |
| GE-HDE  | 8000   | –                    | –       | 8000    |
| OCx/STMx/DS-3 ATM   | 8000   | 8000                 | 8000    | 8000    |
| OC3/STM-1 GE/FE   | 8000   | 8000                 | 8000    | 8000    |
| OCx/STMx POS  | 4  | 4                    | 4       | 4       |
| OC48 (ERX1440 router only)  | –  | –                    | –       | 1       |
| <b>PPP packet logging</b>   |  |                      |         |         |
| Aggregate dynamic and static PPP interfaces for which you can log PPP packets per chassis | 32   | 32                   | 32      | 32      |
| <b>PPPoE service name tables</b>  |  |                      |         |         |
| PPPoE service name tables per chassis   | 16   | 16                   | 16      | 16      |
| Service name tags per PPPoE service name table (including one empty service name tag)     | 17   | 17                   | 17      | 17      |
| <b>PPPoE subinterfaces</b>  |  |                      |         |         |
| Subinterfaces per chassis<br>(See Note 1 on page 68.)                                     | 16,000   | 32,000               | 32,000  | 48,000  |
| Subinterfaces per GE/FE line module   | 8000   | 8000                 | 8000    | 8000    |
| Subinterfaces per GE-2 line module  | 8000   | –                    | –       | 8000    |
| Subinterfaces per GE-HDE line module  | 8000   | –                    | –       | 8000    |

**Table 3: Link Layer Maximums Table continued**

| Feature  | ERX310 | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|--|--------|----------------------|---------|---------|
| Subinterfaces per OCx/STMx/DS-3 ATM line module  | 8000   | 8000                 | 8000    | 8000    |
| Subinterfaces per OC3/STM-1 GE/FE line module  | 8000   | 8000                 | 8000    | 8000    |
| <b>Transparent bridging and VPLS</b>   |        |                      |         |         |
| Bridge groups or VPLS instances per chassis  | 1024   | 1024                 | 1024    | 1024    |
| Bridge interfaces per line module in bridge groups or VPLS instances                       | 8000   | 8000                 | 8000    | 8000    |
| Bridge interfaces per chassis in bridge groups or VPLS instances                           | 16,000 | 32,000               | 32,000  | 32,000  |
| Learned MAC address entries combined for all bridge groups and VPLS instances on a chassis | 64,000 | 64,000               | 64,000  | 64,000  |

## Routing Protocol Maximums

Table 4 lists routing protocol maximums for the ERX routers. The following notes are referred to in Table 4:

1. The total set of FTEs can be shared by interfaces, next hops, ECMP sets, VRs, and VRFs. Next-hop FTEs identify the next hop on multiaccess media, such as ATM multipoint, Ethernet, or bridged Ethernet. Each VR or VRF consumes three entries. Each interface, next hop, and ECMP set consumes a single entry. One FTE is reserved for internal use, and the system software limits the number of FTEs used by interfaces to a maximum of 32,000. The remaining FTEs can be shared across the other types.
2. The ERX1440 router supports a maximum of 48,000 interfaces of all types combined. You can use either all dynamic interfaces or a combination of dynamic and static interfaces to achieve this maximum. The ERX1440 router supports a maximum of 32,000 static PPP/PPPoE interfaces and a maximum of 36,500 static IP network interfaces. Bridged Ethernet does not enforce a limit so IP interfaces created on Bridged Ethernet can scale to the IP maximum of 36,500. The ERX705, ERX710, and ERX1410 routers support a maximum of 32,000 IP network interfaces; the ERX310 router supports a maximum of 16,000 IP network interfaces. For all these models, the interfaces can be any combination of dynamic or static.
3. These values are subject to limitations on available SRP module memory, which varies according to your router configuration.
4. Depending on your configuration, the router may support more routing table entries or fewer routing table entries than this value. In any case, you can choose to limit the number of routes that can be added to the routing table on a per-VR or per-VRF basis by means of the maximum routes command.
5. The maximum number of ANCP adjacencies can be scaled over a maximum of 100 virtual routers. Fewer ANCP adjacencies can be scaled in configurations with more than 100 virtual routers.
6. This maximum is not valid for Frame Relay. The Frame Relay maximum is 1000 circuits over MPLS per line module, because only 1000 Frame Relay DLCIs are permitted per line module.
7. On the ERX1440 router, you can achieve 32,767 total Martini circuits over ATM or Ethernet interfaces. For all routers, the total Martini can be any combination of external inter-router circuits and internal circuits (local cross-connects).
8. There is no per-VR limit; all multicast routes can be on a single VR or present across multiple VRs.
9. The maximum number of interfaces can be achieved by any combination; for example, two streams each being replicated to 32,768 interfaces; 16,384 streams each being replicated four times; or any other combination.

10. Dynamic values represent typical limits that vary depending on configuration details and actual dynamic behavior. For dynamic values only, multiple server modules (SMs) in a chassis can improve the values as long as the multiple server modules are online and the number of virtual routers configured with NAT is greater than or equal to the number of server modules. If a server module fails, the load is redistributed to the remaining server modules, with a consequent reduction in aggregate capacity.
11. Static and dynamic translations occupy the same table; therefore, the number of static translation entries present in the table reduces the room for dynamic entries.

**Table 4: Routing Protocol Maximums**

| Feature  | ERX310    | ERX705 and<br>ERX710 | ERX1410   | ERX1440   |
|--|-----------|----------------------|-----------|-----------|
| <b>BFD</b>   |           |                      |           |           |
| Sessions per line module   | 50        | 50                   | 50        | 50        |
| <b>ECMP maximum paths to a destination</b>   |           |                      |           |           |
| BGP, IS-IS, MPLS, OSPF, RIP  | 16        | 16                   | 16        | 16        |
| <b>IPv4 forwarding table entries</b><br>(See Note 1 on page 73.)   |           |                      |           |           |
| Chassis with only ASIC modules   | 1,048,576 | 1,048,576            | 1,048,576 | 1,048,576 |
| <b>IP network interfaces (IPv4 and IPv6)</b>   |           |                      |           |           |
| Per chassis<br>(See Note 2 on page 73.)  | 16,000    | 32,000               | 32,000    | 48,000    |
| Per line module ASIC   | 8000      | 8000                 | 8000      | 8000      |
| <b>IPv4 routing protocol scaling and peering densities</b><br>(See Note 3 on page 73.)   |           |                      |           |           |
| Routing table entries<br>(See Note 4 on page 73.)  | 500,000   | 500,000              | 500,000   | 500,000   |
| ANCP Adjacency Scaling<br>(See Note 5 on page 73.)   | 5000      | 5000                 | 5000      | 5000      |
| BGP-4 peering sessions   | 1000      | 1000                 | 1000      | 1000      |
| BGP-4 routes (NLRI)  | 1,500,000 | 1,500,000            | 1,500,000 | 1,500,000 |
| IP next hops (egress FECs) on router with ASIC modules<br>(used to represent the IP addresses of next-hop routers on<br>Ethernet interfaces) | 1,000,000 | 1,000,000            | 1,000,000 | 1,000,000 |
| MPLS next hops (egress FECs) on router with ASIC modules<br>only   | 500,000   | 500,000              | 500,000   | 500,000   |
| MPLS forwarding entries  | 64,000    | 64,000               | 64,000    | 64,000    |
| IS-IS adjacencies  | 150       | 150                  | 150       | 150       |
| IS-IS routes   | 20,000    | 20,000               | 20,000    | 20,000    |
| MPLS LDP LSPs  | 10,000    | 10,000               | 10,000    | 10,000    |
| MPLS RSVP-TE LSPs  | 10,000    | 10,000               | 10,000    | 10,000    |

