



JUNOS® Software

Interfaces Command Reference

Release 9.4

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About This Guide

This preface provides the following guidelines for using the *JUNOS® Software Interfaces Command Reference*:

- Objectives on page xvii
- Audience on page xviii
- Supported Platforms on page xviii
- Using the Indexes on page xviii
- Documentation Conventions on page xix
- List of Technical Publications on page xx
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Objectives

This reference provides descriptions of the JUNOS software commands that you use to monitor and troubleshoot all interfaces on the router, including physical interfaces, service interfaces, the loopback interface, the management Ethernet interface, and the discard interface.

For additional commands, see these references:

- *JUNOS System Basics and Services Command Reference*
- *JUNOS Routing Protocols and Policies Command Reference*



NOTE: This guide documents Release 9.4 of the JUNOS software. For additional information about the JUNOS software—either corrections to or information that might have been omitted from this guide—see the software release notes at <http://www.juniper.net/>.

For information about configuration statements and guidelines related to the commands described in this reference, see the following configuration guides:

- *JUNOS Network Interfaces Configuration Guide*—Includes configuration statements for all router interfaces.
- *JUNOS Services Interfaces Configuration Guide*—Includes configuration statements and guidelines for services interfaces and features.

For information about related tasks performed by Network Operations Center (NOC) personnel, see the *JUNOS Interfaces Network Operations Guide*.

Audience

This guide is designed for network administrators who are configuring and monitoring a Juniper Networks M-series, MX-series, T-series, EX-series, or J-series router or switch.

To use this guide, you need a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. You must also be familiar with one or more of the following Internet routing protocols:

- Border Gateway Protocol (BGP)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Intermediate System-to-Intermediate System (IS-IS)
- Internet Control Message Protocol (ICMP) router discovery
- Internet Group Management Protocol (IGMP)
- Multiprotocol Label Switching (MPLS)
- Open Shortest Path First (OSPF)
- Protocol-Independent Multicast (PIM)
- Resource Reservation Protocol (RSVP)
- Routing Information Protocol (RIP)
- Simple Network Management Protocol (SNMP)

Personnel operating the equipment must be trained and competent; must not conduct themselves in a careless, willfully negligent, or hostile manner; and must abide by the instructions provided by the documentation.

Supported Platforms

For the features described in this manual, the JUNOS software currently supports the following platforms:

- J-series
- M-series
- MX-series
- T-series
- EX-series

Using the Indexes

This reference contains two indexes: a standard index with topic entries, and an index of commands.

Documentation Conventions

Table 1 on page xix defines notice icons used in this guide.

Table 1: Notice Icons





| Icon | Meaning | Description |
|---|--------------------|---|
|  | Informational note | Indicates important features or instructions. |
|  | Caution | Indicates a situation that might result in loss of data or hardware damage. |
|  | Warning | Alerts you to the risk of personal injury or death. |
|  | Laser warning | Alerts you to the risk of personal injury from a laser. |

Table 2 on page xix defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

| Convention | Description | Examples |
|------------------------------|--|--|
| Bold text like this | Represents text that you type. | To enter configuration mode, type the <code>configure</code> command: user@host> configure |
| Fixed-width text like this | Represents output that appears on the terminal screen. | user@host> show chassis alarms No alarms currently active |
| <i>Italic text like this</i> | <ul style="list-style-type: none"> Introduces important new terms. Identifies book names. Identifies RFC and Internet draft titles. | <ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>JUNOS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i> |
| <i>Italic text like this</i> | Represents variables (options for which you substitute a value) in commands or configuration statements. | Configure the machine's domain name: [edit] root@# set system domain-name domain-name |

Table 2: Text and Syntax Conventions (*continued*)

| Convention | Description | Examples |
|--------------------------------|---|--|
| Plain text like this | Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components. | <ul style="list-style-type: none">■ To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.■ The console port is labeled CONSOLE. |
| < > (angle brackets) | Enclose optional keywords or variables. | stub <default-metric <i>metric</i> >; |
| (pipe symbol) | Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity. | broadcast multicast (<i>string1</i> <i>string2</i> <i>string3</i>) |
| # (pound sign) | Indicates a comment specified on the same line as the configuration statement to which it applies. | rsvp { # Required for dynamic MPLS only |
| [] (square brackets) | Enclose a variable for which you can substitute one or more values. | community name members [<i>community-ids</i>] |
| Indentation and braces ({ }) | Identify a level in the configuration hierarchy. | [edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } } |
| ; (semicolon) | Identifies a leaf statement at a configuration hierarchy level. | |
| J-Web GUI Conventions | | |
| Bold text like this | Represents J-Web graphical user interface (GUI) items you click or select. | <ul style="list-style-type: none">■ In the Logical Interfaces box, select All Interfaces.■ To cancel the configuration, click Cancel. |
| > (bold right angle bracket) | Separates levels in a hierarchy of J-Web selections. | In the configuration editor hierarchy, select Protocols > Ospf . |

List of Technical Publications

Table 3 on page xxi lists the software and hardware guides and release notes for Juniper Networks M-series, MX-series, and T-series routing platforms and describes the contents of each document. Table 4 on page xxv lists the books included in the *Network Operations Guide* series. Table 5 on page xxv lists the manuals and release notes supporting JUNOS software for J-series and SRX-series platforms. All documents are available at <http://www.juniper.net/techpubs/>.

Table 6 on page xxvi lists additional books on Juniper Networks solutions that you can order through your bookstore. A complete list of such books is available at <http://www.juniper.net/books>.

Table 3: Technical Documentation for Supported Routing Platforms

| Book | Description |
|---|---|
| JUNOS Software for Supported Routing Platforms | |
| <i>Access Privilege</i> | Explains how to configure access privileges in user classes by using permission flags and regular expressions. Lists the permission flags along with their associated command-line interface (CLI) operational mode commands and configuration statements. |
| <i>Broadband Subscriber Management Solutions</i> | Describes residential subscriber management and how you can deploy solutions that include multisubscriber IP address assignment, service provisioning, authentication, authorization, accounting, and dynamic request services in your network |
| <i>Class of Service</i> | Provides an overview of the class-of-service (CoS) functions of the JUNOS software and describes how to configure CoS features, including configuring multiple forwarding classes for transmitting packets, defining which packets are placed into each output queue, scheduling the transmission service level for each queue, and managing congestion through the random early detection (RED) algorithm. |
| <i>CLI User Guide</i> | Describes how to use the JUNOS command-line interface (CLI) to configure, monitor, and manage Juniper Networks routing platforms. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> . |
| <i>Feature Guide</i> | Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software. |
| <i>High Availability</i> | Provides an overview of hardware and software resources that ensure a high level of continuous routing platform operation and describes how to configure high availability (HA) features such as nonstop active routing (NSR) and graceful Routing Engine switchover (GRES). |
| <i>MPLS Applications</i> | Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols. |
| <i>Multicast Protocols</i> | Provides an overview of multicast concepts and describes how to configure multicast routing protocols. |
| <i>Multiplay Solutions</i> | Describes how you can deploy IPTV and voice over IP (VoIP) services in your network. |
| <i>MX-series Layer 2 Configuration Guide</i> | Provides an overview of the Layer 2 functions of the MX-series routers, including configuring bridging domains, MAC address and VLAN learning and forwarding, and spanning-tree protocols. It also details the routing instance types used by Layer 2 applications. All of this material was formerly covered in the <i>JUNOS Routing Protocols Configuration Guide</i> . |

Table 3: Technical Documentation for Supported Routing Platforms (*continued*)

| Book | Description |
|--|--|
| <i>MX-series Layer 2 Solutions Guide</i> | Describes common configuration scenarios for the Layer 2 features supported on the MX-series routers, including basic bridged VLANs with normalized VLAN tags, aggregated Ethernet links, bridge domains, Multiple Spanning Tree Protocol (MSTP), and integrated routing and bridging (IRB). |
| <i>Network Interfaces</i> | Provides an overview of the network interface functions of the JUNOS software and describes how to configure the network interfaces on the routing platform. |
| <i>Network Management</i> | Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP and accounting options. |
| <i>Policy Framework</i> | Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, and forwarding options. |
| <i>Protected System Domain</i> | Provides an overview of the JCS 1200 platform and the concept of Protected System Domains (PSDs). The JCS 1200 platform, which contains up to six redundant pairs of Routing Engines running JUNOS software, is connected to a T320 router or to a T640 or T1600 routing node. To configure a PSD, you assign any number of Flexible PIC concentrators (FPCs) in the T-series routing platform to a pair of Routing Engines on the JCS 1200 platform. Each PSD has the same capabilities and functionality as a physical router, with its own control plane, forwarding plane, and administration. |
| <i>Routing Protocols</i> | Provides an overview of routing concepts and describes how to configure routing instances, and unicast routing protocols. |
| <i>Secure Configuration Guide for Common Criteria and JUNOS-FIPS</i> | Provides an overview of secure Common Criteria and JUNOS-FIPS protocols for the JUNOS software and describes how to install and configure secure Common Criteria and JUNOS-FIPS on a routing platform. |
| <i>Services Interfaces</i> | Provides an overview of the services interfaces functions of the JUNOS software and describes how to configure the services interfaces on the router. |
| <i>Software Installation and Upgrade Guide</i> | Describes the JUNOS software components and packaging and explains how to initially configure, reinstall, and upgrade the JUNOS system software. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> . |
| <i>Subscriber Access</i> | Provides an overview of the subscriber access features of the JUNOS software and describes how to configure subscriber access support on the router, including dynamic profiles, class of service, AAA, and access methods. |
| <i>System Basics</i> | Describes Juniper Networks routing platforms and explains how to configure basic system parameters, supported protocols and software processes, authentication, and a variety of utilities for managing your router on the network. |

Table 3: Technical Documentation for Supported Routing Platforms (*continued*)

| Book | Description |
|---|---|
| <i>VPNs</i> | Provides an overview and describes how to configure Layer 2 and Layer 3 virtual private networks (VPNs), virtual private LAN service (VPLS), and Layer 2 circuits. Provides configuration examples. |
| JUNOS References | |
| <i>Hierarchy and RFC Reference</i> | Describes the JUNOS configuration mode commands. Provides a hierarchy reference that displays each level of a configuration hierarchy, and includes all possible configuration statements that can be used at that level. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> . |
| <i>Interfaces Command Reference</i> | Describes the JUNOS software operational mode commands you use to monitor and troubleshoot interfaces. |
| <i>Routing Protocols and Policies Command Reference</i> | Describes the JUNOS software operational mode commands you use to monitor and troubleshoot routing policies and protocols, including firewall filters. |
| <i>System Basics and Services Command Reference</i> | Describes the JUNOS software operational mode commands you use to monitor and troubleshoot system basics, including commands for real-time monitoring and route (or path) tracing, system software management, and chassis management. Also describes commands for monitoring and troubleshooting services such as class of service (CoS), IP Security (IPsec), stateful firewalls, flow collection, and flow monitoring. |
| <i>System Log Messages Reference</i> | Describes how to access and interpret system log messages generated by JUNOS software modules and provides a reference page for each message. |
| J-Web User Guide | |
| <i>J-Web Interface User Guide</i> | Describes how to use the J-Web graphical user interface (GUI) to configure, monitor, and manage Juniper Networks routing platforms. |
| JUNOS API and Scripting Documentation | |
| <i>JUNOScript API Guide</i> | Describes how to use the JUNOScript application programming interface (API) to monitor and configure Juniper Networks routing platforms. |
| <i>JUNOS XML API Configuration Reference</i> | Provides reference pages for the configuration tag elements in the JUNOS XML API. |
| <i>JUNOS XML API Operational Reference</i> | Provides reference pages for the operational tag elements in the JUNOS XML API. |
| <i>NETCONF API Guide</i> | Describes how to use the NETCONF API to monitor and configure Juniper Networks routing platforms. |

Table 3: Technical Documentation for Supported Routing Platforms (*continued*)

| Book | Description |
|--|---|
| <i>JUNOS Configuration and Diagnostic Automation Guide</i> | Describes how to use the commit script and self-diagnosis features of the JUNOS software. This guide explains how to enforce custom configuration rules defined in scripts, how to use commit script macros to provide simplified aliases for frequently used configuration statements, and how to configure diagnostic event policies. |
| Hardware Documentation | |
| <i>Hardware Guide</i> | Describes how to install, maintain, and troubleshoot routing platforms and components. Each platform has its own hardware guide. |
| <i>PIC Guide</i> | Describes the routing platform's Physical Interface Cards (PICs). Each platform has its own PIC guide. |
| <i>DPC Guide</i> | Describes the Dense Port Concentrators (DPCs) for all MX-series routers. |
| JUNOScope Documentation | |
| <i>JUNOScope Software User Guide</i> | Describes the JUNOScope software graphical user interface (GUI), how to install and administer the software, and how to use the software to manage routing platform configuration files and monitor routing platform operations. |
| Advanced Insight Solutions (AIS) Documentation | |
| <i>Advanced Insight Solutions Guide</i> | Describes the Advanced Insight Manager (AIM) application, which provides a gateway between JUNOS devices and Juniper Support Systems (JSS) for case management and intelligence updates. Explains how to run AI-Scripts on Juniper Networks devices. |
| Release Notes | |
| <i>JUNOS Release Notes</i> | Summarize new features and known problems for a particular software release, provide corrections and updates to published JUNOS, JUNOScript, and NETCONF manuals, provide information that might have been omitted from the manuals, and describe upgrade and downgrade procedures. |
| <i>Hardware Release Notes</i> | Describe the available documentation for the routing platform and summarize known problems with the hardware and accompanying software. Each platform has its own release notes. |
| <i>JUNOScope Release Notes</i> | Contain corrections and updates to the published JUNOScope manual, provide information that might have been omitted from the manual, and describe upgrade and downgrade procedures. |
| <i>AIS Release Notes</i> | Summarize AIS new features and guidelines, identify known and resolved problems, provide information that might have been omitted from the manuals, and provide initial setup, upgrade, and downgrade procedures. |
| <i>AIS AI-Scripts Release Notes</i> | Summarize AI-Scripts new features, identify known and resolved problems, provide information that might have been omitted from the manuals, and provide instructions for automatic and manual installation, including deleting and rolling back. |

Table 4: JUNOS Software Network Operations Guides

| Book | Description |
|---------------------------|--|
| <i>Baseline</i> | Describes the most basic tasks for running a network using Juniper Networks products. Tasks include upgrading and reinstalling JUNOS software, gathering basic system management information, verifying your network topology, and searching log messages. |
| <i>Interfaces</i> | Describes tasks for monitoring interfaces. Tasks include using loopback testing and locating alarms. |
| <i>MPLS</i> | Describes tasks for configuring, monitoring, and troubleshooting an example MPLS network. Tasks include verifying the correct configuration of the MPLS and RSVP protocols, displaying the status and statistics of MPLS running on all routing platforms in the network, and using the layered MPLS troubleshooting model to investigate problems with an MPLS network. |
| <i>MPLS Log Reference</i> | Describes MPLS status and error messages that appear in the output of the <code>show mpls lsp extensive</code> command. The guide also describes how and when to configure Constrained Shortest Path First (CSPF) and RSVP trace options, and how to examine a CSPF or RSVP failure in a sample network. |
| <i>MPLS Fast Reroute</i> | Describes operational information helpful in monitoring and troubleshooting an MPLS network configured with fast reroute (FRR) and load balancing. |
| <i>Hardware</i> | Describes tasks for monitoring M-series and T-series routing platforms. |

To configure and operate a J-series Services Router or an SRX-series Services Gateway running JUNOS software, you must also use the configuration statements and operational mode commands documented in JUNOS configuration guides and command references. To configure and operate a WX Integrated Services Module, you must also use WX documentation.

Table 5: JUNOS Software for J-series Services Routers and SRX-series Services Gateways Documentation

| Book | Description |
|--|---|
| J-series and SRX-series Platforms | |
| <i>JUNOS Software Interfaces and Routing Configuration Guide</i> | Explains how to configure SRX-series and J-series interfaces for basic IP routing with standard routing protocols, ISDN service, firewall filters (access control lists), and class-of-service (CoS) traffic classification. |
| <i>JUNOS Software Security Configuration Guide</i> | Explains how to configure and manage SRX-series and J-series security services such as stateful firewall policies, IPsec VPNs, firewall screens, Network Address Translation (NAT), Public Key Cryptography, chassis clusters, Application Layer Gateways (ALGs), and Intrusion Detection and Prevention (IDP). |

Table 5: JUNOS Software for J-series Services Routers and SRX-series Services Gateways Documentation (continued)

| Book | Description |
|--|---|
| <i>JUNOS Software Administration Guide</i> | Shows how to monitor SRX-series and J-series devices and routing operations, firewall and security services, system alarms and events, and network performance. This guide also shows how to administer user authentication and access, upgrade software, and diagnose common problems. |
| <i>JUNOS Software CLI Reference</i> | Provides the complete configuration hierarchy available on SRX-series and J-series devices. This guide also describes the configuration statements and operational mode commands unique to these devices. |
| <i>JUNOS Release Notes</i> | Summarize new features and known problems for a particular release of JUNOS software, including JUNOS software for J-series and SRX-series devices. The release notes also contain corrections and updates to the manuals and software upgrade and downgrade instructions for JUNOS software. |
| J-series Only | |
| <i>JUNOS Software Design and Implementation Guide</i> | Provides guidelines and examples for designing and implementing IPsec VPNs, firewalls, and routing on J-series Services Routers running JUNOS software. |
| <i>J-series Services Routers Quick Start</i> | Explains how to quickly set up a J-series Services Router. This document contains router declarations of conformity. |
| <i>JUNOS Software with Enhanced Services J-series Services Router Hardware Guide</i> | Provides an overview, basic instructions, and specifications for J-series Services Routers. This guide explains how to prepare a site, unpack and install the router, replace router hardware, and establish basic router connectivity. This guide contains hardware descriptions and specifications. |
| <i>JUNOS Software Migration Guide</i> | Provides instructions for migrating an SSG device running ScreenOS software to JUNOS software or upgrading a J-series device to a later version of the JUNOS software. |
| <i>WXC Integrated Services Module Installation and Configuration Guide</i> | Explains how to install and initially configure a WXC Integrated Services Module in a J-series Services Router for application acceleration. |

Table 6: Additional Books Available Through <http://www.juniper.net/books>

| Book | Description |
|--------------------------------------|---|
| <i>Interdomain Multicast Routing</i> | Provides background and in-depth analysis of multicast routing using Protocol Independent Multicast sparse mode (PIM SM) and Multicast Source Discovery Protocol (MSDP); details any-source and source-specific multicast delivery models; explores multiprotocol BGP (MBGP) and multicast IS-IS; explains Internet Gateway Management Protocol (IGMP) versions 1, 2, and 3; lists packet formats for IGMP, PIM, and MSDP; and provides a complete glossary of multicast terms. |

Table 6: Additional Books Available Through <http://www.juniper.net/books> (continued)

| Book | Description |
|---|--|
| <i>JUNOS Cookbook</i> | Provides detailed examples of common JUNOS software configuration tasks, such as basic router configuration and file management, security and access control, logging, routing policy, firewalls, routing protocols, MPLS, and VPNs. |
| <i>MPLS-Enabled Applications</i> | Provides an overview of Multiprotocol Label Switching (MPLS) applications (such as Layer 3 virtual private networks [VPNs], Layer 2 VPNs, virtual private LAN service [VPLS], and pseudowires), explains how to apply MPLS, examines the scaling requirements of equipment at different points in the network, and covers the following topics: point-to-multipoint label switched paths (LSPs), DiffServ-aware traffic engineering, class of service, interdomain traffic engineering, path computation, route target filtering, multicast support for Layer 3 VPNs, and management and troubleshooting of MPLS networks. |
| <i>OSPF and IS-IS: Choosing an IGP for Large-Scale Networks</i> | Explores the full range of characteristics and capabilities for the two major link-state routing protocols: Open Shortest Path First (OSPF) and IS-IS. Explains architecture, packet types, and addressing; demonstrates how to improve scalability; shows how to design large-scale networks for maximum security and reliability; details protocol extensions for MPLS-based traffic engineering, IPv6, and multipoint-to-multipoint routing; and covers troubleshooting for OSPF and IS-IS networks. |
| <i>Routing Policy and Protocols for Multivendor IP Networks</i> | Provides a brief history of the Internet, explains IP addressing and routing (Routing Information Protocol [RIP], OSPF, IS-IS, and Border Gateway Protocol [BGP]), explores ISP peering and routing policies, and displays configurations for both Juniper Networks and other vendors' routers. |
| <i>The Complete IS-IS Protocol</i> | Provides the insight and practical solutions necessary to understand the IS-IS protocol and how it works by using a multivendor, real-world approach. |

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document name
- Document part number
- Page number
- Software release version (not required for *Network Operations Guides [NOGs]*)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- 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.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- 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 Management tool: <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 Management tool in the CSC at <http://www.juniper.net/cm/> .
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at <http://www.juniper.net/support/requesting-support.html>.