**Table 4: Routing Protocol Maximums Table continued**

| Feature  | ERX310  | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|--|---|----------------------|---------|---------|
| OSPF adjacencies   | 1000  | 1000                 | 1000    | 1000    |
| OSPF routes  | 25,000  | 25,000               | 25,000  | 25,000  |
| <b>IPv6 routing table entries</b><br>(See Note 3 on page 73.)                    | 50,000  | 50,000               | 50,000  | 50,000  |
| <b>J-Flow statistics</b>   |   |                      |         |         |
| J-Flow-enabled VRs and VRFs, in any combination                                  | 16  | 16                   | 16      | 16      |
| Sampled interfaces per VR or VRF   | 32  | 32                   | 32      | 32      |
| Total sampled Interfaces per chassis   | 512   | 512                  | 512     | 512     |
| <b>Martini circuits for layer 2 services over MPLS</b>                           |   |                      |         |         |
| Total Martini circuits per line module<br>(See Note 6 on page 73.)               | 8000  | 8000                 | 8000    | 8000    |
| Total Martini circuits per chassis<br>(See Note 7 on page 73.)                   | 16,000  | 16,000               | 16,000  | 32,767  |
| External Martini circuits per chassis  | 16,000  | 16,000               | 16,000  | 32,767  |
| Internal Martini circuits (local cross-connects) per chassis                     | 16,000  | 16,000               | 16,000  | 32,767  |
| <b>Multicast routes (IPv4 and IPv6)</b>  |   |                      |         |         |
| Forwarding entries [(S,G) pairs] per chassis<br>(See Note 8 on page 73.)         | 16,384  | 16,384               | 16,384  | 16,384  |
| Outgoing interfaces per chassis<br>(See Note 9 on page 73.)                      | 65,536  | 65,536               | 65,536  | 65,536  |
| <b>Network Address Translation (NAT)</b>   |   |                      |         |         |
| Static translations (simple or extended) per chassis                             | 96,000  | 96,000               | 96,000  | 96,000  |
| Dynamic simple translations (NAT) per SM<br>(See Notes 10 and 11 on page 74.)    | 400,000   | 400,000              | 400,000 | 400,000 |
| Dynamic extended translations (NAPT) per SM<br>(See Notes 10 and 11 on page 74.) | 200,000   | 200,000              | 200,000 | 200,000 |
| <b>Response Time Reporter simultaneous operations per VR</b>                     | 500   | 500                  | 500     | 500     |
| <b>VRRP VRIDs per line module ASIC</b>   | See <i>Ethernet VRRP VRIDs per line module ASIC</i> on page 70. |                      |         |         |

## Policy and QoS Maximums

Table 5 lists policy and QoS maximums for the ERX routers. The following notes are referred to in Table 5:

1. The OC48 line module supports only 131,071 entries. The GE-2 and GE-HDE line modules support only 65,535 entries.
2. For line modules other than the GE-2, GE-HDE, and OC48/STM16 line modules, the router supports two sizes of policies: 8127 policies, each with a maximum of 32 classifiers, and 16,255 policies, each with a maximum of 16 classifiers. A combination of the two sizes of policies is also supported, in which case the total number of policies is between 8127 and 16,255, depending on the actual configuration.
3. The GE-2, GE-HDE, and OC48/STM16 line modules support CAM classifiers instead of hardware policy assignments. For most configurations, each classifier entry in a policy consumes one CAM entry. However, a policy that has only the default classifier consumes no CAM resources. Policies that use CAM hardware classifiers consume one interface attachment resource, regardless of the number of classifier entries in a policy.

**Table 5: Policy and QoS Maximums**

| Feature  | ERX310      | ERX705 and<br>ERX710 | ERX1410     | ERX1440     |
|--|-------------|----------------------|-------------|-------------|
| QoS queues per ASIC line module  | 49,000      | 49,000               | 49,000      | 49,000      |
| QoS profiles configurable per chassis  | 1000        | 1000                 | 1000        | 1000        |
| QoS profile attachments per chassis  | 96,000      | 96,000               | 96,000      | 96,000      |
| QoS profile attachments per ASIC line module   | 16,000      | 16,000               | 16,000      | 16,000      |
| QoS shapers per line module  | 64,000      | 64,000               | 64,000      | 64,000      |
| Classification rules per policy  | 512         | 512                  | 512         | 512         |
| Policy classification (CLACL) entries per line module<br>(See Note 1 on page 76.)  | 256,000     | 256,000              | 256,000     | 256,000     |
| Unique hardware policy assignments per line module for modules other than the GE-2, GE-HDE, and OC48/STM16<br>(See Note 2 on page 76.) | 8127/16,255 | 8127/16,255          | 8127/16,255 | 8127/16,255 |

**Table 5: Policy and QoS Maximums Table continued**

| Feature   | ERX310  | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|---------|----------------------|---------|---------|
| <b>CAM entries</b>  |         |                      |         |         |
| (See Note 3 on page 76.)  |         |                      |         |         |
| GE-2  | 64,000  | –                    | –       | 64,000  |
| GE-HDE  | 64,000  | –                    | –       | 64,000  |
| OC48/STM16  | –       | –                    | –       | 128,000 |
| <b>Policy egress interface attachments<br/>per ASIC line module</b>                         |         |                      |         |         |
| Combined IP and IPv6 interface attachments  | 8191    | 8191                 | 8191    | 8191    |
| Combined ATM, Frame Relay, GRE, L2TP (LNS only), MPLS,<br>and VLAN interface attachments    | 8191    | 8191                 | 8191    | 8191    |
| <b>Policy ingress interface attachments<br/>per ASIC line module</b>                        |         |                      |         |         |
| Combined IP and IPv6 interface attachments on GE-2,<br>GE-HDE, and OC-48/STM16 line modules | 16,383  | –                    | –       | 16,383  |
| Combined IP and IPv6 interface attachments on all other<br>line modules                     | 16,000  | 16,000               | 16,000  | 16,000  |
| Combined ATM, Frame Relay, GRE, L2TP (LNS only), MPLS,<br>and VLAN interface attachments    | 8191    | 8191                 | 8191    | 8191    |
| <b>Rate limiters</b>  |         |                      |         |         |
| Egress per ASIC line module   | 24,575  | 24,575               | 24,575  | 24,575  |
| Ingress per ASIC line module  | 24,575  | 24,575               | 24,575  | 24,575  |
| <b>Policy statistics blocks</b>   |         |                      |         |         |
| Egress per ASIC line module   | 256,000 | 256,000              | 256,000 | 256,000 |
| Ingress per ASIC line module  | 256,000 | 256,000              | 256,000 | 256,000 |
| <b>Software lookup blocks</b>   |         |                      |         |         |
| Per ASIC line module  | 16,383  | 16,383               | 16,383  | 16,383  |
| <b>Secure policies (for packet mirroring)</b>   |         |                      |         |         |
| Per ASIC line module  | 1022    | 1022                 | 1022    | 1022    |
| Per chassis   | 2400    | 2400                 | 2400    | 2400    |

## Tunneling Maximums

Table 6 lists tunneling maximums for the ERX routers. The following notes are referred to in Table 6:

1. The SM supports any combination of DVMRP, GRE, and L2TP tunnels up to a maximum of 8000 tunnels; however, no more than 4000 tunnels can be DVMRP or GRE tunnels in any combination. The ISM supports any combination of DVMRP, GRE, and L2TP tunnels over IPSec, up to a maximum of 5000 tunnels; however, no more than 4000 tunnels can be DVMRP or GRE tunnels.
2. You can have no more than 8000 L2TP/IPSec sessions per chassis.
3. For more information about supported L2TP sessions and tunnels, see *JunosE Broadband Access Configuration Guide, Chapter 11, L2TP Overview*.

**Table 6: Tunneling Maximums**

| Feature   | ERX310 | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|--------|----------------------|---------|---------|
| <b>DVMRP (IP-in-IP) tunnels per chassis</b>                                 | 4000   | 4000                 | 4000    | 4000    |
| <b>DVMRP (IP-in-IP) tunnels per line module</b><br>(See Note 1 on page 78.) |        |                      |         |         |
| GE-2 with shared tunnel-server ports provisioned                            | 4000   | –                    | –       | 4000    |
| GE-HDE with shared tunnel-server ports provisioned                          | 4000   | –                    | –       | 4000    |
| IPSec Service Module (DVMRP/IPSec tunnels)                                  | 4000   | 4000                 | 4000    | 4000    |
| Service Module (SM)   | 4000   | 4000                 | 4000    | 4000    |
| <b>GRE tunnels per chassis</b>  | 4000   | 4000                 | 4000    | 4000    |
| <b>GRE tunnels per line module</b><br>(See Note 1 on page 78.)              |        |                      |         |         |
| GE-2 with shared tunnel-server ports provisioned                            | 4000   | –                    | –       | 4000    |
| GE-HDE with shared tunnel-server ports provisioned                          | 4000   | –                    | –       | 4000    |
| IPSec Service Module (GRE/IPSec tunnels)                                    | 4000   | 4000                 | 4000    | 4000    |
| Service Module (SM)   | 4000   | 4000                 | 4000    | 4000    |
| <b>IPSec manual secure tunnels per chassis</b>                              | 256    | 256                  | 256     | 256     |
| <b>IPSec transform sets per chassis</b>                                     | 1000   | 1000                 | 1000    | 1000    |
| <b>IPSec transforms per transform set</b>                                   | 6      | 6                    | 6       | 6       |
| <b>IPSec tunnels per chassis</b>  | 10,000 | 10,000               | 10,000  | 20,000  |
| <b>IPSec tunnels per IPSec Service Module</b>                               | 5000   | 5000                 | 5000    | 5000    |

**Table 6: Tunneling Maximums Table continued**

| Feature   | ERX310 | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|--------|----------------------|---------|---------|
| <b>L2TP sessions per chassis</b><br>(See Notes 2 and 3 on page 78.)     | 16,000 | 16,000               | 16,000  | 32,000  |
| <b>L2TP sessions per line module</b><br>(See Notes 1 and 3 on page 78.) |        |                      |         |         |
| GE-2 with shared tunnel-server ports provisioned                        | 8000   | –                    | –       | 8000    |
| GE-HDE with shared tunnel-server ports provisioned                      | 8000   | –                    | –       | 8000    |
| IPSec Service Module (ISM; L2TP/IPSec sessions)                         | 5000   | 5000                 | 5000    | 5000    |
| Service Module (SM)   | 16,000 | 16,000               | 16,000  | 16,000  |
| <b>L2TP tunnels per chassis</b>   | 8000   | 8000                 | 8000    | 8000    |
| <b>L2TP tunnels per line module</b><br>(See Notes 1 and 3 on page 78.)  |        |                      |         |         |
| GE-2 with shared tunnel-server ports provisioned                        | 8000   | –                    | –       | 8000    |
| GE-HDE with shared tunnel-server ports provisioned                      | 8000   | –                    | –       | 8000    |
| IPSec Service Module (L2TP/IPSec tunnels)                               | 5000   | 5000                 | 5000    | 5000    |
| Service Module  | 8000   | 8000                 | 8000    | 8000    |

## Subscriber Management Maximums

Table 7 lists subscriber management maximums for the ERX routers. The following notes are referred to in Table 7:

1. DHCP relay proxy maintains a list of active DHCP clients up to a maximum of 100,000 clients per chassis for all virtual routers. DHCP relay does not maintain a list of DHCP clients.

DHCP relay proxy is notified of DHCP client deletions and subsequently deletes the client's host routes. In contrast, DHCP relay is not notified of DHCP client deletions, so the host routes for deleted clients remain in DHCP relay until you permanently delete them with the **set dhcp relay discard-access-routes** command. A maximum of 100,000 host routes for DHCP clients can be stored for all DHCP relay and DHCP relay proxy instances (that is, for all virtual routers).

2. The ERX1440 router supports a maximum of 48,000 interface columns of all types combined. You can use either all dynamic interfaces or a combination of dynamic and static interfaces to achieve this maximum. For bridged Ethernet, IP network, and PPP interfaces, the ERX1440 router supports a maximum of 32,000 static major interfaces. Although the ERX1440 router supports a maximum of 48,000 static major interfaces for PPPoE, the PPPoE static limit is enforced at the subinterface level, which has a limit of 32,000.

The ERX705, ERX710, and ERX1410 routers support a maximum of 32,000 interfaces of all types combined; the ERX310 router supports a maximum of 16,000 interfaces of all types combined. For these routers, the interfaces can be any combination of dynamic or static.

The JunosE Software supports up to 10,000 PPP interfaces with EAP authentication negotiation configured. Performance and scalability is unchanged when EAP is not configured.

3. For DHCPv6 local server, up to 32,000 subscribers and clients are supported on PPP/ATM and PPPoE/ATM with dynamic interfaces. Interface flapping tests have been qualified for 8000 subscribers and interfaces.

**Table 7: Subscriber Management Maximums**

| Feature   | ERX310  | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|---|---------|----------------------|---------|---------|
| <b>DHCP external server clients (per chassis for all virtual routers; and per virtual router)</b><br>(See Note 1 on page 80.) | 100,000 | 100,000              | 100,000 | 100,000 |
| <b>DHCP local server</b><br>(See Note 2 on page 80.)  |         |                      |         |         |
| Client bindings per chassis   | 96,000  | 96,000               | 96,000  | 96,000  |
| Client interfaces per chassis   | 16,000  | 32,000               | 32,000  | 48,000  |
| Local address pools per virtual router  | 4000    | 4000                 | 4000    | 4000    |
| IP addresses per local address pool   | 32,000  | 32,000               | 32,000  | 32,000  |

**Table 7: Subscriber Management Maximums Table continued**

| Feature  | ERX310  | ERX705 and<br>ERX710 | ERX1410 | ERX1440 |
|--|---------|----------------------|---------|---------|
| <b>DHCPv6 local server</b>   |         |                      |         |         |
| Clients<br>(See Note 3 on page 80.)  | 32,000  | 32,000               | 32,000  | 32,000  |
| <b>DHCP relay and relay proxy client</b><br>(See Notes 1 and 2 on page 80.)  |         |                      |         |         |
| DHCP client host routes for DHCP relay and DHCP relay proxy combined (per chassis for all virtual routers; and per virtual router) | 100,000 | 100,000              | 100,000 | 100,000 |
| DHCP relay proxy clients (per chassis for all virtual routers; and per virtual router)   | 100,000 | 100,000              | 100,000 | 100,000 |
| Interfaces (per chassis for all virtual routers; and per virtual router)   | 16,000  | 32,000               | 32,000  | 48,000  |
| <b>Local authentication server</b>   |         |                      |         |         |
| Local user databases per chassis   | 100     | 100                  | 100     | 100     |
| Users per local user database  | 100     | 100                  | 100     | 100     |
| Users for all local user databases   | 100     | 100                  | 100     | 100     |
| <b>RADIUS requests</b>   |         |                      |         |         |
| Concurrent RADIUS authentication requests  | 4000    | 4000                 | 4000    | 32,000  |
| Concurrent RADIUS accounting requests  | 4000    | 4000                 | 4000    | 96,000  |
| <b>RADIUS route-download server downloaded routes per chassis</b>  | 32,000  | 32,000               | 32,000  | 32,000  |
| <b>Service Manager</b>   |         |                      |         |         |
| Service definitions  | 2048    | 2048                 | 2048    | 2048    |
| Service sessions (active)  | 131,072 | 131,072              | 131,072 | 131,072 |
| Active subscriber sessions   | 16,000  | 32,000               | 32,000  | 48,000  |
| <b>SRC Software and SDX Software</b>   |         |                      |         |         |
| COPS client instances  | 200     | 200                  | 200     | 200     |
| SRC clients  | 200     | 200                  | 200     | 200     |
| SRC interfaces   | 16,000  | 32,000               | 32,000  | 48,000  |
| <b>Subscriber interfaces</b><br>(See Note 2 on page 80.)   |         |                      |         |         |
| Dynamic subscriber interfaces per chassis  | 16,000  | 32,000               | 32,000  | 48,000  |
| Dynamic subscriber interfaces per line module  | 8000    | 8000                 | 8000    | 8000    |
| Static subscriber interfaces per chassis   | 16,000  | 32,000               | 32,000  | 48,000  |
| Static subscriber interfaces per line module   | 8000    | 8000                 | 8000    | 8000    |

## E120 and E320 System Maximums

The following tables provide system maximums for the E120 router and the E320 router.

### General System Maximums

Table 8 lists some general system maximums for the E120 router and the E320 router. The following notes are referred to in Table 8:

1. The maximum number applies to any combination of VRs and VRFs. The number of VRs and VRFs that you can configure depends on your configuration. You cannot achieve the maximum number if each VR and VRF instance is running a routing protocol.
2. The maximum of 3000 VRs and VRFs can be achieved only with the SRP-120 and SRP-320 modules, which have 4 GB of memory. The limits cannot be achieved with the SRP-100 module, which has 2 GB of memory.