Part 1

About Interfaces

- Interface Types on page 3
- Common Interface Commands on page 25
- Common Output Fields on page 87

Chapter 1

Interface Types

This chapter provides information about the following topics:

- Interface Naming Conventions on page 3
- Discard Interface on page 8
- Loopback Interface on page 8
- Management Ethernet and Internal Ethernet Interfaces on page 8
- Nonconfigurable Interfaces on page 9
- Physical Interfaces on page 10
- Logical Interfaces Assigned to a Logical System on page 15
- Services Interfaces on page 20
- Container Interfaces on page 23

Interface Naming Conventions

This section discusses the following topics:

- Physical Part of an Interface Name on page 3
- Logical Part of an Interface Name on page 4
- Channel Identifier Part of an Interface Name on page 5
- Wildcard Characters in Interface Names on page 5

Physical Part of an Interface Name

The M-series and T-series routing platforms use one convention, whereas the J-series routing platform uses another, as described in the following sections:

- M-series and T-series Interface Names on page 3
- MX-series Interface Names on page 4
- J-series Interface Names on page 4

M-series and T-series Interface Names

On the M-series and T-series platforms, when you display information about an interface, you specify the interface type, the slot in which the Flexible PIC

Concentrator (FPC) is installed, the slot on the FPC in which the Physical Interface Card (PIC) is located, and the configured port number.

In the physical part of the interface name, a hyphen (-) separates the media type from the FPC number, and a slash (/) separates the FPC, PIC, and port numbers:

type-fpc/pic/port



NOTE: Exceptions to the *type-fpc/pic/port* physical description include the aggregated Ethernet and aggregated SONET/SDH interfaces, which use the syntax *aenumber* and *asnumber*, respectively.

MX-series Interface Names

On the MX-series routers when you display information about an interface, you specify the interface type, the slot in which the Dense Port Concentrator (DPC) is installed, the slot on the DPC in which the Physical Interface Card (PIC) is located, and the configured port number.

In the physical part of the interface name, a hyphen (—) separates the media type from the FPC number, and a slash (/) separates the DPC, PIC, and port numbers:

type-dpc/pic/port



NOTE: Although the MX-series uses DPCs, command syntax in this book is shown as *fpc/pic/port* for simplicity.

J-series Interface Names

On the J-series routing platform, when you display information about an interface, you specify the interface type, the slot in which the Physical Interface Module (PIM) is installed, 0, and the configured port number.

In the physical part of the interface name, a hyphen (-) separates the media type from the PIM number, and a slash (/) separates the PIM, 0, and port numbers:

type-pim/0/port



NOTE: An exception to the *type-pim/0/port* physical description is the Integrated Services Digital Network (ISDN) dialer interface, which uses the syntax *dlnumber*.

Logical Part of an Interface Name

The logical unit part of the interface name corresponds to the logical unit number, which can be a number from 0 through 16384. In the virtual part of the name, a period (.) separates the port and logical unit numbers:

- M-series and T-series routing platforms:

type-fpc/pic/port.logical

- J-series routing platform:

type-pim/0/port.logical

Channel Identifier Part of an Interface Name

The channel identifier part of the interface name is required only on channelized interfaces. For channelized interfaces, channel 0 identifies the first channelized interface. For channelized intelligent queuing (IQ) interfaces, channel 1 identifies the first channelized interface.



NOTE: Depending on the type of channelized interface, up to three levels of channelization can be specified. For more information, see the *JUNOS Network Interfaces Configuration Guide*.

A colon (:) separates the physical and virtual parts of the interface name:

- M-series and T-series routing platforms:

type-fpc/pic/port:channel
type-fpc/pic/port:channel:channel
type-fpc/pic/port:channel:channel:channel

- J-series routing platforms

type-pim/0/port:channel
type-pim/0/port:channel:channel
type-pim/0/port:channel:channel:channel

Wildcard Characters in Interface Names

In the `show interfaces` and `clear interfaces` commands, you can use wildcard characters in the *interface-name* option to specify groups of interface names without having to type each name individually. Table 7 on page 5 lists the available wildcard characters. You must enclose all wildcard characters except the asterisk (*) in quotation marks (" ").

Table 7: Wildcard Characters for Specifying Interface Names

| Wildcard Character | Description |
|-----------------------------|---|
| * (asterisk) | Match any string of characters in that position in the interface name. For example, <code>so*</code> matches all SONET/SDH interfaces. |
| "[character<character...>]" | Match one or more individual characters in that position in the interface name. For example, <code>so-[03]*</code> matches all SONET/SDH interfaces in slots 0 and 3. |

Table 7: Wildcard Characters for Specifying Interface Names (continued)

| Wildcard Character | Description |
|-------------------------------------|---|
| "[!character<character...>]" | Match all characters except the ones included in the brackets. For example, <code>so-"[!03]"</code> matches all SONET/SDH interfaces except those in slots 0 and 3. |
| "[character1-character1character2]" | Match a range of characters. For example, <code>so-"[0-3]"</code> matches all SONET/SDH interfaces in slots 0, 1, 2, and 3. |
| "[!character1-character2]" | Match all characters that are not in the specified range of characters. For example, <code>so-"[!0-3]"</code> matches all SONET/SDH interfaces in slots 4, 5, 6, and 7. |

The following examples illustrate the use of wildcards with operational mode commands:

```

show interfaces terse
(SONET/SDH Interfaces)
user@host> show interfaces terse so*
Interface      Admin Link Proto Local Remote
so-1/0/0       up    up    inet  192.168.8.192 --> 192.168.2.250
so-1/0/0.0     up    up    iso
so-1/1/0       up    down
so-1/1/0.0     up    down inet  192.168.8.109/30
so-1/1/1       up    up
so-1/1/1.0     up    down inet  192.168.8.113/30
so-1/1/1.0.0   up    down iso
so-1/1/1.0.0.0 up    down mpls
...
so-1/3/3       up    down
so-5/0/0       up    up
so-5/0/0.0     up    down inet  192.168.8.208 --> 192.168.8.209
so-5/0/0.0.0   up    down iso
so-5/0/0.0.0.0 up    down mpls
so-5/0/1       down down
so-5/0/2       up    down
...

show interfaces terse
(SONET/SDH Interfaces in Slot 1)
user@host> show interfaces terse so-"[1]"*
Interface      Admin Link Proto Local Remote
so-1/0/0       up    up    inet  192.168.2.125 --> 192.168.2.250
so-1/0/0.0     up    up    iso
so-1/1/0       up    down
so-1/1/0.0     up    down inet  192.168.2.150/30
so-1/1/1       up    up
so-1/1/1.0     up    down inet  192.168.2.175/30
so-1/1/1.0.0   up    down iso
so-1/1/1.0.0.0 up    down mpls
so-1/1/2       up    up
so-1/1/2.0     up    down inet  192.168.2.110/30
so-1/1/2.0.0   up    down iso
so-1/2/0       up    down

```

show interfaces terse
(All Interface Types
Starting with “S” or “G”)

```

user@host> show interfaces terse "[sg]"*
Interface      Admin Link Proto Local                               Remote
so-1/0/0       up    up    inet 192.168.2.125                       --> 192.168.2.250
so-1/0/0.0     up    up    inet iso
so-1/1/0       up    down
so-1/1/0.0     up    down inet 192.168.2.150/30
so-1/1/1       up    up
so-1/1/1.0     up    down inet 192.168.2.175/30
so-1/1/2       up    up
...
so-5/1/3       up    down
gre            up    up

```

Discard Interface

The discard (**dsc**) interface is not a physical interface, but a virtual interface that discards packets. You can configure one discard interface. This interface allows you to identify the ingress point of a denial-of-service (DoS) attack. When your network is under attack, the target host IP address is identified, and the local policy forwards attacking packets to the discard interface. Traffic routed out of the discard interface is silently discarded.

For more information, see “Discard Interface Operational Mode Commands” on page 721.

Loopback Interface

The JUNOS software automatically configures one loopback interface (**lo0**), choosing the first interface to come online as the default. You can also configure the loopback interface.

When you enter the **show interfaces** command, the loopback interface and its logical interfaces are displayed:

```
user@host> show interfaces ?
...
lo0
lo0.0
lo0.16385
...
```

The logical interface **lo0.16385** is a nonconfigurable interface for routing platform control traffic.

For more information, see “Loopback Interface Operational Mode Commands” on page 727.

Management Ethernet and Internal Ethernet Interfaces

The M-series and T-series routing platforms have both a management Ethernet interface and one or two internal Ethernet interfaces. The J-series routing platform has a management Ethernet interface. These interfaces are described in the following sections:

- M-series, MX-series, and T-series Management Ethernet and Internal Ethernet Interfaces on page 9
- J-series Management Ethernet Interface on page 9

For more information, see “Management Ethernet and Internal Ethernet Interface Operational Mode Commands” on page 735.

M-series, MX-series, and T-series Management Ethernet and Internal Ethernet Interfaces

The JUNOS software automatically creates the routing platform's management Ethernet interface, **fxp0**, which is an out-of-band management interface for connecting to the router. To use **fxp0** as a management port, you must configure its logical interface, **fxp0.0**, with a valid IP address.

The JUNOS software also creates the internal Ethernet interface, **fxp1**, which connects the Routing Engine (**re0**) to the Packet Forwarding Engine. If the routing platform has redundant Routing Engines, another internal Ethernet interface, **fxp2**, is created on each Routing Engine (**re0** and **re1**) in order to support fault tolerance. Two physical links between **re0** and **re1** connect the independent control planes. If one of the links fails, both Routing Engines can use the other link for IP communication.

When you enter the **show interfaces** command, the management Ethernet and internal Ethernet interfaces (and logical interfaces) are displayed:

```
user@host> show interfaces ?
...
fxp0
fxp0.0
fxp1
fxp1.0
fxp2
fxp2.0
...
```

J-series Management Ethernet Interface

The JUNOS software automatically creates the routing platform's management Ethernet interfaces, **ge-0/0/0** through **ge-0/0/3**, which are out-of-band management interfaces for connecting to the router. To use any of these interfaces as a management port, you must configure a corresponding logical interface, such as **ge-0/0/0.0**, with a valid IP address. When you enter the **show interfaces** command, the management Ethernet interfaces (and logical interfaces) are displayed:

```
user@host> show interfaces
...
ge-0/0/0
ge-0/0/0.0
...
```

Nonconfigurable Interfaces

The JUNOS software internally generates the nonconfigurable interfaces described in Table 8 on page 10. For information about related configurable tunnel interfaces, see “Services Interfaces” on page 20.



NOTE: M-series and T-series services interfaces are indicated by *type-fpc/pic/port*, whereas J-series services interfaces use the *type-pim/0/port* syntax.

Table 8: Nonconfigurable Interfaces

| Syntax | Description | Related Configurable Tunnel Interface |
|-------------------|---|---|
| <code>gre</code> | This generic routing encapsulation (GRE) interface is nonconfigurable, except when you use it as the control channel for Generalized MPLS (GMPLS). See the <i>JUNOS MPLS Applications Configuration Guide</i> . | <code>gr-fpc/pic/port/</code> <code>gr-pim/0/port</code> |
| <code>ipip</code> | IP over IP (IP-IP) interface. | <code>ip-fpc/pic/port</code> <code>ip-pim/0/port</code> |
| <code>lsi</code> | Label-switched interface. In the system, each label-switched path (LSP) is treated as an interface. | – |
| <code>mtun</code> | Multicast tunnel interface. | <code>mt-fpc/pic/port</code> <code>mt-pim/0/port</code> |
| <code>pimd</code> | PIM de-encapsulation interface. | <code>pd-fpc/pic/port port</code> <code>pd-pim/0/port</code> |
| <code>pime</code> | PIM encapsulation interface. | <code>pe-fpc/pic/port</code> <code>pe-pim/0/port</code> |
| <code>tap</code> | When packets are discarded by the Packet Forwarding Engine (for example, because of a firewall filter), they are placed on this interface. | – |

Physical Interfaces

On M-series and T-series routing platforms, physical interfaces are installed on PICs and use the syntax *type-fpc/pic/port*. On the J-series routing platform, physical interfaces are installed on PIMs and use the syntax *type-pim/0/port*. Physical interfaces are described in the following sections:

- M-series and T-series Physical Interfaces on page 10
- MX-series Physical Interfaces on page 13
- J-series Physical Interfaces on page 14

M-series and T-series Physical Interfaces

Table 9 on page 11 lists the physical interfaces that are supported on the M-series and T-series routing platforms.

Table 9: M-series and T-series Physical Interfaces

| Physical Interface | Syntax | PIC |
|----------------------------|---------------------------|-----------------------------|
| Aggregated Ethernet | <i>aenumber</i> | Fast Ethernet |
| | | Gigabit Ethernet |
| Aggregated SONET/SDH | <i>asnumber</i> | SONET/SDH (all OC/STM) |
| ATM | <i>at-fpc/pic/port</i> | ATM1 and ATM2 IQ (all) |
| Channelized AU-4 | <i>cau4-fpc/pic/port</i> | Channelized OC12 IQ and IQE |
| | | Channelized STM1 IQ and IQE |
| Channelized E1 IQ | <i>ce1-fpc/pic/port</i> | Channelized E1 IQ |
| | | Channelized STM1 IQ |
| Channelized OC1 IQ and IQE | <i>coc1-fpc/pic/port</i> | Channelized OC3 IQ and IQE |
| | | Channelized OC12 IQ and IQE |
| Channelized OC3 IQ and IQE | <i>coc3-fpc/pic/port</i> | Channelized OC3 IQ and IQE |
| Channelized OC12 IQ | <i>coc12-fpc/pic/port</i> | Channelized OC12 IQ |
| Channelized STM1 IQ | <i>cstm1-fpc/pic/port</i> | Channelized STM1 IQ |
| Channelized STM4 IQ | <i>cstm4-fpc/pic/port</i> | Channelized OC12 IQ |
| Channelized T1 IQ | <i>ct1-fpc/pic/port</i> | Channelized DS3 IQ |
| | | Channelized OC3 IQ |
| | | Channelized OC12 IQ |
| | | Channelized T1 IQ |
| Channelized T3 IQ | <i>ct3-fpc/pic/port</i> | Channelized DS3 IQ |
| | | Channelized OC3 IQ |
| | | Channelized OC12 IQ |

Table 9: M-series and T-series Physical Interfaces (*continued*)

| Physical Interface | Syntax | PIC |
|---|-------------------------|---------------------------------------|
| DS0 | <i>ds-fpc/pic/port</i> | Channelized DS3-to-DS0 |
| | | Channelized DS3 IQ |
| | | Channelized E1 |
| | | Channelized E1 IQ |
| | | Channelized OC3 IQ |
| | | Channelized OC12 IQ |
| | | Channelized STM1 IQ |
| | | Channelized T1 IQ Multichannel DS3 |
| E1 | <i>e1-fpc/pic/port</i> | Channelized E1 IQ |
| | | Channelized STM1 |
| | | Channelized STM1 IQ |
| | | E1 |
| E3 | <i>e3-fpc/pic/port</i> | E3 |
| | | E3 IQ |
| Fast Ethernet | <i>fe-fpc/pic/port</i> | Fast Ethernet |
| Gigabit Ethernet | <i>ge-fpc/pic/port</i> | Gigabit Ethernet |
| | <i>xe-fpc/pic/port</i> | 10-Gigabit Ethernet |
| OC3 IQ and IQE | <i>oc3-fpc/pic/port</i> | Channelized OC3 IQ and IQE |
| | | Channelized OC12 IQ and IQE |
| Point-to-Point Protocol over Ethernet (PPPoE) | <i>pp0</i> | Gigabit Ethernet, 10-Gigabit Ethernet |
| Serial (EIA-530, V.35, and X.21) | <i>se-fpc/pic/port</i> | Serial |
| SONET/SDH | <i>so-fpc/pic/port</i> | Channelized OC3 IQ and IQE |
| | | Channelized OC12 IQ and IQE |
| | | SONET/SDH (all OC/STM) |

Table 9: M-series and T-series Physical Interfaces (*continued*)

| Physical Interface | Syntax | PIC |
|--------------------|------------------------|-----------------------------|
| T1 | <i>t1-fpc/pic/port</i> | Channelized DS3-to-DS1 |
| | | Channelized DS3 IQ and IQE |
| | | Channelized OC3 IQ and IQE |
| | | Channelized OC12 IQ and IQE |
| | | Channelized T1 IQ and IQE |
| | | Multichannel DS3 |
| | | T1 (all) |
| T3 | <i>t3-fpc/pic/port</i> | Channelized DS3 IQ and IQE |
| | | Channelized OC3 IQ and IQE |
| | | Channelized OC12 and IQE |
| | | Channelized OC12 IQ and IQE |
| | | DS3 |
| | | T3 (all) |

MX-series Physical Interfaces

Table 10 on page 13 lists the physical interfaces that are supported on the MX-series routers.