**Table 8: General System Maximums**

| Feature   | E120     | E320              |
|---|----------|-------------------|
| Fabric size   | 120 Gbps | 100 Gbps/320 Gbps |
| Chassis per 7-foot rack   | 6        | 3                 |
| NTP clients   | 1000     | 1000              |
| NTP servers   | 300      | 300               |
| Sessions per chassis (simultaneous Telnet + FTP + SSH, in any combination)            | 30       | 30                |
| Virtual routers and VRFs per chassis, combined<br>(See Notes 1 and 2 on page 82.)     | 3000     | 3000              |
| Virtual routers and VRFs per line module, combined<br>(See Notes 1 and 2 on page 82.) | 3000     | 3000              |
| ICR Partitions per chassis  | 640      | 640               |
| ICR Partitions per line module  | 64       | 64                |

## Physical and Logical Density Maximums

Table 9 lists physical and logical density maximums for the E120 router and the E320 router. The following notes are referred to in Table 9:

1. Wire rate indicates the port density that supports maximum (wire-rate) performance. Oversubscribed indicates the port density possible if you are willing to accept less than wire-rate performance by oversubscribing the available fabric bandwidth.
2. With a 120 Gbps configuration on the E120 router, you can install up to 6 combinations of ES2 10G Uplink LMs, ES2 10G LMs, or ES2 10G ADV LMs in slots numbered 0-5. You can install a maximum of 6 active ports and 6 redundant ports at any time.

With a 100 Gbps fabric configuration on the E320 router, you must install the ES2 10G Uplink LM or the ES2 10G LM in either of the E320 router turbo slots (2 and 4). When the ES2 10G Uplink LM or the ES2 10G LM is installed in slot 2 or slot 4, you cannot install another line module in slot 3 or slot 5. In this case, you can only install the ES2 4G LM in slots 0-1 and 6-11; therefore, the maximum number of ports and the forwarding performance per chassis is reduced for the IOAs that pair with the ES2 4G LM.

With a 320 Gbps fabric configuration on the E320 router, you can install up to 12 combinations of ES2 10G Uplink LMs, ES2 10G LMs, or ES2 10G ADV LMs in slots numbered 0-5 and 11-16. You can install a maximum of 12 active ports and 12 redundant ports at any time.

**Table 9: Physical and Logical Density Maximums**

| Feature   | E120  | E320    |
|---|-------|---------|
| <b>Physical density wire rate/oversubscribed</b>                  |       |         |
| (See Note 1 on page 83.)  |       |         |
| 10-Gigabit Ethernet ports per chassis<br>(ES2-S1 10GE IOA)        | 6     | 12      |
| 10-Gigabit Ethernet ports per chassis<br>(ES2-S2 10GE PR IOA)     | 6 + 6 | 12 + 12 |
| (See Note 2 on page 83.)  |       |         |
| Gigabit Ethernet ports per chassis<br>(ES2-S1 GE-4 IOAs)          | 24    | 48      |
| Gigabit Ethernet ports per chassis<br>(ES2-S1 GE-8 IOAs)          | 96    | 192     |
| (See Note 2 on page 83.)  |       |         |
| Gigabit Ethernet ports per chassis<br>(ES2-S3 GE-20 IOA)          | 120   | 240     |
| (See Note 2 on page 83.)  |       |         |
| OC3/STM-1 ATM ports per chassis<br>(ES2-S1 OC3-8 STM1 ATM IOAs)   | 96    | 192     |
| OC12/STM-4 ATM ports per chassis<br>(ES2-S1 OC12-2 STM4 ATM IOAs) | 24    | 48      |
| OC12/STM-4 POS ports per chassis<br>(ES2-S1 OC12-2 STM4 POS IOAs) | 24    | 48      |
| OC48/STM16 ports per chassis<br>(ES2-S1 OC48 STM16 POS IOAs)      | 6     | 12      |

**Table 9: Physical and Logical Density Maximums Table continued**

| Feature                            | E120 | E320 |
|------------------------------------|------|------|
| <b>Logical density per chassis</b> |      |      |
| Logical OC3/STM1 per chassis       | 96   | 192  |
| Logical OC12/STM4 per chassis      | 24   | 48   |
| Logical OC48/STM16 per chassis     | 6    | 12   |

## Link Layer Maximums

Table 10 lists link layer maximums for the E120 router and the E320 router. The following notes are referred to in Table 10:

1. On the ES2 10G LM, ES2 10G ADV LM, or ES2 10 G Uplink LM, you can have configurations with up to 100,000 static entries that support 100,000 DHCP relay proxy clients. You can have an additional 28,000 static or dynamic entries for network resources, such as RADIUS and DHCP servers. However, the total number of dynamic entries in the ARP table is still restricted to a maximum of 32,768 per line module.
2. On the E120 router, the SRP-120 and the SRP-320 support a maximum of 64,000 interfaces.  
On the E320 router, the SRP-320 supports a maximum of 96,000 interfaces. The SRP-100 supports a maximum of 64,000 interfaces.
3. The E120 router supports a maximum of 64,000 interface columns of all types combined. The E320 router supports a maximum of 96,000 interface columns of all types combined. You can use all dynamic interfaces, or all static interfaces, or a combination of dynamic and static interfaces to achieve this maximum.  
The JunosE Software supports up to 10,000 PPP interfaces with EAP authentication negotiation configured. Performance and scalability is unchanged when EAP is not configured.
4. The E120 router supports a maximum of 64,000 Ethernet subinterfaces that can be active at any one time. The E320 router supports a maximum of 96,000 Ethernet subinterfaces that can be active at any one time. Of this total, you can configure all single-tagged VLAN subinterfaces, all double-tagged S-VLAN subinterfaces, or a combination of both VLAN subinterfaces and S-VLAN subinterfaces to achieve this maximum.
5. The E120 router and the E320 router support 16,384 VLAN subinterfaces per slot on the ES2 4G LM and the ES2 10G LM, and 32,768 VLAN subinterfaces per slot on the ES2 10G ADV LM. On the E120 router, a maximum of 64,000 VLAN subinterfaces is supported per chassis. On the E320 router, a maximum of 96,000 VLAN subinterfaces is supported per chassis. You can use all dynamic interfaces, or all static interfaces, or a combination of dynamic and static interfaces to achieve this maximum.
6. For all LMs, no more than 16,384 S-VLANs are supported per port. The ES2 10G ADV LM supports 32,768 S-VLANs per module. All other LMs support only 16,384 S-VLANs per module.
7. For all LMs, no more than 4096 VLANs are supported per port. The ES2 10G ADV LM supports 32,768 VLANs per module. All other LMs support only 16,384 VLANs per module.
8. No more than 8192 VLAN major interfaces are supported per line module.

**Table 10: Link Layer Maximums**

| Feature                            | E120   | E320   |
|------------------------------------|--------|--------|
| <b>ARP entries per line module</b> |        |        |
| Dynamic entries per LM             | 32,768 | 32,768 |
| Static entries per ES2 4G LM       | 32,768 | 32,768 |

**Table 10: Link Layer Maximums Table continued**

| Feature   | E120    | E320    |
|---|---------|---------|
| Static entries per ES2 10G LM, ES2 10G ADV LM, or ES2 10G Uplink LM<br>(See Note 1 on page 85.) | 128,000 | 128,000 |
| Total entries per ES2 4G LM   | 32,768  | 32,768  |
| Total entries per ES2 10G LM, ES2 10G ADV LM, or ES2 10G Uplink LM<br>(See Note 1 on page 85.)  | 128,000 | 128,000 |
| <b>ATM bulk configuration VC ranges per chassis</b>   | 300     | 1025    |
| <b>ATM bulk configuration VC ranges per line module</b>   | 300     | 1025    |
| <b>ATM bulk configuration total VCs per chassis</b>   | 192,000 | 384,000 |
| <b>ATM bulk configuration total VCs per line module</b>   |         |         |
| ES2 4G LM and OCx/STMx ATM IOA  | 32,000  | 32,000  |
| <b>ATM bulk configuration overriding profile assignments per chassis</b>                        | 100     | 100     |
| <b>ATM VCs per chassis</b><br>(See Note 2 on page 85.)  | 64,000  | 96,000  |
| <b>ATM VCs per line module</b>  |         |         |
| ES2 4G LM and OCx/STMx ATM IOA  | 16,000  | 16,000  |
| <b>ATM VCs per port</b>   |         |         |
| ES2 4G LM and OCx/STMx ATM IOA  | 16,000  | 16,000  |
| <b>ATM VC classes per chassis</b>   | 100     | 100     |
| <b>ATM VP/VC addresses per line module</b>  |         |         |
| ES2 4G LM and OCx/STMx ATM IOA  | 24-bit  | 24-bit  |
| <b>ATM VP tunnels per port, all supported modules</b>   | 256     | 256     |
| <b>Bridged Ethernet interfaces per chassis</b><br>(See Notes 2 and 3 on page 85.)               | 64,000  | 96,000  |
| <b>Bridged Ethernet interfaces per line module (OCx/STMx ATM)</b>                               | 16,000  | 16,000  |