Table 10: MX-series Physical Interfaces

| Physical Interface | Syntax | PIC or DPC |
|---------------------|------------------------|--------------------------|
| Aggregated Ethernet | <i>ae number</i> | Fast Ethernet |
| | | Tri-Rate Ethernet copper |
| | | Gigabit Ethernet |
| Fast Ethernet | <i>fe-fpc/pic/port</i> | Fast Ethernet |

Table 10: MX-series Physical Interfaces (continued)

| Physical Interface | Syntax | PIC or DPC |
|--------------------|------------------------|--------------------------|
| Gigabit Ethernet | <i>ge-fpc/pic/port</i> | Tri-Rate Ethernet copper |
| | | Multi-Rate DPCs |
| | | Gigabit Ethernet |
| | <i>xe-fpc/pic/port</i> | 10-Gigabit Ethernet |
| | | Multi-Rate DPCs |

J-series Physical Interfaces

Table 11 on page 14 lists the physical interfaces that are supported on the J-series routing platform.

Table 11: J-series Physical Interfaces

| Physical Interface | Syntax | PIM |
|--|-------------------------|---|
| Asynchronous Transfer Mode-over-asymmetrical DSL (ATM-over-ADSL) | <i>at-pim/0/port</i> | ADSL (Annex A and B) |
| ATM-over-symmetric high-speed DSL (ATM-over-SHDSL) | <i>at-pim/0/port</i> | G.SHDSL (Annex A and B) |
| Channelized E1 | <i>ce1-pim/0/port</i> | Dual-Port Channelized E1 |
| Channelized T1 | <i>ct1-port/0/port</i> | Dual-Port Channelized T1 |
| B-channel | <i>bc-pim/0/port</i> | 4-Port Integrated Services Digital Network (ISDN) BRI |
| Basic Rate Interface (BRI) | <i>br-pim/0/port</i> | |
| D-channel | <i>dc-pim/0/portpim</i> | |
| Dialer | <i>dlnumber</i> | |
| E1 | <i>e1-pim/0/port</i> | Dual-Port E1 |
| E3 | <i>e3-pim/0/port</i> | E3 |
| Fast Ethernet | <i>fe-pim/0/port</i> | Dual-Port Fast Ethernet |
| Gigabit Ethernet | <i>ge-pim/0/port</i> | Gigabit Ethernet |
| Point-to-Point Protocol over Ethernet 0 | <i>pp0</i> | Fast Ethernet |
| Serial (RS-232, RS-422/449, EIA-530, V.35, and X.21) | <i>se-pim/0/port</i> | Dual-Port Serial |

Table 11: J-series Physical Interfaces *(continued)*

| Physical Interface | Syntax | PIM |
|--------------------|----------------------------|--------------|
| T1 | <code>t1-pim/0/port</code> | Dual-Port T1 |
| T3 | <code>t3-pim/0/port</code> | T3 (all) |



NOTE: ADSL interfaces and SHDSL interfaces are supported on the J-series routing platform only. Both interfaces are configured over an underlying ATM interface. For more information, see “ATM Interface Operational Mode Commands” on page 397.



NOTE: Point-to-Point Protocol over Ethernet (PPPoE) interfaces (`pp0`) are supported on the J-series routing platform and the M120 Internet router only. A PPPoE interface is configured over an underlying Ethernet interface. For more information, see “PPPoE Interface Operational Mode Commands” on page 305.

Logical Interfaces Assigned to a Logical System

Logical interfaces assigned to a logical system are described in the following sections:

- Logical Systems Overview on page 15
- Logical System Configuration Overview on page 16
- Scope of Logical System Administration on page 16

Logical Systems Overview

With JUNOS software, you can partition a single physical system into multiple logical systems that perform independent routing tasks. Each logical system has its own unique routing tables, interfaces, policies, and routing instances. A set of logical systems within a single router can handle the functions otherwise performed by several small routers, offering an effective way to maximize the use of a single routing or switching platform.



NOTE: A virtual router does not have the same capabilities as a logical system. A virtual router is a type of simplified routing instance that has a single routing table. By contrast, a logical system is a partition of the main router and can contain multiple virtual router routing instances. As a result, these two entities are not equivalent.

For additional information about logical system configuration and administration, see the *JUNOS Feature Guide* and the *JUNOS System Basics Configuration Guide*.

For additional information about logical system interface configuration, see the *JUNOS Network Interfaces Configuration Guide* and the *JUNOS Services Interfaces Configuration Guide*.

Logical System Configuration Overview

Configuring a logical system consists of a sequence of tasks, some of which can only be performed by you as the master administrator—a JUNOS user with superuser configuration and verification privileges on the router. Other tasks can be performed by a *logical system administrator*—a JUNOS user that you have assigned to the logical system and is thereby granted configuration and verification privileges for only the logical systems to which that user is assigned. The following sequence summarizes the steps required to configure a logical system:

1. To configure a logical system, you (as the master administrator) first specify a *logical-system-name* at the [edit logical-systems] hierarchy level.
2. For any logical system, you (as the master administrator) can assign one or more logical system administrators. To configure logical system administrators, include the logical-system *logical-system-name* statement at the [edit system login class *class-name*] hierarchy level.
3. The minimum configuration of a logical system includes one or more logical interfaces. Before any logical interfaces can be assigned to a logical system, though, you (as the master administrator) must configure physical interface properties (such as encapsulation types and interfaces-related options) on the main router. To configure physical interface properties on the main router, include the physical interface statements at the [edit interfaces *interface-name*] hierarchy level.
4. After the physical interface properties are configured on the main router, logical system configurations can be completed by assigning one or more logical interfaces to each logical system. For any logical system, either you or a logical system administrator of that logical system can assign logical interfaces. To configure, include the unit statement at the [edit logical-systems *logical-system-name*] hierarchy level.



NOTE: After you assign a logical interface to a logical system, it is considered part of the logical system. As such, any logical interface can be assigned to only one logical system.

For additional information about logical system configuration and administration, see the *JUNOS Feature Guide* and the *JUNOS System Basics Configuration Guide*.

For additional information about logical system interface configuration, see the *JUNOS Network Interfaces Configuration Guide* and the *JUNOS Services Interfaces Configuration Guide*.

Scope of Logical System Administration

Logical system administrators are confined to the context of the logical systems to which they are assigned. Any global configuration statements are restricted from them, and command output is restricted to the context to which the logical system administrators are assigned.

For JUNOS software Release 9.1 and later, when a physical interface is specified within a logical system context, the **show interfaces** command output only displays information about the logical interfaces assigned to that logical system.

From within the context of a logical system (which you can select from the main router context by using the **set cli logical-systems *logical-system-name*** command), the **show interfaces** command output is limited to the resources assigned to the logical system:

- The physical interfaces are listed by name, but no statistics are displayed.
- Only the logical interfaces assigned to the logical system are listed, with statistics displayed.
- None of the special, system-generated logical interfaces with logical unit number 32767 are listed.

At the main router level (to which you can return from the logical system context by using the **clear cli logical system** command), the **show interfaces** command output displays statistics for all interfaces configured on the router:

- Statistics are displayed for all physical interfaces.
- Statistics are displayed for all logical interfaces.
- Statistics are displayed for all system-generated logical interfaces with logical unit number 32767.

Example: show interfaces terse

Consider a main router for which you have configured the physical interface **at-0/0/0** with ATM-specific physical interface properties and configured the physical interface with a logical interface at logical unit 0. You have also configured logical system **ls1** and assigned a logical system administrator for this logical system. The logical system administrator has assigned the logical interface **at-0/0/0.0** to logical system **ls1**. The configuration is as follows:

```
logical-systems {
  ls1 {
    interfaces {
      at-0/0/0 {
        unit 0 {
          encapsulation atm-ccc-cell-relay;
          vpi 0;
        }
      }
    }
    protocols {
      mpls {
        label-switched-path base_config_r4r1_lsp {
          to 10.255.65.65;
        }
        interface all;
      }
    }
    connections {
      remote-interface-switch base_config_vp_mode_connection {
```

```

        interface at-0/0/0.0;
        transmit-lsp base_config_r1r4_lsp;
        receive-lsp base_config_r4r1_lsp;
    }
}
}
}
}
chassis {
    fpc 0 {
        pic 0 {
            atm-l2circuit-mode {
                cell;
            }
        }
    }
}
interfaces {
    at-0/0/0 {
        atm-options {
            pic-type atm2;
            promiscuous-mode {
                vpi 0;
            }
        }
        inactive: unit 0 {
            encapsulation atm-ccc-cell-relay;
            vpi 0;
        }
    }
}
protocols {
    mpls {
        interface all;
    }
    isis {
        disable;
        interface all {
            level 1 disable;
            level 2 metric 10;
        }
        interface fxp0.0 {
            disable;
        }
    }
    ospf {
        reference-bandwidth 4g;
        area 0.0.0.0 {
            interface all;
            interface fxp0.0 {
                disable;
            }
        }
    }
}
}

```

Within the context of a logical system, logical system administration is confined to the resources assigned to that logical system.

- The following example shows the output of the **show interfaces terse** command when you (as the master administrator) issue the command from the context of the main router:

```
user@host> show interfaces terse at-0/0/0
```

| Interface | Admin | Link | Proto | Local | Remote |
|----------------|-------|------|-------|-------|--------|
| at-0/0/0 | up | up | | | |
| at-0/0/0.0 | up | up | ccc | | |
| at-0/0/0.32767 | up | up | | | |

The physical interface name **at-0/0/0** is reported, followed by all requested information (in the case of the **show interfaces terse** command, the Admin and Link states) about the physical interface.

The logical interface name **at-0/0/0.0** is reported, followed by all requested information.

The output also displays all requested information about the special, system-generated logical interface **at-0/0/0.32767**, which the JUNOS software uses for handling traffic that is not part of the interface. In the case of the ATM interface **at-0/0/0**, which is configured for cell-relay promiscuous virtual path identifier (VPI) mode, the system-generated logical interface **at-0/0/0.32767** is used to track statistics associated with system-generated traffic, such as Operation, Administration, and Management (OAM) F4 cell flows.



NOTE: The **show interfaces extensive** command output displays the individual channel statistics associated with the special **.32767** logical interface, but only when the command is issued from the context of the main router.

- The following example shows how you can place yourself into the context of logical system **ls1**:

```
user@host> set cli logical-system ls1
```

```
Logical system: ls1
```

```
user@host:ls1>
```

- The following example shows the output of the **show interfaces terse** operational command when you (as the master administrator) issue it from the context of logical system **ls1** or when it is issued by a logical system administrator for the logical system **ls1**:

```
user@host:ls1> show interfaces terse at-0/0/0
```

| Interface | Admin | Link | Proto | Local | Remote |
|------------|-------|------|-------|-------|--------|
| at-0/0/0 | | | | | |
| at-0/0/0.0 | up | up | ccc | | |

The physical interface name `at-0/0/0` is reported, but any additional details about the physical interface (in the case of the `show interfaces terse` command, the Admin and Link states) are not displayed. The system-generated logical interface `at-0/0/0.32767` is not reported at all.

- The following example shows how you can move from the context of the logical system `ls1` back to the context of the main router:

```
user@host:ls1> clear cli logical-system

Cleared default logical system

user@host>
```

For more logical system configuration examples, including verification of proper operation and verification performed by logical system administrators, see the *JUNOS Feature Guide*.

Services Interfaces

Services interfaces provide specific capabilities for manipulating traffic before it is delivered to its destination.



NOTE: On M-series and T-series routing platforms, services interfaces are installed on PICs. On the J-series routing platform, services interfaces are software-based.

Services interfaces are described in the following sections:

- M-series and T-series Services Interfaces on page 20
- J-series Services Interfaces on page 22

M-series and T-series Services Interfaces

Table 12 on page 20 lists the services interfaces that are supported on M-series and T-series routing platforms.

Table 12: M-series and T-series Services Interfaces

| Interface | Syntax | PIC |
|-------------------|------------------------------|---------------------------------|
| Adaptive services | <code>sp-fpc/pic/port</code> | Adaptive Services MultiServices |

Table 12: M-series and T-series Services Interfaces *(continued)*

| Interface | Syntax | PIC |
|-------------------------------------|-------------------------|-------------------|
| Generic routing encapsulation (GRE) | <i>gr-fpc/pic/port</i> | Adaptive Services |
| | | Link Services |
| | | MultiServices |
| | | Tunnel Services |
| IP-over-IP encapsulation tunnel | <i>ip-fpc/pic/port</i> | Adaptive Services |
| | | Link Services |
| | | MultiServices |
| | | Tunnel Services |
| Link services | <i>ls-fpc/pic/port</i> | Link Services |
| Link services IQ | <i>lsq-fpc/pic/port</i> | Adaptive Services |
| | | MultiServices |
| Logical tunnel | <i>lt-fpc/pic/port</i> | Adaptive Services |
| | | Link Services |
| | | MultiServices |
| | | Tunnel Services |
| Multicast tunnel | <i>mt-fpc/pic/port</i> | Adaptive Services |
| | | Link Services |
| | | MultiServices |
| | | Tunnel Services |
| PIM de-encapsulation | <i>pd-fpc/pic/port</i> | Adaptive Services |
| | | Link Services |
| | | MultiServices |
| | | Tunnel Services |
| PIM encapsulation | <i>pe-fpc/pic/port</i> | Adaptive Services |
| | | Link Services |
| | | MultiServices |
| | | Tunnel Services |

Table 12: M-series and T-series Services Interfaces (*continued*)

| Interface | Syntax | PIC |
|-----------------------------|--------------------------|--|
| Encryption | <i>es-fpc/pic/port</i> | ES |
| Dynamic flow capture | <i>dfc-fpc/pic/port</i> | Monitoring Services III |
| Flow collector | <i>cp-fpc/pic/port</i> | Monitoring Services II |
| Flow monitoring | <i>mo-fpc/pic/port</i> | Monitoring Services Monitoring Services II |
| Multilink services | <i>ml-fpc/pic/port</i> | Multilink Services |
| Redundant adaptive services | <i>rsp-fpc/pic/port</i> | Adaptive Services MultiServices |
| Redundant link services | <i>rlsq-fpc/pic/port</i> | Adaptive Services MultiServices |
| Virtual loopback tunnel | <i>vt-fpc/pic/port</i> | Adaptive Services Link Services MultiServices Tunnel Services |

J-series Services Interfaces

Table 13 on page 22 lists the services interfaces that are supported on the J-series routing platform.

Table 13: J-series Routing Platform Services Interfaces

| Interface | Syntax |
|---------------------------------|----------------------|
| Adaptive services | <i>sp-pim/0/port</i> |
| GRE | <i>gr-pim/0/port</i> |
| IP-over-IP encapsulation tunnel | <i>ip-pim/0/port</i> |
| Link services | <i>ls-pim/0/port</i> |
| Logical tunnel | <i>lt-pim/0/port</i> |
| Multicast tunnel | <i>mt-pim/0/port</i> |
| PIM de-encapsulation | <i>pd-pim/0/port</i> |

Table 13: J-series Routing Platform Services Interfaces (*continued*)

| Interface | Syntax |
|-------------------|----------------------|
| PIM encapsulation | <i>pe-pim/0/port</i> |

Container Interfaces

The container interface allows routing protocols to run on the logical interfaces associated with a virtual *container interface* instead of the physical SONET interfaces. For more information about container interfaces, see the *JUNOS Network Interfaces Configuration Guide*.

Table 14: Container Interfaces

| Interface | Syntax |
|---------------------|----------------------------|
| Container Interface | <i>ci < number ></i> |

Chapter 2

Common Interface Commands

Table 15 on page 25 summarizes common `clear interfaces` and `show interfaces` commands used to monitor and troubleshoot most interface types. Commands are listed in alphabetical order.

Table 15: Common Interface Commands

| Task | Command |
|--|--|
| Clear the channel service unit (CSU) alarm and defect counters. | <code>clear interfaces interval</code> |
| Clear interface statistics to zero. | <code>clear interfaces statistics</code> |
| Display brief information about all configured interfaces. | <code>show interfaces brief</code> |
| Display interface descriptions. | <code>show interfaces descriptions</code> |
| Display interfaces grouped by destination class. | <code>show interfaces destination-class</code> |
| Display detailed information about all configured interfaces. | <code>show interfaces detail</code> |
| Display extensive information about all configured interfaces. | <code>show interfaces extensive</code> |
| Display all firewall filters that are installed on each interface. | <code>show interfaces filters</code> |
| Display CSU interface alarm and error counts for the past 24 hours. | <code>show interfaces interval</code> |
| Display media-specific information about all configured network interfaces. | <code>show interfaces media</code> |
| Display all firewall policers that are installed on each interface. | <code>show interfaces policers</code> |
| Display class-of-service (CoS) information per physical interface. | <code>show interfaces queue</code> |
| Display the routing protocol process view of the router's interfaces status. | <code>show interfaces routing</code> |

Table 15: Common Interface Commands (*continued*)

| Task | Command |
|---|--|
| Display a summary of the routing protocol process view of the router's interfaces status. | <code>show interfaces routing summary</code> |
| Display information about the SNMP index of an interface. | <code>show interfaces snmp-index</code> |
| Display information about interfaces grouped by source class. | <code>show interfaces source-class</code> |
| Display static interface statistics, such as errors. | <code>show interfaces statistics</code> |
| Display summary information about interfaces. | <code>show interfaces terse</code> |



NOTE: For information about the `monitor interface` and `monitor traffic` commands, see the *JUNOS System Basics and Services Command Reference*. For information about the `show interfaces controller` command, see the channelized interfaces chapters in this reference.

clear interfaces interval

| | |
|---------------------------------|---|
| Syntax | <code>clear interfaces interval <i>interface-name</i></code> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Clear the channel service unit (CSU) alarm and defect counters so that only the current time interval is displayed. This operation affects the <code>show interface interval</code> command, but not an SNMP query. |
| Options | <i>interface-name</i> —Name of a particular interface. |
| Required Privilege Level | clear |
| Related Topics | <code>show interfaces interval</code> |
| List of Sample Output | <code>clear interfaces interval</code> on page 27 |
| Output Fields | See <code>show interfaces interval</code> for an explanation of output fields. |

clear interfaces interval The following example displays the output for a T3 interface before and after the `clear interfaces` command is entered:

```
user@host> show interfaces interval t3-0/3/0:4
Physical interface: t3-0/3/0:4, SNMP ifIndex: 23
  17:43-current:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  17:28-17:43:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  17:13-17:28:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:58-17:13:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:43-16:58:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:28-16:43:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    CES: 195, CSES: 195, SEFS: 195, UAS: 206
  14:58-15:13:
    LCV: 35, PCV: 163394, CCV: 54485, LES: 0, PES: 35, PSES: 35, CES:
    35, CSES: 35, SEFS: 35, UAS: 32
Interval Total:
  LCV: 230, PCV: 1145859, CCV: 455470, LES: 0, PES: 230, PSES: 230,
  CES: 230, CSES: 230, SEFS: 230, UAS: 238
user@host> clear interfaces interval t3-0/3/0:4
```

```
user@host> show interfaces interval t3-0/3/0:4
Physical interface: t3-0/3/0:4, SNMP ifIndex: 23
  17:43-current:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  Interval Total:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0, SEFS: 0,
    UAS: 0
```


clear interfaces statistics

| | |
|------------------------------------|---|
| Syntax | clear interfaces statistics (all <i>interface-name</i>) |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Set interface statistics to zero. If you issue the clear interfaces statistics <i>interface-name</i> command and then perform a graceful Routing Engine switchover, the interface statistics are not cleared on the new master. Reissue the command to clear the interface statistics again. |
| Options | <p>all—Set statistics on all interfaces to zero.</p> <p><i>interface-name</i>—Set statistics on a particular interface to zero.</p> |
| Required Privilege Level | clear |
| List of Sample Output | clear interfaces statistics on page 29 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear interfaces statistics | user@host> clear interfaces statistics |

clear interfaces interface-set statistics

| | |
|--|---|
| Syntax | clear interfaces interface-set statistics <i>interface-set-name</i> |
| Release Information | Command introduced in JUNOS Release 8.5. |
| Description | Set interface set statistics to zero. |
| Options | <i>interface-set-name</i> —Set statistics on a specified interface set to zero. Wildcard values can be used in the interface set name. This command will not clear the statistics of the member logical interfaces. |
| Required Privilege Level | clear |
| List of Sample Output | clear interfaces interface-set statistics on page 30 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear interfaces interface-set statistics | user@host> clear interfaces interface-set statistics |

show interfaces brief

| | |
|---------------------------------|--|
| Syntax | show interfaces brief |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display brief information about all interfaces configured on the router. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces brief on page 31 show interfaces brief (Encryption) on page 32 show interfaces brief (Gigabit Ethernet) on page 32 |
| Output Fields | For a description of output fields for specific interfaces, see the other chapters in this manual. |

```

show interfaces brief
user@host> show interfaces brief
Physical interface: so-1/2/0, Enabled, Physical link is Down
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC48,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running Down
  Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives
  SONET alarms   : LOL, LOS
  SONET defects  : LOL, LOF, LOS, SEF, AIS-L, AIS-P
Physical interface: at-1/3/0, Enabled, Physical link is Up
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
  Speed: OC12, Loopback: None, Payload scrambler: Enabled
  Device flags   : Present Running
  Link flags     : None
Physical interface: at-1/3/1, Enabled, Physical link is Up
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
  Speed: OC12, Loopback: None, Payload scrambler: Enabled
  Device flags   : Present Running
  Link flags     : None
Physical interface: so-2/0/0, Enabled, Physical link is Up
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC48,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 1978 (00:00:08 ago), Output: 1999 (00:00:03 ago)
  SONET alarms   : None
  SONET defects  : None
Logical interface so-2/0/0.0
  Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
  soagg
...

```

```

show interfaces brief   user@host> show interfaces brief es-0/2/0
(Encryption)          Physical interface: es-0/2/0, Enabled, Physical link is Up
                          Type: IPSEC, Link-level type: IPSEC-over-IP, MTU: 3900, Speed: 800mbps
                          Device flags   : Present Running
                          Interface flags: Point-To-Point SNMP-Traps

show interfaces brief   user@host> show interfaces brief ge-3/0/2
(Gigabit Ethernet)     Physical interface: ge-3/0/2, Enabled, Physical link is Up
                          Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, Loopback: Disabled,
                          Source filtering: Disabled, Flow control: Enabled
                          Device flags   : Present Running
                          Interface flags: SNMP-Traps 16384
                          Link flags     : None
                          Logical interface ge-3/0/2.0
                          Flags: SNMP-Traps Encapsulation: ENET2
                          aenet

```

show interfaces descriptions

| | |
|--------------------------|---|
| Syntax | show interfaces descriptions |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display the interface descriptions that have been configured with the description statement at one of the following hierarchy levels: <ul style="list-style-type: none">■ [edit interfaces <i>interface-name</i>]■ [edit interfaces <i>interface-name</i> unit <i>unit-number</i>]■ [edit logical-system <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>unit-number</i>] |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces descriptions on page 33 |
| Output Fields | Table 16 on page 33 lists the output fields for the show interfaces description command. Output fields are listed in the approximate order in which they appear. |

Table 16: show interfaces descriptions Output Fields

| Field Name | Field Description |
|-------------|---|
| Interface | Name of the interface. |
| Link | Link state: up or down. |
| Admin | Interface status: up or down. |
| Description | Configured description for the interface. |

| | |
|------------------------------|---|
| show interfaces descriptions | user@host> show interfaces descriptions |
| | Interface Admin Link Description |
| | so-1/0/0 up up M20-3#1 |
| | so-2/0/0 up up GSR-12#1 |
| | ge-3/0/0 up up SMB-OSPF_Area300 |
| | so-3/3/0 up up GSR-13#1 |
| | so-3/3/1 up up GSR-13#2 |
| | ge-4/0/0 up up T320-7#1 |
| | ge-5/0/0 up up T320-7#2 |
| | so-7/1/0 up up M160-6#1 |
| | ge-8/0/0 up up T320-7#3 |
| | ge-9/0/0 up up T320-7#4 |
| | so-10/0/0 up up M160-6#2 |
| | so-13/0/0 up up M20-3#2 |
| | so-14/0/0 up up GSR-12#2 |
| | ge-15/0/0 up up SMB-OSPF_Area100 |
| | ge-15/0/1 up up GSR-13#3 |

show interfaces destination-class

| | |
|---------------------------------|---|
| Syntax | show interfaces destination-class (all <i>destination-class-name logical-interface-name</i>) |
| Release Information | Command introduced before JUNOS Release 7.4. all option introduced in JUNOS Release 8.0. |
| Description | Display information about interfaces grouped by destination class. |
| Options | all—Display information about all configured destination classes. <i>destination-class-name</i> —Name of a logical grouping of prefixes that count packets having the destination address matching those prefixes. Whenever a destination class is specified, you must also specify a particular logical interface, not all interfaces. <i>logical interface-name</i> —Name of a logical interface. |
| Additional Information | For interfaces that carry IPv4, IPv6, or Multiprotocol Label Switching (MPLS) traffic, you can maintain packet counts based on the entry and exit points for traffic passing through your network. Entry and exit points are identified by source and destination prefixes grouped into sets defined as source classes and destination classes. For more information, see the <i>JUNOS Network Interfaces Configuration Guide</i> . |
| Required Privilege Level | view |
| List of Sample Output | show interfaces destination-class all on page 35 |
| Output Fields | Table 17 on page 34 lists the output fields for the show interfaces destination-class command. Output fields are listed in the approximate order in which they appear. |

Table 17: show interfaces destination-class Output Fields

| Field Name | Field Description |
|-------------------|--|
| Logical interface | Name of the logical interface. |
| Destination class | Name of destination class usage (DCU) counters per class for this interface. |
| Packets | Packets going to designated user-selected prefixes. |
| Bytes | Bytes going to designated user-selected prefixes. |

```
show interfaces user@host> show interfaces destination-class all
destination-class all Logical interface so-4/0/0.0
                        Destination class      Packets      Bytes
                        (packet-per-second)    (bits-per-second)
                        gold                    0              0
                        (                    0) (              0)
                        silver                  0              0
                        (                    0) (              0)
Logical interface so-0/1/3.0
                        Destination class      Packets      Bytes
                        (packet-per-second)    (bits-per-second)
                        gold                    0              0
                        (                    0) (              0)
                        silver                  0              0
                        (                    0) (              0)
```

show interfaces detail

| | |
|---------------------------------|---|
| Syntax | show interfaces detail |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display detailed information about all interfaces configured on the router. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces detail (SONET) on page 36 |
| Output Fields | For more information, see the output fields table for the particular interface type in which you are interested. For information about destination class and source class statistics, see “Destination Class Field” on page 87 and “Source Class Field” on page 93, respectively. For sample output for specific interfaces, see the other chapters in this manual. |

```

user@host> show interfaces so-1/1/0 detail
Physical interface: so-1/1/0, Enabled, Physical link is Up
  Interface index: 142, SNMP ifIndex: 47, Generation: 143
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC12,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Hold-times    : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 1934 (last seen 17:35:39 ago)
    Output: 1927 (last sent 17:35:48 ago)
  LCP state: Down
  NCP state: inet: Down, inet6: Not-configured, iso: Down, mp1s: Not-configured
  CHAP state: Closed
  CoS queues   : 4 supported, 4 maximum usable queues
  Last flapped : 2006-04-19 15:22:33 PDT (05:25:55 ago)
  Statistics last cleared: 2006-04-18 03:58:02 PDT (1d 16:50 ago)
  Traffic statistics:
    Input bytes   :                7910882                0 bps
    Output bytes  :                5632131                0 bps
    Input packets :                89460                0 pps
    Output packets:                116043                0 pps
  SONET alarms   : None
  SONET defects  : None
Logical interface so-1/1/0.0 (Index 69) (SNMP ifIndex 61) (Generation 138)
  Flags: Hardware-Down Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  Protocol inet, MTU: 4470, Generation: 156, Route table: 2
  Flags: Protocol-Down, SCU-out

```



```
Source class          Packets          Bytes
                     (packet-per-second) (bits-per-second)
gold1                 0                0
                     ( 0) ( 0)
gold2                 0                0
                     ( 0) ( 0)
gold3                 0                0
                     ( 0) ( 0)
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 10.27.248/24, Local: 10.27.248.1, Broadcast: 10.27.248.255,

Generation: 152
Protocol iso, MTU: 4470, Generation: 157, Route table: 2
Flags: Protocol-Down, Is-Primary
```

show interfaces extensive

| | |
|--|--|
| Syntax | show interfaces extensive |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display extensive information about all interfaces configured on the router. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Fast Ethernet) on page 38 |
| Output Fields | For more information, see the output fields table for the particular interface type in which you are interested. For information about destination class and source class statistics, see “Destination Class Field” on page 87 and “Source Class Field” on page 93, respectively. For sample output for specific interfaces, see the other chapters in this manual. |
| show interfaces extensive (Fast Ethernet) | <pre> user@host> show interfaces fe-0/2/1 extensive Physical interface: fe-0/2/0, Enabled, Physical link is Up Interface index: 129, SNMP ifIndex: 23, Generation: 130 Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled, Source filtering: Disabled, Flow control: Enabled Device flags : Present Running Interface flags: SNMP-Traps Internal: 0x4000 CoS queues : 4 supported, 4 maximum usable queues Hold-times : Up 0 ms, Down 0 ms Current address: 00:90:69:91:c4:3e, Hardware address: 00:90:69:91:c4:3e Last flapped : 2006-04-16 23:00:41 PDT (02:08:05 ago) Statistics last cleared: 2006-04-16 21:42:00 PDT (03:26:46 ago) Traffic statistics: Input bytes : 17539 152 bps Output bytes : 92968 224 bps Input packets: 348 0 pps Output packets: 1349 0 pps Input errors: Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0 Output errors: Carrier transitions: 3, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0, FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0 Egress queues: 4 supported, 4 in use Queue counters: Queued packets Transmitted packets Dropped packets 0 best-effort 66 66 0 1 expedited-fo 0 0 0 2 assured-forw 0 0 0 3 network-cont 1283 1283 0 Active alarms : None </pre> |

Active defects : None

| | | |
|--------------------|---------|----------|
| MAC statistics: | Receive | Transmit |
| Total octets | 24721 | 105982 |
| Total packets | 348 | 1349 |
| Unicast packets | 347 | 430 |
| Broadcast packets | 1 | 37 |
| Multicast packets | 0 | 882 |
| CRC/Align errors | 0 | 0 |
| FIFO errors | 0 | 0 |
| MAC control frames | 0 | 0 |
| MAC pause frames | 0 | 0 |
| Oversized frames | 0 | |
| Jabber frames | 0 | |
| Fragment frames | 0 | |
| VLAN tagged frames | 0 | |
| Code violations | 0 | |

| | | |
|---------------------------|-----|------|
| Filter statistics: | | |
| Input packet count | 348 | |
| Input packet rejects | 0 | |
| Input DA rejects | 0 | |
| Input SA rejects | 0 | |
| Output packet count | | 1349 |
| Output packet pad count | | 0 |
| Output packet error count | | 0 |

CAM destination filters: 3, CAM source filters: 0

Autonegotiation information:

Negotiation status: Complete

Link partner:

Link mode: Full-duplex, Flow control: None, Remote fault: OK

Packet Forwarding Engine configuration:

Destination slot: 0

| CoS transmit queue | Bandwidth | Buffer | Priority | Limit |
|--------------------|-------------|--------|----------|-------|
| | % bps | % usec | | |
| 0 best-effort | 95 95000000 | 95 0 | low | none |
| 3 network-control | 5 5000000 | 5 0 | low | none |

Logical interface fe-0/2/0.0 (Index 66) (SNMP ifIndex 46) (Generation 133)

Flags: SNMP-Traps Encapsulation: ENET2

Protocol inet, MTU: 1500, Generation: 142, Route table: 0

Flags: DCU, SCU-out

| Destination class | Packets (packet-per-second) | Bytes (bits-per-second) |
|-------------------|--------------------------------|----------------------------|
| silv1_new | 0 | 0 |
| (| 0) | 0) |
| silv2_new | 0 | 0 |
| (| 0) | 0) |
| silv_misc | 0 | 0 |
| (| 0) | 0) |
| silver0 | 0 | 0 |
| (| 0) | 0) |
| silver2 | 0 | 0 |
| (| 0) | 0) |
| silver3 | 0 | 0 |
| (| 0) | 0) |
| silver4 | 0 | 0 |
| (| 0) | 0) |
| silver5 | 0 | 0 |
| (| 0) | 0) |
| silver6 | 0 | 0 |
| (| 0) | 0) |
| silver7 | 0 | 0 |

```

                                (          0) (          0)
silver9                        0          0
                                (          0) (          0)
Source class                    Packets      Bytes
                                (packet-per-second) (bits-per-second)
gold1                          0          0
                                (          0) (          0)
gold2                          16600      1062400
                                (          0) (          0)
gold3                          0          0
                                (          0) (          0)
Addresses, Flags: Is-Preferred Is-Primary
Destination: 12.1.1/24, Local: 12.1.1.1, Broadcast: 12.1.1.255,
Generation: 150

```

show interfaces filters

| | |
|--------------------------|---|
| Syntax | show interfaces filters <interface-name> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display all firewall filters that are installed on each interface in a system. |
| Options | none—Display filter information about all interfaces. interface-name—(Optional) Display filter information about a particular interface. |
| Additional Information | For information about how to configure firewall filters, see the <i>JUNOS Policy Framework Configuration Guide</i> . For related operational mode commands, see the <i>JUNOS Routing Protocols and Policies Command Reference</i> . |
| Required Privilege Level | view |
| List of Sample Output | show interfaces filters on page 42 show interfaces filters interface-name on page 42 |
| Output Fields | Table 18 on page 41 lists the output fields for the show interfaces filters command. Output fields are listed in the approximate order in which they appear. |

Table 18: show interfaces filters Output Fields

| Field Name | Field Description |
|---------------|--|
| Interface | Name of the interface. |
| Admin | Interface state: up or down. |
| Link | Link state: up or down. |
| Proto | Protocol configured on the interface. |
| Input Filter | Names of any firewall filters to be evaluated when packets are received on the interface, including any filters attached through activation of dynamic service. |
| Output Filter | Names of any firewall filters to be evaluated when packets are transmitted on the interface, including any filters attached through activation of dynamic service. |

```

show interfaces filters user@host> show interfaces filters
Interface      Admin Link Proto Input Filter      Output Filter
ge-0/0/0       up    up
ge-0/0/0.0     up    up    inet
               iso
gr-0/3/0       up    up
ip-0/3/0       up    up
mt-0/3/0       up    up
pd-0/3/0       up    up
pe-0/3/0       up    up
vt-0/3/0       up    up
at-1/0/0       up    up
at-1/0/0.0     up    up    inet
               iso
at-1/1/0       up    down
at-1/1/0.0     up    down inet
               iso
....

show interfaces filters user@host> show interfaces filters so-2/1/0
interface-name Interface      Admin Link Proto Input Filter      Output Filter
so-2/1/0       up    down
so-2/1/0.0     up    down inet    goop      outfilter
               iso
               inet6 v6in      v6out

user@host > show interfaces filters ge-3/0/1
Interface      Admin Link Proto Input Filter      Output Filter
ge-3/0/1       up    up
ge-3/0/1.0     up    up    inet    F1-ge-3/0/1.0-in    F2-ge-3/0/1.0-out
               inet    F3-ge-3/0/1.0-in

```

show interfaces interval

| | |
|---------------------------------|---|
| Syntax | show interfaces interval <interface-name> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display the channel service unit (CSU) interface alarm and error count in 15-minute intervals for the past 24 hours. If the system has been operational for less than 24 hours, the maximum number of intervals available is displayed. |
| Options | <i>interface-name</i> —Name of a particular interface. |
| Required Privilege Level | view |
| Related Topics | clear interfaces interval |
| List of Sample Output | show interfaces interval (Channelized OC12) on page 44 show interfaces interval (E3) on page 44 show interfaces interval (SONET/SDH) on page 44 |
| Output Fields | Table 19 on page 43 lists the output fields for the show interfaces interval command. Output fields are listed in the approximate order in which they appear. |

Table 19: show interfaces interval Output Fields

| Field Name | Field Description |
|--------------------|---|
| Physical interface | Name of the interface. |
| SNMP ifIndex | SNMP index number for the physical interface. |
| hh:mm-current | Time of day (in hours and minutes) at the beginning of the latest counter interval. The value of the latest counter interval is always less than 15 minutes. |
| hh:mm-hh:mm | Time of day (in hours and minutes) at the beginning and end of each 15-minute interval. |
| alarm or event: n | Count of alarms and events within each 15-minute interval. The specific alarm or event depends on the interface media type. For a description of the alarm or event listed, see the <i>interface-type media</i> field (for example, T1 media) under the show interfaces command for the particular interface type in which you are interested. |
| Interval Total | Sum of all the alarm and defect counters for the last 24-hour period. |

**show interfaces interval
(Channelized OC12)**

```

user@host> show interfaces interval t3-0/3/0:0
Physical interface: t3-0/3/0:0, SNMP ifIndex: 23
17:43-current:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
17:28-17:43:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
17:13-17:28:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
16:58-17:13:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
16:43-16:58:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  ...
Interval Total:
  LCV: 230, PCV: 1145859, CCV: 455470, LES: 0, PES: 230, PSES: 230,
  CES: 230, CSES: 230, SEFS: 230, UAS: 238

```

**show interfaces interval
(E3)**

```

user@host> show interfaces interval e3-0/3/0
Physical interface: e3-0/3/0, SNMP ifIndex: 23
17:43-current:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
17:28-17:43:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
17:13-17:28:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
16:58-17:13:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  SEFS: 0, UAS: 0
16:43-16:58:
  LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
  ....
Interval Total:
  LCV: 230, PCV: 1145859, CCV: 455470, LES: 0, PES: 230, PSES: 230,
  CES: 230, CSES: 230, SEFS: 230, UAS: 238

```

**show interfaces interval
(SONET/SDH)**

```

user@host> show interfaces interval so-0/1/0
Physical interface: so-0/1/0, SNMP ifIndex: 19
20:02-current:
  ES-S: 0, SES-S: 0, SEFS-S: 0, ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0,
  SES-P: 0, UAS-P: 0
19:47-20:02:
  ES-S: 267, SES-S: 267, SEFS-S: 267, ES-L: 267, SES-L: 267, UAS-L: 267,
  ES-P: 267, SES-P: 267, UAS-P: 267
19:32-19:47:
  ES-S: 56, SES-S: 56, SEFS-S: 56, ES-L: 56, SES-L: 56, UAS-L: 46, ES-P: 56,
  SES-P: 56, UAS-P: 46
19:17-19:32:
  ES-S: 0, SES-S: 0, SEFS-S: 0, ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0,
  SES-P: 0, UAS-P: 0
19:02-19:17:
  .....