**Table 10: Link Layer Maximums Table continued**

| Feature   | E120   | E320   |
|---|--------|--------|
| <b>Dynamic interfaces</b>   |        |        |
| Active autosensed dynamic interface columns per chassis over static or dynamic (bulk) ATM1483 subinterfaces<br>(See Note 2 on page 85.) | 64,000 | 96,000 |
| <b>Ethernet 802.3ad Link Aggregation</b>  |        |        |
| Links per LAG (bundle)  | 8      | 8      |
| LAGs (bundles) per chassis  | 64     | 64     |
| <b>Ethernet S-VLANs per chassis</b>   |        |        |
| (See Notes 2, 4, and 5 on page 85.)   | 64,000 | 96,000 |
| <b>Ethernet S-VLANs per IOA</b>   |        |        |
| (See Note 6 on page 85.)  |        |        |
| ES2-S1 GE-4 IOA<br>(with ES2 4G LM)   | 16,384 | 16,384 |
| ES2-S1 GE-8 IOA<br>(with ES2 4G LM or ES2 10G LM)   | 16,384 | 16,384 |
| ES2-S1 GE-8 IOA<br>(with ES2 10G ADV LM)  | 32,768 | 32,768 |
| ES2-S1 10GE IOA<br>(with ES2 4G LM)   | 16,384 | 16,384 |
| ES2-S2 10GE PR IOA<br>(with ES2 10G LM or ES2 10G Uplink LM)  | 16,384 | 16,384 |
| ES2-S2 10GE PR IOA<br>(with ES2 10G ADV LM)   | 32,768 | 32,768 |
| ES2-S3 GE-20 IOA<br>(with ES2 10G LM)   | 16,384 | 16,384 |
| ES2-S3 GE-20 IOA<br>(with ES2 10G ADV LM)   | 32,768 | 32,768 |
| <b>Ethernet VLANs per chassis</b>   |        |        |
| (See Notes 2, 4, and 5 on page 85.)   | 64,000 | 96,000 |
| <b>Ethernet VLANs per IOA</b>   |        |        |
| (See Note 7 on page 85.)  |        |        |
| ES2-S1 GE-4 IOA<br>(with ES2 4G LM)<br>(See Note 5 on page 85.)   | 16,384 | 16,384 |
| ES2-S1 GE-8 IOA<br>(with ES2 4G LM or ES2 10G LM)<br>(See Note 5 on page 85.)   | 16,384 | 16,384 |
| ES2-S1 GE-8 IOA<br>(with ES2 10G ADV LM)<br>(See Note 5 on page 85.)  | 32,768 | 32,768 |

**Table 10: Link Layer Maximums Table continued**

| Feature   | E120   | E320   |
|---|--|--------|
| ES2-S1 10GE IOA<br>(with ES2 4G LM)<br>(See Note 5 on page 85.)   | 16,384   | 16,384 |
| ES2-S2 10GE PR IOA<br>(with ES2 10G LM, ES2 10G ADV LM, or ES2 10G Uplink LM)<br>(See Note 5 on page 85.)   | 4096   | 4096   |
| ES2-S3 GE-20 IOA<br>(with ES2 10G LM)   | 16,384   | 16,384 |
| ES2-S3 GE-20 IOA<br>(with ES2 10G ADV LM)   | 32,768   | 32,768 |
| <b>Ethernet VLAN major interfaces over Bridged Ethernet Interfaces, per IOA</b><br>(See Note 8 on page 85.) |  |        |
| ES2-S1 GE-4 IOA<br>(with ES2 4G LM)   | 8192   | 8192   |
| ES2-S1 GE-8 IOA<br>(with ES2 4G LM, ES2 10G LM, or ES2 10G ADV LM)  | 8192   | 8192   |
| ES2-S1 10GE IOA<br>(with ES2 4G LM)   | 8192   | 8192   |
| ES2-S2 10GE PR IOA (with ES2 10G LM, ES2 10G ADV LM, or ES2 10G Uplink LM)                                  | 4096   | 4096   |
| ES2-S3 GE-20 IOA<br>(with ES2 10G LM or ES2 10G ADV LM)   | 8192   | 8192   |
| <b>Ethernet VLAN bulk configuration VLAN ranges per chassis</b>   | 1000   | 1000   |
| <b>Ethernet VLAN bulk configuration VLAN ranges per line module</b>   | 500  | 500    |
| <b>Ethernet VLAN overriding profile assignments per chassis</b>   | 200  | 200    |
| <b>Ethernet VRRP VRIDs per line module</b>  | 800  | 800    |
| <b>HDLC interfaces per chassis</b>  | 24,000   | 24,000 |
| <b>HDLC interfaces per line module</b>  | 8000   | 8000   |
| <b>MLPPP bundles per chassis</b>  | 12,000   | 12,000 |
| <b>MLPPP bundles per line module</b>  | The maximum number of MLPPP bundles supported per line module is the lesser of the maximum number of MLPPP bundles supported per chassis or of the maximum number of interfaces supported on the line module. For more information, see the <i>JunosE Link Layer Configuration Guide</i> . |        |

**Table 10: Link Layer Maximums Table continued**

| Feature  | E120   | E320   |
|--|--------|--------|
| <b>PPP major interfaces per chassis</b>  | 64,000 | 96,000 |
| (See Notes 2 and 3 on page 85.)  |        |        |
| <b>PPP major interfaces per line module (ignoring physical interface constraints)</b>      |        |        |
| ES2 4G LM  | 16,000 | 16,000 |
| ES2 10G LM   | 16,000 | 16,000 |
| ES2 10G ADV LM   | 32,000 | 32,000 |
| <b>PPP subinterfaces per chassis</b>   | 64,000 | 96,000 |
| (See Notes 2 and 3 on page 85.)  |        |        |
| <b>PPP subinterfaces per line module (ignoring physical interface constraints)</b>         |        |        |
| ES2 4G LM  | 16,000 | 16,000 |
| ES2 10G LM   | 16,000 | 16,000 |
| ES2 10G ADV LM   | 32,000 | 32,000 |
| <b>PPP packet logging</b>  |        |        |
| Aggregate dynamic and static PPP interfaces for which you can log PPP packets per chassis  | 32     | 32     |
| <b>PPPoE service name tables</b>   |        |        |
| PPPoE service name tables per chassis  | 16     | 16     |
| Service name tags per PPPoE service name table (including one empty service name tag)      | 17     | 17     |
| <b>PPPoE subinterfaces per chassis</b>   | 64,000 | 96,000 |
| (See Notes 2 and 3 on page 85.)  |        |        |
| <b>PPPoE subinterfaces per line module</b>   |        |        |
| ES2 4G LM  | 16,000 | 16,000 |
| ES2 10G LM   | 16,000 | 16,000 |
| ES2 10G ADV LM   | 32,000 | 32,000 |
| <b>Transparent bridging and VPLS</b>   |        |        |
| Bridge groups or VPLS instances per chassis  | 1024   | 1024   |
| Bridge interfaces per line module in bridge groups or VPLS instances                       | 8000   | 8000   |
| Bridge interfaces per chassis in bridge groups or VPLS instances                           | 32,000 | 32,000 |
| Learned MAC address entries combined for all bridge groups and VPLS instances on a chassis | 64,000 | 64,000 |

## Routing Protocol Maximums

Table 11 lists routing protocol maximums for the E120 router and the E320 router. The following notes are referred to in Table 11:

1. The total set of FTEs can be shared by interfaces, next hops, ECMP sets, VRs, and VRFs. Next-hop FTEs identify the next hop on multiaccess media, such as ATM multipoint, Ethernet, or bridged Ethernet. Each VR or VRF consumes three entries. Each interface, next hop, and ECMP set consumes a single entry. One FTE is reserved for internal use, and the system software limits the number of FTEs used by interfaces to a maximum of 32,000. The remaining FTEs can be shared across the other types.
2. On the E120 router, the SRP-120 and the SRP-320 support a maximum of 64,000 IP network interfaces. On the E320 router, the SRP-320 supports a maximum of 96,000 IP network interfaces. The SRP-100 supports a maximum of 64,000 IP network interfaces.  
You can use either all dynamic interfaces or a combination of dynamic and static interfaces to achieve this maximum.
3. These values are subject to limitations on available SRP module memory, which varies according to your router configuration.
4. Depending on your configuration, the router may support more routing table entries or fewer routing table entries than this value. In any case, you can choose to limit the number of routes that can be added to the routing table on a per-VR or per-VRF basis by means of the **maximum routes** command.
5. The maximum number of ANCP adjacencies can be scaled over a maximum of 100 virtual routers. Fewer ANCP adjacencies can be scaled in configurations with more than 100 virtual routers.
6. On the E320 router, you can achieve 32,767 total Martini circuits only over Ethernet interfaces. For all routers, the total Martini circuits can be any combination of external inter-router circuits and internal circuits (local cross-connects).
7. There is no per-VR limit; all multicast routes can be on a single VR or present across multiple VRs.
8. The maximum number of interfaces can be achieved by any combination; for example, two streams each being replicated to 32,768 interfaces; 16,384 streams each being replicated four times; or any other combination.