```


show interfaces media

| | |
|--|--|
| Syntax | show interfaces media |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display media-specific information about all configured network interfaces. |
| Options | This command has no options. |
| Additional Information | Output from both the show interfaces <i>interface-name</i> detail and the show interfaces <i>interface-name</i> extensive commands includes all the information displayed in the output from the show interfaces media command. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces media (SONET/SDH) on page 45 |
| Output Fields | <p>The output from the show interfaces media command includes fields that display interface media-specific information. These fields are also included in the show interfaces <i>interface-name</i> command for each particular interface type, and the information provided in the fields is unique to each interface type.</p> <p>One field unique to the show interfaces media command is interface-type errors (for example, SONET errors). This field appears for channelized E3, channelized T3, channelized OC, E1, E3, SONET, T1, and T3 interfaces. The information provided in this output field is also provided in the output from the show interfaces <i>interface-name</i> command. (For example, for SONET interfaces, these fields are SONET section, SONET line, and SONET path). For a description of errors, see the chapter with the particular interface type in which you are interested.</p> |
| show interfaces media (SONET/SDH) | <p>The following example displays the output fields unique to the show interfaces media command for a SONET interface (with no level of output specified):</p> |

```

user@host> show interfaces media so-4/1/2
Physical interface: so-4/1/2, Enabled, Physical link is Up
  Interface index: 168, SNMP ifIndex: 495
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC48,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 1783 (00:00:00 ago), Output: 1786 (00:00:08 ago)
  LCP state: Opened
  NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Not-configured
  CoS queues   : 8 supported
  Last flapped : 2005-06-15 12:14:59 PDT (04:31:29 ago)
  Input rate    : 0 bps (0 pps)
  Output rate   : 0 bps (0 pps)
  SONET alarms  : None
  SONET defects : None
  SONET errors:

```

```
BIP-B1: 121, BIP-B2: 916, REI-L: 0, BIP-B3: 137, REI-P: 16747, BIP-BIP2: 0
Received path trace: routerb so-1/1/2
Transmitted path trace: routera so-4/1/2
```

show interfaces policers

| | |
|--------------------------|---|
| Syntax | show interfaces policers <interface-name> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display all policers that are installed on each interface in a system. |
| Options | none—Display policer information about all interfaces. interface-name—(Optional) Display filter information about a particular interface. |
| Additional Information | For information about how to configure policers, see the <i>JUNOS Policy Framework Configuration Guide</i> . For related operational mode commands, see the <i>JUNOS Routing Protocols and Policies Command Reference</i> . |
| Required Privilege Level | view |
| List of Sample Output | show interfaces policers on page 48 show interfaces policers interface-name on page 48 |
| Output Fields | Table 20 on page 47 lists the output fields for the show interfaces policers command. Output fields are listed in the approximate order in which they appear. |

Table 20: show interfaces policers Output Fields

| Field Name | Field Description |
|----------------|--|
| Interface | Name of the interface. |
| Admin | Interface state: up or down. |
| Link | Link state: up or down. |
| Proto | Protocol configured on the interface. |
| Input Policer | Policer to be evaluated when packets are received on the interface. It has the format <i>interface-name-in-policer</i> . |
| Output Policer | Policer to be evaluated when packets are transmitted on the interface. It has the format <i>interface-name-out-policer</i> . |

```

show interfaces policers user@host> show interfaces policers
Interface      Admin Link Proto Input Policer      Output Policer
ge-0/0/0       up    up
ge-0/0/0.0     up    up  inet
               up    up    iso

gr-0/3/0       up    up
ip-0/3/0       up    up
mt-0/3/0       up    up
pd-0/3/0       up    up
pe-0/3/0       up    up
...
so-2/0/0       up    up
so-2/0/0.0     up    up  inet  so-2/0/0.0-in-policer  so-2/0/0.0-out-policer
               up    up    iso
so-2/1/0       up    down
...

show interfaces policers user@host> show interfaces policers so-2/1/0
interface-name Interface      Admin Link Proto Input Policer      Output Policer
so-2/1/0       up    down
so-2/1/0.0     up    down  inet  so-2/1/0.0-in-policer  so-2/1/0.0-out-policer
               up    down    iso
               up    down    inet6

```

show interfaces queue

| | |
|-------------------------------|---|
| Syntax | <pre>show interfaces queue <aggregate remaining-traffic> <both-ingress-egress> <egress> <forwarding-class forwarding-class> <ingress> <interface-name interface-name> <remaining-traffic></pre> |
| Release Information | <p>Command introduced before JUNOS Release 7.4.</p> <p><code>both-ingress-egress</code>, <code>egress</code>, and <code>ingress</code> options introduced in JUNOS Release 7.6.</p> |
| Description | Display class-of-service (CoS) queue information for physical interfaces. |
| Options | <p><code>none</code>—Show detailed CoS queue statistics for all physical interfaces.</p> <p><code>aggregate</code>—(Optional) Display the aggregated queuing statistics of all logical interfaces that have traffic-control profiles configured.</p> <p><code>both-ingress-egress</code>—(Optional) On Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs, display both ingress and egress queue statistics.</p> <p><code>egress</code>—(Optional) Display egress queue statistics.</p> <p><code>forwarding-class forwarding-class</code>—(Optional) Forwarding class name for this queue. Shows detailed CoS statistics for the queue associated with the specified forwarding class.</p> <p><code>ingress</code>—(Optional) On Gigabit Ethernet IQ2 PICs, display ingress queue statistics.</p> <p><code>interface-name interface-name</code>—(Optional) Show detailed CoS queue statistics for the specified interface.</p> <p><code>remaining-traffic</code>—(Optional) Display the queuing statistics of all logical interfaces that do not have traffic-control profiles configured.</p> |
| Additional Information | <p>On the M-series routing platform (except for the M320 and M120 routers), this command is valid only for a PIC installed on an enhanced Flexible PIC Concentrator (FPC).</p> <p>Queue statistics for aggregated interfaces are supported on the M-series and T-series routing platforms only. Statistics for an aggregated interface are the summation of the queue statistics of the child links of that aggregated interface. You can view the statistics for a child interface by using the <code>show interfaces statistics</code> command for that child interface.</p> <p>When you configure tricolor marking on a 10-port 1-Gigabit Ethernet PIC, for queues 6 and 7 only, the output does not display the number of queued bytes and packets, or the number of bytes and packets dropped because of RED. If you do not configure tricolor marking on the interface, these statistics are available for all queues.</p> |

For Gigabit Ethernet IQ2 PICs, the **show interfaces queue** command output does not display the number of tail-dropped packets. This limitation does not apply to Forwarding Engine chassis queues.

When fragmentation occurs on the egress interface, the first set of packet counters shows the postfragmentation values. The second set of packet counters (under the **Packet Forwarding Engine Chassis Queues** field) shows the prefragmentation values.

For information about how to configure CoS, see the *JUNOS Network Interfaces Configuration Guide*. For related CoS operational mode commands, see the *JUNOS System Basics and Services Command Reference*.

Required Privilege Level view

List of Sample Output show interfaces queue (Aggregated Ethernet on a T320 Router) on page 54
 show interfaces queue (Fast Ethernet on a J4300 Router) on page 55
 show interfaces queue (Gigabit Ethernet on a T640 Router) on page 56
 show interfaces queue aggregate (Gigabit Ethernet Enhanced DPC) on page 57
 show interfaces queue (Gigabit Ethernet IQ2) on page 60
 show interfaces queue both-ingress-egress (Gigabit Ethernet IQ2) on page 63
 show interfaces queue ingress (Gigabit Ethernet IQ2) on page 65
 show interfaces queue egress (Gigabit Ethernet IQ2) on page 66
 show interfaces queue remaining-traffic (Gigabit Ethernet Enhanced DPC) on page 67

Output Fields Table 21 on page 50 lists the output fields for the **show interfaces queue** command. Output fields are listed in the approximate order in which they appear.

Table 21: show interfaces queue Output Fields

| Field Name | Field Description |
|------------------------------|---|
| Physical interface | Name of the physical interface. |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. |
| Interface index | Physical interface's index number, which reflects its initialization sequence. |
| SNMP ifIndex | SNMP index number for the interface. |
| Forwarding classes supported | Total number of forwarding classes supported on the specified interface. |
| Forwarding classes in use | Total number of forwarding classes in use on the specified interface. |
| Ingress queues supported | On Gigabit Ethernet IQ2 PICs only, total number of ingress queues supported on the specified interface. |
| Ingress queues in use | On Gigabit Ethernet IQ2 PICs only, total number of ingress queues in use on the specified interface. |
| Output queues supported | Total number of output queues supported on the specified interface. |
| Output queues in use | Total number of output queues in use on the specified interface. |

Table 21: show interfaces queue Output Fields (continued)

| Field Name | Field Description |
|--------------------------|--|
| Egress queues supported | Total number of egress queues supported on the specified interface. |
| Egress queues in use | Total number of egress queues in use on the specified interface. |
| Queue | Queue number. |
| Ingress queues in use | Total number of ingress queues supported on the specified interface. Displayed on IQ2 interfaces. |
| Queue counters (Ingress) | CoS queue number and its associated user-configured forwarding class name. Displayed on IQ2 interfaces. <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. |
| Burst size | (Logical interfaces on IQ PICs only) Maximum number of bytes up to which the logical interface can burst. The burst size is based on the shaping rate applied to the interface. |
| Forwarding classes | Forwarding class name. |
| Queued Packets | Number of packets queued to this queue. <p>NOTE: For Gigabit Ethernet IQ2 interfaces, the Queued Packets count is calculated by the JUNOS software assuming that one frame buffer represents one packet. If the queued packets are very large or very small, the calculation might not be completely accurate for transit traffic. The count is completely accurate for traffic terminated on the router.</p> |
| Queued Bytes | Number of bytes queued to this queue. The byte counts vary by PIC type. For more information, see Table 22 on page 53. |
| Transmitted Packets | Number of packets transmitted by this queue. When fragmentation occurs on the egress interface, the first set of packet counters shows the postfragmentation values. The second set of packet counters (displayed under the Packet Forwarding Engine Chassis Queues field) shows the prefragmentation values. |
| Transmitted Bytes | Number of bytes transmitted by this queue. The byte counts vary by PIC type. For more information, see Table 22 on page 53. |
| Tail-dropped packets | Number of packets dropped because of tail drop. |

Table 21: show interfaces queue Output Fields (*continued*)

| Field Name | Field Description |
|---------------------|--|
| RED-dropped packets | <p>Number of packets dropped because of random early detection (RED).</p> <ul style="list-style-type: none"> ■ (M-series and T-series routing platforms only) On M320 and M120 routers and the T-series routing platform, the total number of dropped packets is displayed. On all other M-series routers, the output classifies dropped packets into the following categories: <ul style="list-style-type: none"> ■ Low, non-TCP—Number of low-loss priority non-TCP packets dropped because of RED. ■ Low, TCP—Number of low-loss priority TCP packets dropped because of RED. ■ High, non-TCP—Number of high-loss priority non-TCP packets dropped because of RED. ■ High, TCP—Number of high-loss priority TCP packets dropped because of RED. ■ (J-series routing platform and MX-series routers with enhanced DPCs only) The output classifies dropped packets into the following categories: <ul style="list-style-type: none"> ■ Low—Number of low-loss priority packets dropped because of RED. ■ Medium-low—Number of medium-low loss priority packets dropped because of RED. ■ Medium-high—Number of medium-high loss priority packets dropped because of RED. ■ High—Number of high-loss priority packets dropped because of RED. |
| RED-dropped bytes | <p>Number of bytes dropped because of RED. The byte counts vary by PIC type. For more information, see Table 22 on page 53.</p> <ul style="list-style-type: none"> ■ (M-series and T-series routing platforms only) On M320 and M120 routers and the T-series routing platform, only the total number of dropped bytes is displayed. On all other M-series routers, the output classifies dropped bytes into the following categories: <ul style="list-style-type: none"> ■ Low, non-TCP—Number of low-loss priority non-TCP bytes dropped because of RED. ■ Low, TCP—Number of low-loss priority TCP bytes dropped because of RED. ■ High, non-TCP—Number of high-loss priority non-TCP bytes dropped because of RED. ■ High, TCP—Number of high-loss priority TCP bytes dropped because of RED. ■ (J-series routing platform only) The output classifies dropped bytes into the following categories: <ul style="list-style-type: none"> ■ Low—Number of low-loss priority bytes dropped because of RED. ■ Medium-low—Number of medium-low loss priority bytes dropped because of RED. ■ Medium-high—Number of medium-high loss priority bytes dropped because of RED. ■ High—Number of high-loss priority bytes dropped because of RED. |

Byte counts vary by PIC type. Table 22 on page 53 shows how the byte counts on the outbound interfaces vary depending on the PIC type. Table 22 on page 53 is based on the assumption that outbound interfaces are sending IP traffic with 478 bytes per packet.

Table 22: Byte Count by PIC Type

| PIC Type | Output Level | Byte Count Includes | Comments |
|--|-----------------------------|--|---|
| Gigabit Ethernet IQ and IQE PICs | Interface | Queued: 490 bytes per packet, representing 478 bytes of Layer 3 packet + 12 bytes Transmitted: 490 bytes per packet, representing 478 bytes of Layer 3 packet + 12 bytes RED dropped: 496 bytes per packet representing 478 bytes of Layer 3 packet + 18 bytes | The 12 additional bytes include 6 bytes for the destination MAC address + 4 bytes for the VLAN + 2 bytes for the Ethernet type. For RED dropped, 6 bytes are added for the source MAC address. |
| | Packet forwarding component | Queued: 478 bytes per packet, representing 478 bytes of Layer 3 packet Transmitted: 478 bytes per packet, representing 478 bytes of Layer 3 packet | – |
| Non-IQ PIC | Interface | Queued: 478 bytes of Layer 3 packet + the full Layer 2 overhead. Transmitted: 478 bytes of Layer 3 packet + the full Layer 2 overhead. | The Layer 2 overhead is 14 bytes for non-VLAN traffic and 18 bytes for VLAN traffic. |
| IQ and IQE PICs with a SONET/SDH interface | Interface | Queued: 482 bytes per packet, representing 478 bytes of Layer 3 packet + 4 bytes Transmitted: 482 bytes per packet, representing 478 bytes of Layer 3 packet + 4 bytes RED dropped: 482 bytes per packet, representing 478 bytes of Layer 3 packet + 4 bytes | The additional 4 bytes are for the Layer 2 Point-to-Point Protocol (PPP) header. |
| | Packet forwarding component | Queued: 478 bytes per packet, representing 478 bytes of Layer 3 packet Transmitted: 486 bytes per packet, representing 478 bytes of Layer 3 packet + 8 bytes | For transmitted packets, the additional 8 bytes includes 4 bytes for the PPP header and 4 bytes for a cookie. |
| Non-IQ PIC with a SONET/SDH interface | Interface | Queued: 478 bytes per packet, representing 478 bytes of Layer 3 packet Transmitted: 483 bytes per packet, representing 478 bytes of Layer 3 packet + 5 bytes RED dropped: 478 bytes per packet, representing 478 bytes of Layer 3 packet | For transmitted packets, the additional 5 bytes includes 4 bytes for the PPP header and 1 byte for the packet loss priority (PLP). |
| 1-port 10 Gigabit Ethernet IQ2 PIC | Interface | Queued: 120 bytes of Layer 3 packet Transmitted: 148 bytes per packet, representing 120 bytes of Layer 3 packet + 28 bytes of SONET and Ethernet overhead | Calculated for LAN-PHY signal in an an OC-192 payload for an IP packet of 120 bytes. The total overhead is the LAN PHY overhead plus the SONET overhead. |

Table 22: Byte Count by PIC Type (continued)

| PIC Type | Output Level | Byte Count Includes | Comments |
|--------------------------------------|--------------|---|--|
| 1-port 10 Gigabit Ethernet IQ2-E PIC | Interface | Queued: 478 bytes of Layer 3 packet + the full Layer 2 overhead including CRC. Transmitted: 478 bytes of Layer 3 packet + the full Layer 2 overhead including CRC. | The Layer 2 overhead is 18 bytes for non-VLAN traffic and 22 bytes for VLAN traffic. |

show interfaces queue
(Aggregated Ethernet on
a T320 Router)

The following example shows that the aggregated Ethernet interface, **ae1**, has traffic on queues **af1** and **af12**:

```

user@host> show interfaces queue ae1
Physical interface: ae1, Enabled, Physical link is Up
Interface index: 158, SNMP ifIndex: 33 Forwarding classes: 8 supported, 8 in use
Output queues: 8 supported, 8 in use
Queue: 0, Forwarding classes: be
  Queued:
    Packets      :                5                0 pps
    Bytes        :               242                0 bps
  Transmitted:
    Packets      :                5                0 pps
    Bytes        :               242                0 bps
    Tail-dropped packets :                0                0 pps
    RED-dropped packets :                0                0 pps
    RED-dropped bytes  :                0                0 bps
Queue: 1, Forwarding classes: af1
  Queued:
    Packets      :           42603765           595484 pps
    Bytes        :           5453281920        609776496 bps
  Transmitted:
    Packets      :           42603765           595484 pps
    Bytes        :           5453281920        609776496 bps
    Tail-dropped packets :                0                0 pps
    RED-dropped packets :                0                0 pps
    RED-dropped bytes  :                0                0 bps
Queue: 2, Forwarding classes: ef1
  Queued:
    Packets      :                0                0 pps
    Bytes        :                0                0 bps
  Transmitted:
    Packets      :                0                0 pps
    Bytes        :                0                0 bps
    Tail-dropped packets :                0                0 pps
    RED-dropped packets :                0                0 pps
    RED-dropped bytes  :                0                0 bps
Queue: 3, Forwarding classes: nc
  Queued:
    Packets      :                45                0 pps
    Bytes        :               3930                0 bps
  Transmitted:
    Packets      :                45                0 pps
    Bytes        :               3930                0 bps
    Tail-dropped packets :                0                0 pps
    RED-dropped packets :                0                0 pps
    RED-dropped bytes  :                0                0 bps
Queue: 4, Forwarding classes: af11