**Table 11: Routing Protocol Maximums**

| Feature   | E120 | E320 |
|---|------|------|
| <b>BFD</b>  |      |      |
| Sessions per line module for ES2 4G LM                        | 100  | 100  |
| Sessions per line module for all modules other than ES2 4G LM | 50   | 50   |
| <b>ECMP maximum paths to a destination</b>                    |      |      |
| BGP, IS-IS, MPLS, OSPF, RIP                                   | 16   | 16   |

**Table 11: Routing Protocol Maximums Table continued**

| Feature   | E120      | E320      |
|---|-----------|-----------|
| <b>IPv4 forwarding table entries per chassis</b><br>(See Note 1 on page 90.)                              | 1,048,576 | 1,048,576 |
| <b>IP network interfaces (IPv4 and IPv6)</b>  |           |           |
| Per chassis<br>(See Note 2 on page 90.)   | 64,000    | 96,000    |
| Per ES2 4G LM   | 16,000    | 16,000    |
| Per ES2 10G LM  | 16,000    | 16,000    |
| Per ES2 10G ADV LM  | 32,000    | 32,000    |
| Per ES2 10G Uplink LM   | 8000      | 8000      |
| <b>IPv4 routing protocol scaling and peering densities</b><br>(See Note 3 on page 90.)                    |           |           |
| Routing table entries<br>(See Note 4 on page 90.)   | 500,000   | 500,000   |
| ANCP Adjacency Scaling<br>(See Note 5 on page 90.)  | 5000      | 5000      |
| BGP-4 peering sessions  | 3000      | 3000      |
| BGP-4 routes (NLRI)   | 1,500,000 | 1,500,000 |
| IP next hops (egress FECs); used to represent the IP addresses of next-hop routers on Ethernet interfaces | 1,000,000 | 1,000,000 |
| MPLS next hops (egress FECs) when graceful restart is not enabled   | 500,000   | 500,000   |
| MPLS next hops (egress FECs) when graceful restart is enabled   | 250,000   | 250,000   |
| MPLS forwarding entries when graceful restart is not enabled  | 64,000    | 64,000    |
| MPLS forwarding entries when graceful restart is enabled  | 32,000    | 32,000    |
| IS-IS adjacencies   | 150       | 150       |
| IS-IS routes  | 20,000    | 20,000    |
| MPLS LDP LSPs when graceful restart is not enabled  | 10,000    | 10,000    |
| MPLS LDP LSPs when graceful restart is enabled  | 5000      | 5000      |
| MPLS RSVP-TE LSPs when graceful restart is not enabled  | 10,000    | 10,000    |
| MPLS RSVP-TE LSPs when graceful restart is enabled  | 5000      | 5000      |
| OSPF adjacencies  | 1000      | 1000      |
| OSPF routes   | 25,000    | 25,000    |
| <b>IPv6 routing table entries</b><br>(See Note 3 on page 90.)   | 100,000   | 100,000   |
| <b>J-Flow statistics</b>  |           |           |
| J-Flow-enabled VRs and VRFs, in any combination   | 16        | 16        |
| Sampled interfaces per VR or VRF  | 32        | 32        |
| Total sampled Interfaces per chassis  | 512       | 512       |

**Table 11: Routing Protocol Maximums Table continued**

| Feature   | E120   | E320   |
|---|--|--|
| <b>Martini circuits for layer 2 services over MPLS</b>                              |  |  |
| Total Martini circuits per line module  | 16,000   | 16,000   |
| Total Martini circuits per chassis<br>(See Note 6 on page 90.)                      | 16,000   | 32,767   |
| External Martini circuits per chassis   | 16,000   | 32,767   |
| Internal Martini circuits (local cross-connects) per chassis                        | 16,000   | 32,767   |
| <b>Mobile IP bindings per chassis</b>   |  |  |
|   | –  | 96,000   |
| <b>Multicast routes (IPv4 and IPv6)</b>   |  |  |
| Forwarding entries [(S,G) pairs] per chassis<br>(See Note 7 on page 90.)            | 16,384   | 16,384   |
| Outgoing interfaces per chassis<br>(See Note 8 on page 90.)                         | 65,536   | 65,536   |
| <b>Response Time Reporter simultaneous operations per VR</b>                        |  |  |
|   | 500  | 500  |
| <b>Response Time Reporter maximum tests per chassis (SRP-100 or SRP-320)</b>        |  |  |
|   | –  | 500  |
| <b>Response Time Reporter maximum tests per virtual router (SRP-100 or SRP-320)</b> |  |  |
|   | –  | 100  |
| <b>VRRP VRIDs per line module</b>   |  |  |
|   | See <i>Ethernet VRRP VRIDs per line module</i> on page 88. | See <i>Ethernet VRRP VRIDs per line module</i> on page 88. |

## Policy and QoS Maximums

Table 12 lists policy and QoS maximums for the E120 router and the E320 router. The following notes are referred to in Table 12:

1. For more information about system resource requirements for nodes, queues, and shadow nodes, see *JunosE Quality of Service Configuration Guide, Chapter 15, QoS Profile Overview*. QoS is supported on all E Series line modules except for the ES2 10G Uplink LM.
2. For all line modules the maximum number of IPv4 or IPv6 or VLAN policy attachments is determined by the maximum number of interfaces multiplied by the number of attachment resources that are currently used. Attachment resources are only used when you attach the policy.

The line modules support policy attachments based on the following considerations:

- IPv4—Up to 2 ingress policy attachments and 1 egress policy attachment
  - Secure policy—Up to 1 ingress policy attachment and 1 egress policy attachment (ES2 10G LM and ES2 10G ADV LM only)
  - IPv6—Up to 2 ingress policy attachments and 1 egress policy attachment
  - IPv4 secure policy—The ES2 4G LM, the ES2 10G LM, and the ES2 10G ADV LM support up to 1 ingress policy attachment and 1 egress policy attachment
  - IPv6 secure policy—The ES2 4G LM supports up to 1 ingress policy attachment and 1 egress policy attachment
  - VLANs—Up to 1 ingress policy attachment and 1 egress policy attachment
3. Secure policies are not supported on the ES2 10G Uplink LM. IPv6 secure policies are not supported on the ES2 10G LM.

**Table 12: Policy and QoS Maximums**

| Feature  | E120    | E320    |
|--|---------|---------|
| QoS queues per line module<br>(See Note 1 on page 93.) | 128,000 | 128,000 |
| QoS profiles configurable per chassis                  | 1000    | 1000    |
| QoS profile attachments per chassis                    | 96,000  | 96,000  |
| QoS profile attachments per line module                |         |         |
| ES2 4G LM  | 16,000  | 16,000  |
| ES2 10G LM   | 16,000  | 16,000  |
| ES2 10G ADV LM   | 32,000  | 32,000  |
| QoS scheduler nodes per line module                    | 64,000  | 64,000  |
| QoS shapers per line module                            | 64,000  | 64,000  |