```

```

Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  RED-dropped bytes  :      0      0 bps
Queue: 5, Forwarding classes: ef11
Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  RED-dropped bytes  :      0      0 bps
Queue: 6, Forwarding classes: af12
Queued:
  Packets      :      31296413      437436 pps
  Bytes       :      4005940864      447935200 bps
Transmitted:
  Packets      :      31296413      437436 pps
  Bytes       :      4005940864      447935200 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  RED-dropped bytes  :      0      0 bps
Queue: 7, Forwarding classes: nc2
Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  RED-dropped bytes  :      0      0 bps

```

show interfaces queue
(Fast Ethernet on a
J4300 Router)

```

user@host> show interfaces queue fe-4/0/0.0
Logical interface fe-4/0/0.0 (Index 71) (SNMP ifIndex 42)
Forwarding classes: 8 supported, 8 in use
Output queues: 8 supported, 8 in use
Queue: 0, Forwarding classes: be
Queued:
  Packets      :      5240762      3404 pps
  Bytes       :      3020710354      15934544 bps
Transmitted:
  Packets      :      5240762      3404 pps
  Bytes       :      3020710354      15934544 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  Low          :      0      0 pps
  Medium-low   :      0      0 pps
  Medium-high  :      0      0 pps
  High         :      0      0 pps
  RED-dropped bytes  :      0      0 bps
  Low          :      0      0 pps
  Medium-low   :      0      0 pps
  Medium-high  :      0      0 pps

```

```

      High                :                0                0 pps
Queue: 1, Forwarding classes: af1
Queued:
  Packets                :            2480391            1650 pps
  Bytes                  :        1304685666        6945704 bps
Transmitted:
  Packets                :            2478740            1650 pps
  Bytes                  :        1303817240        6945704 bps
  Tail-dropped packets :                0                0 pps
  RED-dropped packets  :            1651                0 pps
  Low                   :                0                0 pps
  Medium-low           :                0                0 pps
  Medium-high          :                0                0 pps
  High                 :            1651                0 pps
  RED-dropped bytes    :        868426                0 bps
  Low                  :                0                0 pps
  Medium-low           :                0                0 pps
  Medium-high          :                0                0 pps
  High                 :        868426                0 pps

```

show interfaces queue
(Gigabit Ethernet on a
T640 Router)

```

user@host> show interfaces queue
Physical interface: ge-7/0/1, Enabled, Physical link is Up
Interface index: 150, SNMP ifIndex: 42
Forwarding classes: 8 supported, 8 in use
Output queues: 8 supported, 8 in use
Queue: 0, Forwarding classes: be
Queued:
  Packets                :            13                0 pps
  Bytes                  :            622                0 bps
Transmitted:
  Packets                :            13                0 pps
  Bytes                  :            622                0 bps
  Tail-dropped packets :                0                0 pps
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps
Queue: 1, Forwarding classes: af1
Queued:
  Packets                :        1725947945        372178 pps
  Bytes                  :    220921336960    381110432 bps
Transmitted:
  Packets                :        1725947945        372178 pps
  Bytes                  :    220921336960    381110432 bps
  Tail-dropped packets :                0                0 pps
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps
Queue: 2, Forwarding classes: ef1
Queued:
  Packets                :                0                0 pps
  Bytes                  :                0                0 bps
Transmitted:
  Packets                :                0                0 pps
  Bytes                  :                0                0 bps
  Tail-dropped packets :                0                0 pps
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps
Queue: 3, Forwarding classes: nc
Queued:
  Packets                :            571                0 pps
  Bytes                  :            49318            336 bps
Transmitted:
  Packets                :            571                0 pps

```

| | | | |
|----------------------|---|-------|---------|
| Bytes | : | 49318 | 336 bps |
| Tail-dropped packets | : | 0 | 0 pps |
| RED-dropped packets | : | 0 | 0 pps |
| RED-dropped bytes | : | 0 | 0 bps |

**show interfaces queue
aggregate (Gigabit
Ethernet Enhanced DPC)**

```
user@host> show interfaces queue ge-2/2/9 aggregate
Physical interface: ge-2/2/9, Enabled, Physical link is Up
Interface index: 238, SNMP ifIndex: 71
Forwarding classes: 16 supported, 4 in use
Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets      :      148450735      947295 pps
    Bytes        :      8016344944    409228848 bps
  Transmitted:
    Packets      :      76397439      487512 pps
    Bytes        :     4125461868    210602376 bps
    Tail-dropped packets : Not Available
    RED-dropped packets :      72053285      459783 pps
      Low        :      72053285      459783 pps
      Medium-low :           0          0 pps
      Medium-high :           0          0 pps
      High       :           0          0 pps
    RED-dropped bytes :     3890877444    198626472 bps
      Low        :     3890877444    198626472 bps
      Medium-low :           0          0 bps
      Medium-high :           0          0 bps
      High       :           0          0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets      :           0          0 pps
    Bytes        :           0          0 bps
  Transmitted:
    Packets      :           0          0 pps
    Bytes        :           0          0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets :           0          0 pps
      Low        :           0          0 pps
      Medium-low :           0          0 pps
      Medium-high :           0          0 pps
      High       :           0          0 pps
    RED-dropped bytes :           0          0 bps
      Low        :           0          0 bps
      Medium-low :           0          0 bps
      Medium-high :           0          0 bps
      High       :           0          0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:
    Packets      :      410278257      473940 pps
    Bytes        :     22156199518    204742296 bps
  Transmitted:
    Packets      :      4850003        4033 pps
    Bytes        :     261900162     1742256 bps
    Tail-dropped packets : Not Available
    RED-dropped packets :      405425693      469907 pps
      Low        :      405425693      469907 pps
      Medium-low :           0          0 pps
      Medium-high :           0          0 pps
      High       :           0          0 pps
    RED-dropped bytes :     21892988124    203000040 bps
      Low        :     21892988124    203000040 bps
```

```

    Medium-low      :          0          0 bps
    Medium-high     :          0          0 bps
    High            :          0          0 bps
Queue: 3, Forwarding classes: network-control
  Queued:
    Packets        :          0          0 pps
    Bytes          :          0          0 bps
  Transmitted:
    Packets        :          0          0 pps
    Bytes          :          0          0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :          0          0 pps
    Low           :          0          0 pps
    Medium-low    :          0          0 pps
    Medium-high   :          0          0 pps
    High          :          0          0 pps
  RED-dropped bytes  :          0          0 bps
    Low           :          0          0 bps
    Medium-low    :          0          0 bps
    Medium-high   :          0          0 bps
    High          :          0          0 bps
Forwarding classes: 16 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets        :      76605230      485376 pps
    Bytes          :      5209211400    264044560 bps
  Transmitted:
    Packets        :      76444631      484336 pps
    Bytes          :      5198235612    263478800 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :      160475      1040 pps
    Low           :      160475      1040 pps
    Medium-low    :          0          0 pps
    Medium-high   :          0          0 pps
    High          :          0          0 pps
  RED-dropped bytes  :      10912300    565760 bps
    Low           :      10912300    565760 bps
    Medium-low    :          0          0 bps
    Medium-high   :          0          0 bps
    High          :          0          0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets        :          0          0 pps
    Bytes          :          0          0 bps
  Transmitted:
    Packets        :          0          0 pps
    Bytes          :          0          0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :          0          0 pps
    Low           :          0          0 pps
    Medium-low    :          0          0 pps
    Medium-high   :          0          0 pps
    High          :          0          0 pps
  RED-dropped bytes  :          0          0 bps
    Low           :          0          0 bps
    Medium-low    :          0          0 bps
    Medium-high   :          0          0 bps
    High          :          0          0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:

```

```

Packets          :          4836136          3912 pps
Bytes           :          333402032        2139056 bps
Transmitted:
Packets          :          3600866          1459 pps
Bytes           :          244858888        793696 bps
Tail-dropped packets : Not Available
RED-dropped packets :          1225034          2450 pps
  Low            :          1225034          2450 pps
  Medium-low     :              0              0 pps
  Medium-high    :              0              0 pps
  High           :              0              0 pps
RED-dropped bytes  :          83302312        1333072 bps
  Low            :          83302312        1333072 bps
  Medium-low     :              0              0 bps
  Medium-high    :              0              0 bps
  High           :              0              0 bps
Queue: 3, Forwarding classes: network-control
Queued:
Packets          :              0              0 pps
Bytes           :              0              0 bps
Transmitted:
Packets          :              0              0 pps
Bytes           :              0              0 bps
Tail-dropped packets : Not Available
RED-dropped packets :              0              0 pps
  Low            :              0              0 pps
  Medium-low     :              0              0 pps
  Medium-high    :              0              0 pps
  High           :              0              0 pps
RED-dropped bytes  :              0              0 bps
  Low            :              0              0 bps
  Medium-low     :              0              0 bps
  Medium-high    :              0              0 bps
  High           :              0              0 bps

Packet Forwarding Engine Chassis Queues:
Queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
Packets          :          77059796          486384 pps
Bytes           :          3544750624        178989576 bps
Transmitted:
Packets          :          77059797          486381 pps
Bytes           :          3544750670        178988248 bps
Tail-dropped packets :              0              0 pps
RED-dropped packets :              0              0 pps
  Low            :              0              0 pps
  Medium-low     :              0              0 pps
  Medium-high    :              0              0 pps
  High           :              0              0 pps
RED-dropped bytes  :              0              0 bps
  Low            :              0              0 bps
  Medium-low     :              0              0 bps
  Medium-high    :              0              0 bps
  High           :              0              0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
Packets          :              0              0 pps
Bytes           :              0              0 bps
Transmitted:
Packets          :              0              0 pps

```

```

Bytes : 0 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
  Low : 0 0 pps
  Medium-low : 0 0 pps
  Medium-high : 0 0 pps
  High : 0 0 pps
RED-dropped bytes : 0 0 bps
  Low : 0 0 bps
  Medium-low : 0 0 bps
  Medium-high : 0 0 bps
  High : 0 0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets : 4846580 3934 pps
  Bytes : 222942680 1447768 bps
Transmitted:
  Packets : 4846580 3934 pps
  Bytes : 222942680 1447768 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
  Low : 0 0 pps
  Medium-low : 0 0 pps
  Medium-high : 0 0 pps
  High : 0 0 pps
RED-dropped bytes : 0 0 bps
  Low : 0 0 bps
  Medium-low : 0 0 bps
  Medium-high : 0 0 bps
  High : 0 0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets : 0 0 pps
  Bytes : 0 0 bps
Transmitted:
  Packets : 0 0 pps
  Bytes : 0 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
  Low : 0 0 pps
  Medium-low : 0 0 pps
  Medium-high : 0 0 pps
  High : 0 0 pps
RED-dropped bytes : 0 0 bps
  Low : 0 0 bps
  Medium-low : 0 0 bps
  Medium-high : 0 0 bps
  High : 0 0 bps

```

**show interfaces queue
(Gigabit Ethernet IQ2)**

```

user@host> show interfaces queue ge-7/1/3
Physical interface: ge-7/1/3, Enabled, Physical link is Up
Interface index: 170, SNMP ifIndex: 70 Forwarding classes: 16 supported, 4 in
use Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
  Packets : 418390039 10 pps
  Bytes : 38910269752 7440 bps
Transmitted:
  Packets : 418390039 10 pps
  Bytes : 38910269752 7440 bps
Tail-dropped packets : Not Available

```



```

RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
Packets : 0 0 pps
Bytes : 0 0 bps
Transmitted:
Packets : 0 0 pps
Bytes : 0 0 bps
Tail-dropped packets : Not Available
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
Packets : 0 0 pps
Bytes : 0 0 bps
Transmitted:
Packets : 0 0 pps
Bytes : 0 0 bps
Tail-dropped packets : Not Available
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 3, Forwarding classes: network-control
Queued:
Packets : 7055 1 pps
Bytes : 451552 512 bps
Transmitted:
Packets : 7055 1 pps
Bytes : 451552 512 bps
Tail-dropped packets : Not Available
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Forwarding classes: 16 supported, 4 in use Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
Packets : 1031 0 pps
Bytes : 143292 0 bps
Transmitted:
Packets : 1031 0 pps
Bytes : 143292 0 bps
Tail-dropped packets : Not Available
RL-dropped packets : 0 0 pps
RL-dropped bytes : 0 0 bps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
Packets : 0 0 pps
Bytes : 0 0 bps
Transmitted:
Packets : 0 0 pps
Bytes : 0 0 bps
Tail-dropped packets : Not Available
RL-dropped packets : 0 0 pps
RL-dropped bytes : 0 0 bps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
Packets : 0 0 pps
Bytes : 0 0 bps

```

```

Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
  Tail-dropped packets : Not Available
  RL-dropped packets :      0      0 pps
  RL-dropped bytes  :      0      0 bps
  RED-dropped packets :      0      0 pps
  RED-dropped bytes  :      0      0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets      :      77009      11 pps
  Bytes       :     6894286     7888 bps
Transmitted:
  Packets      :      77009      11 pps
  Bytes       :     6894286     7888 bps
  Tail-dropped packets : Not Available
  RL-dropped packets :      0      0 pps
  RL-dropped bytes  :      0      0 bps
  RED-dropped packets :      0      0 pps
  RED-dropped bytes  :      0      0 bps

Packet Forwarding Engine Chassis Queues:
Queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
  Packets      :      1031      0 pps
  Bytes       :     147328      0 bps
Transmitted:
  Packets      :      1031      0 pps
  Bytes       :     147328      0 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  Low, non-TCP  :      0      0 pps
  Low, TCP     :      0      0 pps
  High, non-TCP :      0      0 pps
  High, TCP    :      0      0 pps
  RED-dropped bytes :      0      0 bps
  Low, non-TCP  :      0      0 bps
  Low, TCP     :      0      0 bps
  High, non-TCP :      0      0 bps
  High, TCP    :      0      0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
  Tail-dropped packets :      0      0 pps
  RED-dropped packets :      0      0 pps
  Low, non-TCP  :      0      0 pps
  Low, TCP     :      0      0 pps
  High, non-TCP :      0      0 pps
  High, TCP    :      0      0 pps
  RED-dropped bytes :      0      0 bps
  Low, non-TCP  :      0      0 bps
  Low, TCP     :      0      0 bps
  High, non-TCP :      0      0 bps
  High, TCP    :      0      0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:

```

```

Packets      : 0 0 pps
Bytes        : 0 0 bps
Transmitted:
Packets      : 0 0 pps
Bytes        : 0 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
  Low, non-TCP : 0 0 pps
  Low, TCP      : 0 0 pps
  High, non-TCP : 0 0 pps
  High, TCP     : 0 0 pps
RED-dropped bytes : 0 0 bps
  Low, non-TCP : 0 0 bps
  Low, TCP      : 0 0 bps
  High, non-TCP : 0 0 bps
  High, TCP     : 0 0 bps
Queue: 3, Forwarding classes: network-control
Queued:
Packets      : 94386 12 pps
Bytes        : 13756799 9568 bps
Transmitted:
Packets      : 94386 12 pps
Bytes        : 13756799 9568 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
  Low, non-TCP : 0 0 pps
  Low, TCP      : 0 0 pps
  High, non-TCP : 0 0 pps
  High, TCP     : 0 0 pps
RED-dropped bytes : 0 0 bps
  Low, non-TCP : 0 0 bps
  Low, TCP      : 0 0 bps
  High, non-TCP : 0 0 bps
  High, TCP     : 0 0 bps

```

**show interfaces queue
both-ingress-egress
(Gigabit Ethernet IQ2)**

```

user@host> show interfaces queue ge-6/2/0 both-ingress-egress
Physical interface: ge-6/2/0, Enabled, Physical link is Up
Interface index: 175, SNMP ifIndex: 121
Forwarding classes: 8 supported, 4 in use
Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
Packets      : Not Available
Bytes        : 0 0 bps
Transmitted:
Packets      : 254 0 pps
Bytes        : 16274 0 bps
Tail-dropped packets : Not Available
RED-dropped packets : 0 0 pps
RED-dropped bytes   : 0 0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
Packets      : Not Available
Bytes        : 0 0 bps
Transmitted:
Packets      : 0 0 pps
Bytes        : 0 0 bps
Tail-dropped packets : Not Available
RED-dropped packets : 0 0 pps
RED-dropped bytes   : 0 0 bps
Queue: 2, Forwarding classes: assured-forwarding

```

```

Queued:
  Packets          : Not Available
  Bytes           :                0                0 bps
Transmitted:
  Packets          :                0                0 pps
  Bytes           :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :                0                0 pps
  RED-dropped bytes  :                0                0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets          : Not Available
  Bytes           :                0                0 bps
Transmitted:
  Packets          :                0                0 pps
  Bytes           :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :                0                0 pps
  RED-dropped bytes  :                0                0 bps
Forwarding classes: 8 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
  Packets          : Not Available
  Bytes           :                0                0 bps
Transmitted:
  Packets          :                3                0 pps
  Bytes           :               126                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :                0                0 pps
  RED-dropped bytes  :                0                0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
  Packets          : Not Available
  Bytes           :                0                0 bps
Transmitted:
  Packets          :                0                0 pps
  Bytes           :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :                0                0 pps
  RED-dropped bytes  :                0                0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets          : Not Available
  Bytes           :                0                0 bps
Transmitted:
  Packets          :                0                0 pps
  Bytes           :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :                0                0 pps
  RED-dropped bytes  :                0                0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets          : Not Available
  Bytes           :                0                0 bps
Transmitted:
  Packets          :                0                0 pps
  Bytes           :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :                0                0 pps
  RED-dropped bytes  :                0                0 bps

```

```

Packet Forwarding Engine Chassis Queues:
Queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets      :      80564692      0 pps
    Bytes        :      3383717100    0 bps
  Transmitted:
    Packets      :      80564692      0 pps
    Bytes        :      3383717100    0 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets      :      80564685      0 pps
    Bytes        :      3383716770    0 bps
  Transmitted:
    Packets      :      80564685      0 pps
    Bytes        :      3383716770    0 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:
    Packets      :      0      0 pps
    Bytes        :      0      0 bps
  Transmitted:
    Packets      :      0      0 pps
    Bytes        :      0      0 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps
Queue: 3, Forwarding classes: network-control
  Queued:
    Packets      :      9397      0 pps
    Bytes        :      3809052      232 bps
  Transmitted:
    Packets      :      9397      0 pps
    Bytes        :      3809052      232 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps

```

**show interfaces queue
ingress
(Gigabit Ethernet IQ2)**

```

user@host> show interfaces queue ge-6/2/0 ingress
Physical interface: ge-6/2/0, Enabled, Physical link is Up
Interface index: 175, SNMP ifIndex: 121
Forwarding classes: 8 supported, 4 in use
Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets      : Not Available
    Bytes        :      0      0 bps
  Transmitted:
    Packets      :      288      0 pps
    Bytes        :      18450      0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets      : Not Available

```

```

    Bytes                :                0                0 bps
  Transmitted:
    Packets              :                0                0 pps
    Bytes                :                0                0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets  :                0                0 pps
    RED-dropped bytes    :                0                0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets              : Not Available
  Bytes                :                0                0 bps
Transmitted:
  Packets              :                0                0 pps
  Bytes                :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets              : Not Available
  Bytes                :                0                0 bps
Transmitted:
  Packets              :                0                0 pps
  Bytes                :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps

```

**show interfaces queue
egress (Gigabit Ethernet
IQ2)**

```

user@host> show interfaces queue ge-6/2/0 egress
Physical interface: ge-6/2/0, Enabled, Physical link is Up
  Interface index: 175, SNMP ifIndex: 121
  Forwarding classes: 8 supported, 4 in use
  Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
  Packets              : Not Available
  Bytes                :                0                0 bps
Transmitted:
  Packets              :                3                0 pps
  Bytes                :               126                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
  Packets              : Not Available
  Bytes                :                0                0 bps
Transmitted:
  Packets              :                0                0 pps
  Bytes                :                0                0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets  :                0                0 pps
  RED-dropped bytes    :                0                0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets              : Not Available
  Bytes                :                0                0 bps
Transmitted:
  Packets              :                0                0 pps
  Bytes                :                0                0 bps
  Tail-dropped packets : Not Available

```

```

RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 3, Forwarding classes: network-control
Queued:
Packets : Not Available
Bytes : 0 0 bps
Transmitted:
Packets : 0 0 pps
Bytes : 0 0 bps
Tail-dropped packets : Not Available
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Packet Forwarding Engine Chassis Queues:
Queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
Packets : 80564692 0 pps
Bytes : 3383717100 0 bps
Transmitted:
Packets : 80564692 0 pps
Bytes : 3383717100 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
Packets : 80564685 0 pps
Bytes : 3383716770 0 bps
Transmitted:
Packets : 80564685 0 pps
Bytes : 3383716770 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
Packets : 0 0 pps
Bytes : 0 0 bps
Transmitted:
Packets : 0 0 pps
Bytes : 0 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Queue: 3, Forwarding classes: network-control
Queued:
Packets : 9538 0 pps
Bytes : 3819840 0 bps
Transmitted:
Packets : 9538 0 pps
Bytes : 3819840 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps

```

**show interfaces queue
remaining-traffic
(Gigabit Ethernet
Enhanced DPC)**

```

user@host> show interfaces queue ge-2/2/9 remaining-traffic
Physical interface: ge-2/2/9, Enabled, Physical link is Up
Interface index: 238, SNMP ifIndex: 71
Forwarding classes: 16 supported, 4 in use
Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort

```

```

Queued:
  Packets      :      110208969      472875 pps
  Bytes       :      5951284434     204282000 bps
Transmitted:
  Packets      :      110208969      472875 pps
  Bytes       :      5951284434     204282000 bps
Tail-dropped packets : Not Available
RED-dropped packets :      0      0 pps
  Low          :      0      0 pps
  Medium-low   :      0      0 pps
  Medium-high  :      0      0 pps
  High         :      0      0 pps
RED-dropped bytes  :      0      0 bps
  Low          :      0      0 bps
  Medium-low   :      0      0 bps
  Medium-high  :      0      0 bps
  High         :      0      0 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Tail-dropped packets : Not Available
RED-dropped packets :      0      0 pps
  Low          :      0      0 pps
  Medium-low   :      0      0 pps
  Medium-high  :      0      0 pps
  High         :      0      0 pps
RED-dropped bytes  :      0      0 bps
  Low          :      0      0 bps
  Medium-low   :      0      0 bps
  Medium-high  :      0      0 bps
  High         :      0      0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Tail-dropped packets : Not Available
RED-dropped packets :      0      0 pps
  Low          :      0      0 pps
  Medium-low   :      0      0 pps
  Medium-high  :      0      0 pps
  High         :      0      0 pps
RED-dropped bytes  :      0      0 bps
  Low          :      0      0 bps
  Medium-low   :      0      0 bps
  Medium-high  :      0      0 bps
  High         :      0      0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Transmitted:
  Packets      :      0      0 pps
  Bytes       :      0      0 bps
Tail-dropped packets : Not Available

```



```

RED-dropped packets :          0          0 pps
  Low                :          0          0 pps
  Medium-low         :          0          0 pps
  Medium-high        :          0          0 pps
  High               :          0          0 pps
RED-dropped bytes   :          0          0 bps
  Low                :          0          0 bps
  Medium-low         :          0          0 bps
  Medium-high        :          0          0 bps
  High               :          0          0 bps
Forwarding classes: 16 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets          :          109355853      471736 pps
    Bytes            :          7436199152     256627968 bps
  Transmitted:
    Packets          :          109355852      471736 pps
    Bytes            :          7436198640     256627968 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :          0          0 pps
    Low              :          0          0 pps
    Medium-low       :          0          0 pps
    Medium-high      :          0          0 pps
    High             :          0          0 pps
  RED-dropped bytes   :          0          0 bps
    Low              :          0          0 bps
    Medium-low       :          0          0 bps
    Medium-high      :          0          0 bps
    High             :          0          0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets          :          0          0 pps
    Bytes            :          0          0 bps
  Transmitted:
    Packets          :          0          0 pps
    Bytes            :          0          0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :          0          0 pps
    Low              :          0          0 pps
    Medium-low       :          0          0 pps
    Medium-high      :          0          0 pps
    High             :          0          0 pps
  RED-dropped bytes   :          0          0 bps
    Low              :          0          0 bps
    Medium-low       :          0          0 bps
    Medium-high      :          0          0 bps
    High             :          0          0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:
    Packets          :          0          0 pps
    Bytes            :          0          0 bps
  Transmitted:
    Packets          :          0          0 pps
    Bytes            :          0          0 bps
  Tail-dropped packets : Not Available
  RED-dropped packets :          0          0 pps
    Low              :          0          0 pps
    Medium-low       :          0          0 pps
    Medium-high      :          0          0 pps
    High             :          0          0 pps

```

```

RED-dropped bytes      :                0          0 bps
  Low                  :                0          0 bps
  Medium-low           :                0          0 bps
  Medium-high          :                0          0 bps
  High                 :                0          0 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets              :                0          0 pps
  Bytes               :                0          0 bps
Transmitted:
  Packets              :                0          0 pps
  Bytes               :                0          0 bps
Tail-dropped packets : Not Available
RED-dropped packets   :                0          0 pps
  Low                  :                0          0 pps
  Medium-low           :                0          0 pps
  Medium-high          :                0          0 pps
  High                 :                0          0 pps
RED-dropped bytes     :                0          0 bps
  Low                  :                0          0 bps
  Medium-low           :                0          0 bps
  Medium-high          :                0          0 bps
  High                 :                0          0 bps

```

show interfaces routing

| | |
|---------------------------------|---|
| Syntax | show interfaces routing <brief detail> <interface-name> <logical-system (all <i>logical-system-name</i>)> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Have the routing protocol process display its view of the state of the router's interfaces. Use this command for performing router diagnostics only, when you are determining whether the routing protocols and the JUNOS software disagree about the state of an interface. |
| Options | <p>none—Display standard information about the state of all router interfaces on all logical systems.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>interface-name—(Optional) Name of a specific interface.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| Additional Information | For information about how to configure routing protocols, see the <i>JUNOS Routing Protocols Configuration Guide</i> . For information about related operational mode commands for routing instances and protocols, see the <i>JUNOS Routing Protocols and Policies Command Reference</i> . |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces routing brief on page 72</p> <p>show interfaces routing detail on page 73</p> |
| Output Fields | Table 23 on page 71 lists the output fields for the <code>show interfaces routing</code> command. Output fields are listed in the approximate order in which they appear. |

Table 23: show interfaces routing Output Fields

| Field Name | Field Description | Level of Output |
|------------|---|-----------------|
| Interface | Name of the physical interface. | none brief |
| State | State of the physical interface: Up or Down. | none brief |
| Addresses | Protocols and addresses configured on the interface. | none brief |
| Index | Interface index number, which reflects its initialization sequence. | detail |
| RefCount | Number of references to the interface in the routing software. | detail |
| State | State (Up or Down) and type of interface. | detail |

Table 23: show interfaces routing Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------|---|-----------------|
| Change | <p>Reflects one or more of the following recent changes to the interface:</p> <ul style="list-style-type: none"> ■ Add—The interface was just added. ■ Address—The interface's link-layer address has changed. ■ Delete—The interface is being deleted. ■ Encapsulation—The type of encapsulation on the interface has changed. ■ Metric—The interface's metric value has changed. ■ MTU—The interface's maximim transmission unit size has changed. ■ UpDown—The interface has made an up or down transition. | detail |
| Up/down transitions | Number of times the interface has gone from Down to Up . | detail |
| Link layer | Describes the link layer of the interface. | detail |
| Encapsulation | Encapsulation on the interface. | detail |
| Bandwidth | Speed at which the interface is running. | detail |
| Protocol address | <p>Information about the configuration of protocols on the interface:</p> <ul style="list-style-type: none"> ■ Address—Address configured on the interface for the protocol type. ■ State—State (Up or down) and type of interface. ■ Change—Reflects one or more of the following recent changes to the interface: <ul style="list-style-type: none"> ■ Add—The interface was just added. ■ Address—The interface's address has changed. ■ Broadcast—The interface's broadcast address has changed. ■ Delete—The interface is being deleted. ■ Netmask—The interface's netmask has changed. ■ UpDown—The interface has made an up or down transition. ■ Preference—Preference value for the route for this address. ■ Metric—Metric value on the interface for the protocol type. ■ MTU—Maximim transmission unit value of the interface. ■ Local address—On a point-to-point link, the address of the local side of the link. Not used for multicast links. ■ Destination—For a point-to-point link, the address of the remote side of the link. For multicast links, the network address. | detail |

```

show interfaces routing brief
user@host> show interfaces routing brief
Interface      State Addresses
so-5/0/3.0     Down  ISO    enabled
so-5/0/2.0     Up    MPLS   enabled
               ISO    enabled
               INET   192.168.2.120
               INET   enabled
so-5/0/1.0     Up    MPLS   enabled
               ISO    enabled
               INET   192.168.2.130

```

```

at-1/0/0.3      Up      INET  enabled
at-1/0/0.2      Up      CCC   enabled
at-1/0/0.0      Up      ISO   enabled
                INET   192.168.90.10
1o0.0           Up      ISO   47.0005.80ff.f800.0000.0108.0001.1921.6800.5061.00
                ISO    enabled
                INET   127.0.0.1
fxp1.0          Up
fxp0.0          Up      INET  192.168.6.90

```

**show interfaces routing
detail**

```

user@host> show interfaces routing detail
so-5/0/3.0
  Index: 15, Refcount: 2, State: Up <Broadcast PointToPoint Multicast> Change:<>

  Metric: 0, Up/down transitions: 0, Full-duplex
  Link layer: HDLC serial line Encapsulation: PPP Bandwidth: 155Mbps
  ISO address (null)
    State: <Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
so-5/0/2.0
  Index: 14, Refcount: 7, State: <Up Broadcast PointToPoint Multicast> Change:<>

  Metric: 0, Up/down transitions: 0, Full-duplex
  Link layer: HDLC serial line Encapsulation: PPP Bandwidth: 155Mbps
  MPLS address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4458 bytes
  ISO address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
  INET address 192.168.2.120
    State: <Up Broadcast PointToPoint Multicast Localup> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
    Local address: 192.168.2.120
    Destination: 192.168.2.110/32
  INET address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
...

```

show interfaces routing summary

| | |
|---------------------------------|---|
| Syntax | show interfaces routing summary <interface-name> <logical-system (all logical-system-name)> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Have the routing protocol process display a summary of its view of the state of the router interfaces. Use this command for performing router diagnostics only, when you are determining whether the routing protocols and the JUNOS software disagree about the state of an interface. |
| Options | <p>none—Display summary information about the state of all router interfaces on all logical systems.</p> <p>interface-name—(Optional) Name of a specific interface.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| Additional Information | For information about how to configure routing protocols, see the <i>JUNOS Routing Protocols Configuration Guide</i> . For information about related operational mode commands for routing instances and protocols, see the <i>JUNOS Routing Protocols and Policies Command Reference</i> . |
| Required Privilege Level | view |
| List of Sample Output | show interfaces routing summary on page 75 |
| Output Fields | Table 24 on page 74 lists the output fields for the show interfaces routing summary command. Output fields are listed in the approximate order in which they appear. |

Table 24: show interfaces routing summary Output Fields

| Field Name | Field Description |
|--------------------------------|--|
| n physical interfaces | Number of routing interfaces and number of interfaces in the up state. |
| n protocol protocol interfaces | Type and number of routing protocols and number of related interfaces in the up state. |
| Interface | Logical interface name. |
| Index | Logical interface index number, which reflects its initialization sequence. |
| Metric | Metric value for the interface. |
| Trans | Number of times the interface has transitioned from Down to Up). |
| Status | Interface status (Up or Down) and type. |

```

show interfaces routing user@host> show interfaces routing summary
summary
14 physical interfaces (12 up)
  11 INET protocol addresses (11 up)
  6 ISO protocol addresses (4 up)
  3 MPLS protocol addresses (3 up)
  3 CCC protocol addresses (3 up)
Interface  Index    Metric  Trans. Status
so-5/0/3.0   15        0        0 Broadcast PointToPoint Multicast
so-5/0/2.0   14        0        0 Up Broadcast PointToPoint Multicast
so-5/0/1.0   13        0        5 Up Broadcast PointToPoint Multicast
so-5/0/0.0   12        0        2 Up Broadcast PointToPoint Multicast
so-1/2/0.0   11        0        0 Broadcast PointToPoint Multicast
so-1/1/0.0   10        0        5 Up Broadcast PointToPoint Multicast
at-1/0/0.6    9        0        0 Up Broadcast PointToPoint Multicast
at-1/0/0.5    8        0        0 Up Broadcast PointToPoint Multicast
at-1/0/0.4    7        0        0 Up Broadcast PointToPoint Multicast
at-1/0/0.3    6        0        0 Up Broadcast PointToPoint Multicast
at-1/0/0.2    5        0        0 Up Broadcast PointToPoint Multicast
at-1/0/0.0    4        0        0 Up Broadcast PointToPoint Multicast
lo0.0        3        0        0 Up Broadcast Loopback Multicast
fxp1.0       2        0        1 Up Broadcast Multicast
fxp0.0       1        0        0 Up Broadcast Multicast

```

show interfaces routing-instance

| | |
|---|--|
| Syntax | show interfaces routing-instance (<i>instance-name</i> all) |
| Release Information | Command introduced in JUNOS Release 9.1. |
| Description | Display information about the interfaces configured for either a specific routing instance or for all of the routing instances. |
| Options | <p>all—Display information about all of the interfaces configured for all of the routing instances on the router.</p> <p><i>instance-name</i>—Display information about the interfaces configured for the specified routing instance.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces routing-instance terse on page 76</p> <p>show interfaces routing-instance all on page 76</p> <p>show interfaces routing-instance extensive on page 76</p> |
| Output Fields | The output fields from the show interfaces routing-instance command are identical to those produced by the show interfaces <i>interface-name</i> command. For a description of output fields, see the other chapters in this manual. |
| show interfaces routing-instance terse | <pre> user@host> show interfaces routing-instance sample terse Interface Admin Link Proto Local Remote ge-0/0/0.0 up up inet 192.168.4.28/24 </pre> |
| show interfaces routing-instance all | <pre> user@host> show interfaces terse routing-instance all Interface Admin Link Proto Local Remote Instance at-0/0/1 up up inet 10.0.0.1/24 ge-0/0/0.0 up up inet 192.168.4.28/24 sample-a at-0/1/0.0 up up inet6 fe80::a:0:0:4/64 sample-b so-0/0/0.0 up up inet 10.0.0.1/32 </pre> |
| show interfaces routing-instance extensive | <pre> user@host> show interfaces fe-0/1/3 routing-instance instance2 extensive Logical interface fe-0/1/3.0 (Index 70) (SNMP ifIndex 53) (Generation 211) Flags: SNMP-Traps Encapsulation: ENET2 Traffic statistics: Input bytes : 0 Output bytes : 42 Input packets: 0 Output packets: 1 IPv6 transit statistics: Input bytes : 0 Output bytes : 0 Input packets: 0 Output packets: 0 Local statistics: Input bytes : 0 Output bytes : 42 Input packets: 0 Output packets: 1 Transit statistics: </pre> |


```
Input bytes :          0          0 bps
Output bytes :         0          0 bps
Input packets:         0          0 pps
Output packets:        0          0 pps
IPv6 transit statistics:
  Input bytes :         0
  Output bytes :         0
  Input packets:         0
  Output packets:        0
Protocol inet, MTU: 1500, Generation: 252, Route table: 4
  Flags: Is-Primary
  Addresses, Flags: Is-Default Is-Preferred Is-Primary
  Destination: 150.1.1/24, Local: 150.1.1.1, Broadcast: 150.1.1.255,
Generation: 263
```

show interfaces snmp-index

| | |
|-----------------------------------|--|
| Syntax | show interfaces snmp-index <i>snmp-index</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display information for the interface with the specified SNMP index. |
| Options | This command has no options. |
| Additional Information | Output from both the show interfaces <i>interface-name</i> detail and the show interfaces <i>interface-name</i> extensive command includes all the information displayed in the output from the show interfaces snmp-index command. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces snmp-index on page 78 |
| Output Fields | The output fields from the show interfaces snmp-index <i>snmp-index</i> command are identical to those produced by the show interfaces <i>interface-name</i> command. For a description of output fields, see the other chapters in this manual. |
| show interfaces snmp-index | <pre> user@host> show interfaces snmp-index 33 Physical interface: so-2/1/1, Enabled, Physical link is Down Interface index: 149, SNMP ifIndex: 33 Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: 0C48, Loopback: None, FCS: 16, Payload scrambler: Enabled Device flags : Present Running Down Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384 Link flags : Keepalives CoS queues : 8 supported Last flapped : 2005-06-15 11:45:57 PDT (05:38:43 ago) Input rate : 0 bps (0 pps) Output rate : 0 bps (0 pps) SONET alarms : LOL, PLL, LOS SONET defects : LOL, PLL, LOF, LOS, SEF, AIS-L, AIS-P </pre> |

show interfaces source-class

| | |
|---------------------------------|---|
| Syntax | show interfaces source-class (all <i>destination-class-name logical-interface-name</i>) |
| Release Information | Command introduced before JUNOS Release 7.4. all option introduced in JUNOS Release 8.0. |
| Description | Display information about interfaces grouped by source class. |
| Options | all—Display information about all configured source classes. <i>source-class-name</i> —Name of a logical grouping of prefixes that count packets having the source address matching those prefixes. <i>interface-name</i> —Name of a logical interface. |
| Additional Information | For interfaces that carry IPv4, IPv6, or Multiprotocol Label Switching (MPLS) traffic, you can maintain packet counts based on the entry and exit points for traffic passing through your network. Entry and exit points are identified by source and destination prefixes grouped into sets defined as source classes and destination classes. For more information, see the <i>JUNOS Network Interfaces Configuration Guide</i> . |
| Required Privilege Level | view |
| List of Sample Output | show interfaces source-class all on page 80 |
| Output Fields | Table 25 on page 79 lists the output fields for the show interfaces source-class command. Output fields are listed in the approximate order in which they appear. |