**Table 12: Policy and QoS Maximums Table continued**

| Feature   | E120    | E320    |
|---|---------|---------|
| Classification rules per policy   | 512     | 512     |
| <b>Policy classification (CLACL) entries per line module</b>                          |         |         |
| ES2 4G LM   | 256,000 | 256,000 |
| ES2 10G LM  | 262,143 | 262,143 |
| ES2 10G ADV LM  | 131,071 | 131,071 |
| ES2 10G Uplink LM   | 131,071 | 131,071 |
| <b>Policy egress interface attachments per line module</b>                            |         |         |
| (See Note 2 on page 93.)  |         |         |
| ES2 4G LM<br>combined IP and IPv6 interface attachments                               | 16,383  | 16,383  |
| ES2 4G LM<br>combined ATM, GRE, L2TP (LAC only), MPLS, and VLAN interface attachments | 16,383  | 16,383  |
| ES2 10G LM<br>combined IP and IPv6 interface attachments                              | 16,383  | 16,383  |
| ES2 10G LM<br>VLAN interface attachments  | 16,383  | 16,383  |
| ES2 10G ADV LM<br>IP interface attachments  | 32,000  | 32,000  |
| ES2 10G ADV LM<br>VLAN interface attachments  | 32,000  | 32,000  |
| ES2 10G Uplink LM<br>combined IP and IPv6 interface attachments                       | 16,383  | 16,383  |
| ES2 10G Uplink LM<br>VLAN interface attachments                                       | 8191    | 8191    |
| <b>Policy ingress interface attachments per line module</b>                           |         |         |
| (See Note 2 on page 93.)  |         |         |
| ES2 4G LM<br>combined IP and IPv6 interface attachments                               | 32,767  | 32,767  |
| ES2 4G LM<br>combined ATM, GRE, L2TP (LAC only), MPLS, and VLAN interface attachments | 16,383  | 16,383  |
| ES2 10G LM<br>IP interface attachments  | 16,383  | 16,383  |
| ES2 10G LM<br>VLAN interface attachments  | 16,383  | 16,383  |
| ES2 10G ADV LM<br>IP interface attachments  | 64,000  | 64,000  |
| ES2 10G ADV LM<br>VLAN interface attachments  | 32,000  | 32,000  |

**Table 12: Policy and QoS Maximums Table continued**

| Feature   | E120    | E320    |
|---|---------|---------|
| ES2 10G Uplink LM<br>IP interface attachments             | 16,383  | 16,383  |
| ES2 10G Uplink LM<br>VLAN interface attachments           | 8191    | 8191    |
| <b>Rate limiters (egress) per line module</b>             |         |         |
| ES2 4G LM   | 64,000  | 64,000  |
| ES2 10G LM  | 64,000  | 64,000  |
| ES2 10G ADV LM  | 64,000  | 64,000  |
| ES2 10G Uplink LM   | 64,000  | 64,000  |
| <b>Rate limiters (ingress) per line module</b>            |         |         |
| ES2 4G LM   | 64,000  | 64,000  |
| ES2 10G LM  | 64,000  | 64,000  |
| ES2 10G ADV LM  | 64,000  | 64,000  |
| ES2 10G Uplink LM   | 64,000  | 64,000  |
| <b>Policy statistics blocks (egress) per line module</b>  |         |         |
| ES2 4G LM   | 256,000 | 256,000 |
| ES2 10G LM  | 256,000 | 256,000 |
| ES2 10G ADV LM  | 512,000 | 512,000 |
| ES2 10G Uplink LM   | 256,000 | 256,000 |
| <b>Policy statistics blocks (ingress) per line module</b> |         |         |
| ES2 4G LM   | 256,000 | 256,000 |
| ES2 10G LM  | 256,000 | 256,000 |
| ES2 10G ADV LM  | 512,000 | 512,000 |
| ES2 10G Uplink LM   | 256,000 | 256,000 |
| <b>Parent groups (egress) per line module</b>             |         |         |
| ES2 4G LM   | 49,151  | 49,151  |
| ES2 10G LM<br>(internal parent groups only)               | 8191    | 8191    |
| ES2 10G ADV LM<br>(internal parent groups only)           | 8191    | 8191    |
| ES2 10G Uplink LM<br>(internal parent groups only)        | 8191    | 8191    |
| <b>Parent groups (ingress) per line module</b>            |         |         |
| ES2 4G LM   | 49,151  | 49,151  |
| ES2 10G LM<br>(internal parent groups only)               | 8191    | 8191    |

**Table 12: Policy and QoS Maximums Table continued**

| Feature  | E120   | E320   |
|--|--------|--------|
| ES2 10G ADV LM<br>(internal parent groups only)    | 8191   | 8191   |
| ES2 10G Uplink LM<br>(internal parent groups only) | 8191   | 8191   |
| <b>Software lookup blocks per line module</b>      |        |        |
| ES2 4G LM  | 16,383 | 16,383 |
| ES2 10G LM   | 16,383 | 16,383 |
| ES2 10G ADV LM                                     | 32,000 | 32,000 |
| ES2 10G Uplink LM                                  | 16,383 | 16,383 |
| <b>Secure policies (for packet mirroring)</b>      |        |        |
| Per chassis  | 2400   | 2400   |
| Per line module<br>(See Note 3 on page 93.)        | 1022   | 1022   |

## Tunneling Maximums

Table 13 lists tunneling maximums for the E120 router and the E320 router. The following notes are referred to in Table 13:

1. The ES2-S1 Service IOA supports any combination of DVMRP, GRE, and L2TP tunnels up to a maximum of 8000 tunnels; however, no more than 4000 tunnels can be DVMRP or GRE tunnels in any combination.
2. For more information about supported L2TP sessions and tunnels, see *JunosE Broadband Access Configuration Guide, Chapter 11, L2TP Overview*.

**Table 13: Tunneling Maximums**

| Feature   | E120   | E320   |
|---|--------|--------|
| DVMRP (IP-in-IP) tunnels per chassis  | 4000   | 4000   |
| DVMRP (IP-in-IP) tunnels per line module with shared tunnel-server ports provisioned                  | 4000   | 4000   |
| DVMRP (IP-in-IP) tunnels per ES2-S1 Service IOA<br>(See Note 1 on page 97.)                           | 4000   | 4000   |
| GRE tunnels per chassis   | 4000   | 4000   |
| GRE tunnels per line module with shared tunnel-server ports provisioned                               | 4000   | 4000   |
| GRE tunnels per ES2-S1 Service IOA<br>(See Note 1 on page 97.)  | 4000   | 4000   |
| L2TP sessions per chassis<br>(See Note 2 on page 97.)   | 60,000 | 60,000 |
| L2TP sessions per line module with shared tunnel-server ports provisioned<br>(See Note 2 on page 97.) | 8000   | 8000   |
| L2TP sessions per ES2-S1 Service IOA<br>(See Note 2 on page 97.)                                      | 16,000 | 16,000 |
| L2TP tunnels per chassis for SRP-100  | 16,000 | 16,000 |
| L2TP tunnels per chassis for SRP-320 with ES2 4G LM   | 32,000 | 32,000 |

**Table 13: Tunneling Maximums Table continued**

| Feature   | E120   | E320   |
|---|--------|--------|
| <b>L2TP tunnels per line module with shared tunnel-server ports provisioned</b><br>(See Note 2 on page 97.) | 8000   | 8000   |
| <b>L2TP tunnels per ES2-S1 Service IOA</b><br>(See Note 1 and Note 2 on page 97.)                           | 16,000 | 16,000 |

## Subscriber Management Maximums

Table 14 lists subscriber management maximums for the E120 router and the E320 router. The following notes are referred to in Table 14:

1. DHCP relay proxy maintains a list of active DHCP clients up to a maximum of 100,000 clients per chassis for all virtual routers. DHCP relay does not maintain a list of DHCP clients.

DHCP relay proxy is notified of DHCP client deletions and subsequently deletes the client's host routes. In contrast, DHCP relay is not notified of DHCP client deletions, so the host routes for deleted clients remain in DHCP relay until you permanently delete them with the **set dhcp relay discard-access-routes command**. A maximum of 100,000 host routes for DHCP clients can be stored for all DHCP relay and DHCP relay proxy instances (that is, for all virtual routers).

2. On the E120 router, the SRP-120 and the SRP-320 support a maximum of 64,000 interfaces.

On the E320 router, the SRP-320 supports a maximum of 96,000 interfaces. The SRP-100 supports a maximum of 64,000 interfaces.

3. For DHCPv6 local server, up to 32,000 subscribers and clients are supported on PPP/ATM and PPPoE/ATM with dynamic interfaces. Interface flapping tests have been qualified for 8000 subscribers and interfaces.

**Table 14: Subscriber Management Maximums**

| Feature  | E120    | E320    |
|--|---------|---------|
| <b>DHCP external server clients (per chassis for all virtual routers; and per virtual router)</b><br>(See Note 1 on page 99.)      | 100,000 | 100,000 |
| <b>DHCP local server</b><br>(See Note 2 on page 99.)   |         |         |
| Client bindings per chassis  | 96,000  | 96,000  |
| Client interfaces per chassis  | 64,000  | 96,000  |
| Local address pools per virtual router   | 4000    | 4000    |
| IP addresses per local address pool  | 96,000  | 96,000  |
| <b>DHCPv6 local server</b>   |         |         |
| Clients<br>(See Note 3 on page 99.)  | 32,000  | 32,000  |
| <b>DHCP relay and relay proxy client</b><br>(See Notes 1 and 2 on page 99.)  |         |         |
| DHCP client host routes for DHCP relay and DHCP relay proxy combined (per chassis for all virtual routers; and per virtual router) | 100,000 | 100,000 |
| DHCP relay proxy clients (per chassis for all virtual routers; and per virtual router)   | 100,000 | 100,000 |
| Interfaces (per chassis for all virtual routers; and per virtual router)   | 64,000  | 96,000  |

**Table 14: Subscriber Management Maximums Table continued**

| Feature   | E120   | E320   |
|---|--------|--------|
| <b>RADIUS requests</b>  |        |        |
| Concurrent RADIUS authentication requests                         | 32,000 | 32,000 |
| Concurrent RADIUS accounting requests                             | 32,000 | 96,000 |
| <b>RADIUS route-download server downloaded routes per chassis</b> |        |        |
|   | 64,000 | 96,000 |
| <b>Service Manager</b>  |        |        |
| Service definitions   | 2048   | 2048   |
| <b>SRC Software and SDX Software</b>                              |        |        |
| COPS client instances   | 200    | 200    |
| SRC clients   | 200    | 200    |
| SRC interfaces  | 48,000 | 96,000 |
| <b>Subscriber interfaces</b>                                      |        |        |
| (See Note 2 on page 99.)  |        |        |
| Dynamic subscriber interfaces per chassis                         | 64,000 | 96,000 |
| Dynamic subscriber interfaces per ES2 4G LM                       | 16,000 | 16,000 |
| Dynamic subscriber interfaces per ES2 10G LM                      | 16,000 | 16,000 |
| Dynamic subscriber interfaces per ES2 10G ADV LM                  | 32,000 | 32,000 |
| Static subscriber interfaces per chassis                          | 64,000 | 96,000 |
| Static subscriber interfaces per ES2 4G LM                        | 16,000 | 16,000 |
| Static subscriber interfaces per ES2 10G LM                       | 16,000 | 16,000 |
| Static subscriber interfaces per ES2 10G ADV LM                   | 32,000 | 32,000 |

# Applying a ToS Mark to Color-Coded Packets in Aggregate Rate-Limit Hierarchical Policies

The information provided in this appendix updates the *Example: Aggregate Marking with Oversubscription Rate-Limiting Hierarchical Policy* section in *Chapter 5, Creating Rate-Limit Profiles of the JunosE Policy Management Configuration Guide*.

## Example: Aggregate Marking with Oversubscription Rate-Limiting Hierarchical Policy

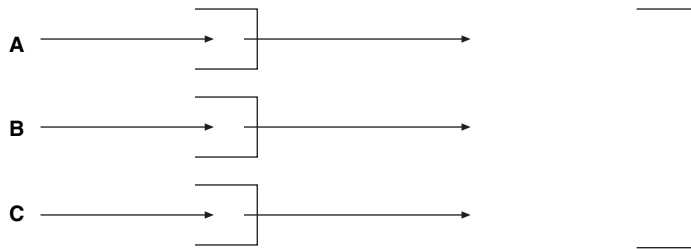
Figure 1 shows an aggregate rate limit that enables up to 2 Mbps of traffic to be sent with a ToS value marked as 10. Traffic above that rate is sent with a ToS value marked as 20 or 30 (depending on packet type) and traffic above 6 Mbps is dropped. The 2 Mbps of traffic with the ToS value of 10 is oversubscribed among individual flows A, B, and C, each of which can have up to 1 Mbps of traffic with the ToS value of 10. An individual flow can mark a packet with the ToS value of 10, but if there is insufficient bandwidth at the shared rate limit because of oversubscription, the packet is demoted and remarked.

The demoted packets from flow A are marked with the ToS value of 20 but the demoted packets from flows B and C are marked with the ToS value of 30. The shared rate limit determines whether to demote the packet, in which case each individual rate limit selects the new ToS marking. Individual flows are not required to mark demoted packets with the same value.

The committed and conformed actions are transmit conditional so that all packets also go through rate limit S, because rate limit S imposes the limit of 2 Mbps of traffic with the ToS value of 10 (total across A, B, and C).

Committed packets are transmitted conditionally to rate limit S, which has a peak rate of 6 Mbps and a committed rate of 2 Mbps; these packets can be demoted by S to Y (yellow), in which case they are remarked with the ToS value of 20 or 30. If S leaves them as G (green), they are marked with the ToS value of 10. All conformed packets from A, B, and C are also transmitted conditionally to S but arrive as Y because rate limits do not promote packets in color. S is color-aware so these Y packets do not take away G tokens, leaving them reserved only for the G packets coming from A, B, and C.

Figure 1: Aggregate Marking with Oversubscription

**Rate-limits for A, B, C:**

Packets under 1 Mbps marked TOS1

Packets between 1-2 Mbps marked with ToS value 20 (A only) or ToS value 30 (B, C)

All packets sent to rate limit S for check for ToS value 10

**Rate-limit S:**

Receives packets from A, B, C

Packets under 2 Mbps are not affected

Drops packets that exceed 6 Mbps rate

Demotes packets over 2 Mbps

**Configuration A**

Peak Rate: 2 Mbps

Committed rate: 1 Mbps

Committed action: transmit conditional

Conformed action: transmit conditional

Exceeded action: drop

G mark: TOS value 10

Y mark: **TOS value 20**R mark: **TOS value 20****Configuration B, C**

Peak Rate: 2 Mbps

Committed rate: 1 Mbps

Committed action: transmit conditional

Conformed action: transmit conditional

Exceeded action: drop

G mark: TOS value 10

Y mark: **TOS value 30**R mark: **TOS value 30****Configuration:**

Peak Rate: 6 Mbps

Committed rate: 2 Mbps

Committed action: transmit

Conformed action: transmit

Exceeded action: drop

Color-aware

```

host1(config)#rate-limit-profile indiv two-rate hierarchical
host1(config-rate-limit-profile)#committed-action transmit conditional
host1(config-rate-limit-profile)#conformed-action transmit conditional
host1(config-rate-limit-profile)#exceeded-action drop
host1(config-rate-limit-profile)#committed-rate 10000000
host1(config-rate-limit-profile)#peak-rate 20000000
host1(config-rate-limit-profile)#exit

```

```

host1(config)#rate-limit-profile S two-rate hierarchical
host1(config-rate-limit-profile)#committed-action transmit conditional
host1(config-rate-limit-profile)#conformed-action transmit conditional
host1(config-rate-limit-profile)#exceeded-action drop
host1(config-rate-limit-profile)#committed-rate 20000000
host1(config-rate-limit-profile)#peak-rate 60000000
host1(config-rate-limit-profile)#color-aware
host1(config-rate-limit-profile)#exit

```

```

host1(config)#ip color-mark-profile A
host1(config-color-mark-profile)#green-mark 10
host1(config-color-mark-profile)#yellow-mark 20
host1(config-color-mark-profile)#red-mark 20
host1(config-color-mark-profile)#exit

```

```

host1(config)#ip color-mark-profile BC
host1(config-color-mark-profile)#green-mark 10
host1(config-color-mark-profile)#yellow-mark 30
host1(config-color-mark-profile)#red-mark 30
host1(config-color-mark-profile)#exit

```

```

host1(config)#policy-list TOS10_oversubscribed

```

g016526

```
host1(config-policy-list)#classifier-group A parent-group S  
host1(config-policy-list-classifier-group)#rate-limit-profile indiv  
host1(config-policy-list-classifier-group)#mark profile A  
host1(config-policy-list-classifier-group)#exit
```

```
host1(config-policy-list)#classifier-group B parent-group S  
host1(config-policy-list-classifier-group)#rate-limit-profile indiv  
host1(config-policy-list-classifier-group)#mark profile BC  
host1(config-policy-list-classifier-group)#exit
```

```
host1(config-policy-list)#classifier-group C parent-group S  
host1(config-policy-list-classifier-group)#rate-limit-profile indiv  
host1(config-policy-list-classifier-group)#mark profile BC  
host1(config-policy-list-classifier-group)#exit
```

```
host1(config-policy-list)#parent-group S  
host1(config-policy-list-parent-group)#rate-limit-profile S  
host1(config-policy-list-parent-group)#exit
```