Table 25: show interfaces source-class Output Fields

| Field Name | Field Description |
|-------------------|---|
| Logical interface | Name of the logical interface. |
| Source class | Source class usage (SCU) counters per class for this interface. |
| Packets | Packets going to designated user-selected prefixes. |
| Bytes | Bytes going to designated user-selected prefixes. |

show interfaces user@host> **show interfaces source-class all**

source-class all Logical interface so-0/1/0.0

| Source class | Packets (packet-per-second) | Bytes (bits-per-second) |
|--------------|--------------------------------|----------------------------|
| gold | 1928095 | 161959980 |
| (| 889) | (|
| bronze | 0 | 0 |
| (| 0) | (|
| silver | 0 | 0 |
| (| 0) | (|

Logical interface so-0/1/3.0

| Source class | Packets (packet-per-second) | Bytes (bits-per-second) |
|--------------|--------------------------------|----------------------------|
| gold | 0 | 0 |
| (| 0) | (|
| bronze | 0 | 0 |
| (| 0) | (|
| silver | 116113 | 9753492 |
| (| 939) | (|

show interfaces statistics

| | |
|--------------------------|---|
| Syntax | show interfaces statistics <i>interface-name</i> <detail> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display static interface statistics, such as errors. |
| Options | <i>interface-name</i> —Name of an interface. detail—(Optional) Display detail output. |
| Required Privilege Level | view |
| Related Topics | clear interfaces statistics |
| List of Sample Output | show interfaces statistics (Fast Ethernet) on page 81 show interfaces statistics detail (Aggregated Ethernet) on page 82 |
| Output Fields | Output from both the show interfaces <i>interface-name</i> detail and the show interfaces <i>interface-name</i> extensive commands include all the information displayed in the output from the show interfaces statistics command. For more information, see the particular interface type in which you are interested. For information about destination class and source class statistics, see “Destination Class Field” on page 87 and “Source Class Field” on page 93, respectively. |

```
user@host> show interfaces fe-1/3/1 statistics
Physical interface: fe-1/3/1, Enabled, Physical link is Up
Interface index: 144, SNMP ifIndex: 1042
Description: ford fe-1/3/1
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
CoS queues     : 4 supported, 4 maximum usable queues
Current address: 00:90:69:93:04:dc, Hardware address: 00:90:69:93:04:dc
Last flapped   : 2006-04-18 03:08:59 PDT (00:01:24 ago)
Statistics last cleared: Never
Input rate      : 0 bps (0 pps)
Output rate     : 0 bps (0 pps)
Input errors: 0, Output errors: 0
Active alarms  : None
Active defects  : None
Logical interface fe-1/3/1.0 (Index 69) (SNMP ifIndex 50)
Flags: SNMP-Traps Encapsulation: ENET2
Protocol inet, MTU: 1500
Flags: Is-Primary, DCU, SCU-in

          Packets                               Bytes
Destination class (packet-per-second) (bits-per-second)
          silver1 0 0
          ( 0) ( 0)
          silver2 0 0
          ( 0) ( 0)
          silver3 0 0
          ( 0) ( 0)
```

Addresses, Flags: Is-Default Is-Preferred Is-Primary
 Destination: 10.27.245/24, Local: 10.27.245.2,
 Broadcast: 10.27.245.255
 Protocol iso, MTU: 1497
 Flags: Is-Primary

show interfaces
statistics detail
(Aggregated Ethernet)

```
user@host> show interfaces ae0 detail
Physical interface: ae0, Enabled, Physical link is Up
Interface index: 186, SNMP ifIndex: 111, Generation: 187
Link-level type: Ethernet, MTU: 1514, Speed: 2000mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Disabled, Minimum links needed: 1,
Minimum bandwidth needed: 0
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Current address: 00:90:69:0b:2f:f0, Hardware address: 00:90:69:0b:2f:f0
Last flapped : Never
Statistics last cleared: 2006-12-23 03:04:16 PST (01:16:24 ago)
Traffic statistics:
Input bytes :                28544                0 bps
Output bytes :               39770                0 bps
Input packets:                 508                0 pps
Output packets:                509                0 pps
Input bytes :                IPv6 28544
Output bytes :                 IPv6 0
Input packets:                 IPv6 508
Output packets:                 IPv6 0
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
Policed discards: 0, Resource errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
Resource errors: 0

Logical interface ae0.0 (Index 67) (SNMP ifIndex 139) (Generation 145)
Flags: SNMP-Traps Encapsulation: ENET2
Statistics          Packets          pps          Bytes          bps
Bundle:
  Input :             508             0          28544             0
  Output:             509             0          35698             0
Link:
  ge-3/3/8.0
    Input :             508             0          28544             0
    Output:              0             0              0             0
  ge-3/3/9.0
    Input :              0             0              0             0
    Output:              0             0              0             0
Marker Statistics:  Marker Rx      Resp Tx      Unknown Rx      Illegal Rx
  ge-3/3/8.0           0           0           0           0
  ge-3/3/9.0           0           0           0           0
Egress queues: 8 supported, 8 in use
Queue counters:      Queued packets  Transmitted packets  Dropped packets

0 best-effort                0                0                0
1 expedited-fo                0                0                0
2 assured-forw                0                0                0
3 network-cont                0                0                0

Protocol inet, MTU: 1500, Generation: 166, Route table: 0
```

```
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.1.1/24, Local: 10.1.1.1, Broadcast: 10.1.1.255,
  Generation: 159
Protocol inet6, MTU: 1500, Generation: 163, Route table: 0
Flags: Is-Primary
Addresses, Flags: Is-Preferred
  Destination: fe80::/64, Local: fe80::206:5bff:fe05:c321,
  Broadcast: Unspecified, Generation: 161
```

show interfaces terse

| | |
|---------------------------------|---|
| Syntax | show interfaces terse |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display summary information about interfaces. |
| Options | This command has no options. |
| Additional Information | Interfaces are always displayed in numerical order, from the lowest to the highest FPC slot number. Within that slot, the lowest PIC slot is shown first. On an individual PIC, the lowest port number is always first. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces terse on page 84 |
| Output Fields | Table 26 on page 84 lists the output fields for the show interfaces terse command. Output fields are listed in the approximate order in which they appear. |

Table 26: show interfaces terse Output Fields

| Field Name | Field Description |
|------------|---|
| Interface | Interface name. |
| Admin | Whether the interface is turned on (up) or off (down). |
| Link | Link state: up or down. |
| Proto | Protocol family configured on the logical interface. A logical interface on a router that supports Ethernet OAM always shows the multiservice protocol. |
| Local | Local IP address of the logical interface. |
| Remote | Remote IP address of the logical interface. |

```

show interfaces terse user@host> show interfaces terse
Interface      Admin Link Proto  Local          Remote
t1-0/1/0:0     up   up
t1-0/1/0:0.0   up   up   inet   192.168.220.18/30
t1-0/1/0:1     up   up
t1-0/1/0:2     up   up
t1-0/1/0:3     up   up
at-1/0/0       up   up
at-1/0/1       up   up
dsc            up   up
fxp0           up   up
fxp0.0         up   up   inet   192.168.71.249/21
fxp1           up   up
fxp1.0         up   up   inet   10.0.0.4/8

```


| | | | | | | |
|-----------|----|----|------|-----------|-----|-----|
| | | | tnp | 4 | | |
| gre | up | up | | | | |
| ipip | up | up | | | | |
| lo0 | up | up | | | | |
| lo0.0 | up | up | inet | 10.0.1.4 | --> | 0/0 |
| | | | | 127.0.0.1 | --> | 0/0 |
| lo0.16385 | up | up | inet | | | |
| lsi | up | up | | | | |
| mtun | up | up | | | | |

Chapter 3

Common Output Fields

This chapter explains the content of the following fields, which appear in the output of most **show interfaces** commands:

- Destination Class Field on page 87
- Enabled Field on page 88
- Filters Field on page 88
- Flags Fields on page 88
- Label-Switched Interface Traffic Statistics Field on page 91
- Policer Field on page 92
- Protocol Field on page 92
- RPF Failures Field on page 93
- Source Class Field on page 93

Destination Class Field

For the logical interface, the **Destination class** field provides the names of destination class usage (DCU) counters per family and per class for a particular interface. The counters display packets and bytes arriving from designated user-selected prefixes. For example:

| Destination class | Packets (packet-per-second) | Bytes (bits-per-second) |
|-------------------|--------------------------------|----------------------------|
| gold | 1928095 | 161959980 |
| bronze | (889) | (597762) |
| | 0 | 0 |
| | (0) | (0) |
| silver | 0 | 0 |
| | (0) | (0) |

Enabled Field

For the physical interface, the **Enabled** field provides information about the state of the interface, displaying one or more of the following values:

- **Administratively down, Physical link is Down**—The interface is turned off, and the physical link is inoperable and cannot pass packets even when it is enabled.
- **Administratively down, Physical link is Up**—The interface is turned off, but the physical link is operational and can pass packets when it is enabled.
- **Enabled, Physical link is Down**—The interface is turned on, but the physical link is inoperable and cannot pass packets.
- **Enabled, Physical link is Up**—The interface is turned on, and the physical link is operational and can pass packets.

Filters Field

For the logical interface, the **Filters** field provides the name of the firewall filters to be evaluated when packets are received or transmitted on the interface. The format is **Filters: Input: *filter-name* and Filters: Output: *filter-name***. For example:

```
Filters: Input: sample-all
Filters: Output: cp-ftp
```

Flags Fields

The following sections provide information about flags that are specific to interfaces:

- **Addresses, Flags** on page 88
- **Device Flags** on page 89
- **Family Flags** on page 89
- **Interface Flags** on page 90
- **Link Flags** on page 91
- **Logical Interface Flags** on page 91

Addresses, Flags

The **Addresses, Flags** field, which provides information about the addresses configured for the protocol family on the logical interface, displays one or more of the following values:

- **Dest-route-down**—The routing process detected that the link was not operational and changed the interface routes to nonforwarding status
- **Is-Default**—This address is the default address of the router. The default address is used as the source address by SNMP, ping, traceroute, and other network utilities.
- **Is-Preferred**—This address is the default local address for packets originating from the local router and sent to destinations on the subnet.

- **Is-Primary**—This address is the default local address for broadcast and multicast packets originated locally and sent out the interface.
- **Preferred**—This address is a candidate to become the preferred address.
- **Primary**—This address is a candidate to become the primary address.

Device Flags

The **Device flags** field, which provides information about the physical device, displays one or more of the following values:

- **Down**—Device has been administratively disabled.
- **Hear-Own-Xmit**—Device receives its own transmissions.
- **Link-Layer-Down**—The link-layer protocol has failed to connect with the remote endpoint.
- **Loopback**—Device is in physical loopback.
- **Loop-Detected**—The link layer has received frames that it sent, thereby detecting a physical loopback.
- **No-Carrier**—On media that support carrier recognition, no carrier is currently detected.
- **No-Multicast**—Device does not support multicast traffic.
- **Present**—Device is physically present and recognized.
- **Promiscuous**—Device is in promiscuous mode and recognizes frames addressed to all physical addresses on the media.
- **Quench**—Transmission on the device is quenched, because the output buffer is overflowing.
- **Recv-All-Multicasts**—Device is in multicast promiscuous mode and therefore provides no multicast filtering.
- **Running**—Device is active and enabled.

Family Flags

The **Family flags** field, which provides information about the protocol family on the logical interface, displays one or more of the following values:

- **DCU**—Destination class usage is enabled.
- **Dest-route-down**—The software detected that the link is down and has stopped forwarding the link's interface routes.
- **Down**—Protocol is inactive.
- **Is-Primary**—Interface is the primary one for the protocol.
- **Mac-Validate-Loose**—Interface is enabled with loose MAC address validation.
- **Mac-Validate-Strict**—Interface is enabled with strict MAC address validation.

- **MTU-Protocol-Adjusted**—The effective MTU is not the configured value in the software.
- **No-Redirects**—Protocol redirects are disabled.
- **Primary**—Interface can be considered for selection as the primary family address.
- **Protocol-Down**—Protocol failed to negotiate correctly.
- **SCU-in**—Interface is configured for source class usage input.
- **SCU-out**—Interface is configured for source class usage output.
- **Unnumbered**—Protocol family is configured for unnumbered Ethernet. An unnumbered Ethernet interface borrows an IPv4 address from another interface, which is referred to as the donor interface.
- **Up**—Protocol is configured and operational.
- **uRPF**—Unicast Reverse Path Forwarding is enabled.

Interface Flags

The **Interface flags** field, which provides information about the physical interface, displays one or more of the following values:

- **Admin-Test**—Interface is in test mode and some sanity checking, such as loop detection, is disabled.
- **Disabled**—Interface is administratively disabled.
- **Down**—A hardware failure has occurred.
- **Hardware-Down**—Interface is nonfunctional or incorrectly connected.
- **Link-Layer-Down**—Interface keepalives have indicated that the link is incomplete.
- **No-Multicast**—Interface does not support multicast traffic.
- **No-receive No-transmit**—Passive monitor mode is configured on the interface.
- **Point-To-Point**—Interface is point to point.
- **Pop all MPLS labels from packets of depth**—MPLS labels are removed as packets arrive on an interface that has the **pop-all-labels** statement configured. The depth value can be one of the following:
 - **1**—Takes effect for incoming packets with one label only.
 - **2**—Takes effect for incoming packets with two labels only.
 - **[1 2]**—Takes effect for incoming packets with either one or two labels.
- **Promiscuous**—Interface is in promiscuous mode and recognizes frames addressed to all physical addresses.
- **Recv-All-Multicasts**—Interface is in multicast promiscuous mode and provides no multicast filtering.
- **SNMP-Traps**—SNMP trap notifications are enabled.
- **Up**—Interface is enabled and operational.

Link Flags

The **Link flags** field, which provides information about the physical link, displays one or more of the following values:

- **ACFC**—Address control field compression is configured. The Point-to-Point Protocol (PPP) session negotiates the ACFC option.
- **Give-Up**—Link protocol does not continue connection attempts after repeated failures.
- **Loose-LCP**—PPP does not use Link Control Protocol (LCP) to indicate whether the link protocol is operational.
- **Loose-LMI**—Frame Relay does not use the Local Management Interface (LMI) to indicate whether the link protocol is operational.
- **Loose-NCP**—PPP does not use the Network Control Protocol (NCP) to indicate whether the device is operational.
- **No-Keepalives**—Link protocol keepalives are disabled.
- **PFC**—Protocol field compression is configured. The PPP session negotiates the PFC option.

Logical Interface Flags

The **Logical interface flags** field, which provides information about the logical interface, displays one or more of the following values:

- **ACFC Encapsulation**—Address control field Compression (ACFC) encapsulation is enabled (negotiated successfully with a peer).
- **Device-down**—Device has been administratively disabled.
- **Disabled**—Interface is administratively disabled.
- **Down**—A hardware failure has occurred.
- **Clear-DF-Bit**—GRE tunnel or IPSec tunnel is configured to clear the Don't Fragment (DF) bit.
- **Hardware-Down**—Interface protocol initialization failed to complete successfully.
- **PFC**—Protocol field compression is enabled for the PPP session.
- **Point-To-Point**—Interface is point to point.
- **SNMP-Traps**—SNMP trap notifications are enabled.
- **Up**—Interface is enabled and operational.

Label-Switched Interface Traffic Statistics Field

When you use the `vrf-table-label` statement to configure a VRF routing table, a label-switched interface (LSI) logical interface label is created and mapped to the VRF routing table.

Any routes present in a VRF routing table and configured with the **vrf-table-label** statement are advertised with the LSI logical interface label allocated for the VRF routing table. When packets for this VPN arrive on a core-facing interface, they are treated as if the enclosed IP packet arrived on the LSI interface and are then forwarded and filtered based on the correct table. For more information on the **vrf-table-label** statement, including a list of supported interfaces, see the *JUNOS VPNs Configuration Guide*.

If you configure the **family mpls** statement at the [edit interfaces *interface-name* unit *logical-unit-number*] hierarchy level and you also configure the **vrf-table-label** statement at the [edit routing-instances *routing-instance-name*] hierarchy level, the output for the **show interface *interface-name* extensive** command includes the following output fields about the LSI traffic statistics:

- **Input bytes**—Number of bytes entering the LSI and the current throughput rate in bits per second (bps).
- **Input packets**—Number of packets entering the LSI and the current throughput rate in packets per second (pps).

The following example shows the LSI traffic statistics that you might see as a part of the output of the **show interface *interface-name* extensive** command:

```
Label-switched interface (LSI) traffic statistics:
Input bytes:           0           0 bps
Input packets:        0           0 pps
```

Policer Field

For the logical interface, the **Policer** field provides the policers that are to be evaluated when packets are received or transmitted on the interface. The format is **Policer:** Input: *type-fpc/picport-in-policer*, Output: *type-fpc/pic/port-out-policer*. For example:

```
Policer: Input: at-1/2/0-in-policer, Output: at-2/4/0-out-policer
```

Protocol Field

For the logical interface, the **Protocol** field indicates the protocol family or families that are configured on the interface, displaying one or more of the following values:

- **aenet**—Aggregated Ethernet. Displayed on Fast Ethernet interfaces that are part of an aggregated Ethernet bundle.
- **ccc**—Circuit cross-connect (CCC). Configured on the logical interface of CCC physical interfaces.
- **inet**—IP version 4 (IPv4). Configured on the logical interface for IPv4 protocol traffic, including Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Internet Control Message Protocol (ICMP), and Internet Protocol Control Protocol (IPCP).
- **inet6**—IP version 6 (IPv6). Configured on the logical interface for IPv6 protocol traffic, including Routing Information Protocol for IPv6 (RIPng), Intermediate System-to-Intermediate System (IS-IS), and BGP.

- **iso**—International Organization for Standardization (ISO). Configured on the logical interface for IS-IS traffic.
- **mlfr-uni-nni**—Multilink Frame Relay (MLFR) FRF.16 user-to-network network-to-network (UNI NNI). Configured on the logical interface for link services bundling.
- **mlfr-end-to-end**—Multilink Frame Relay end-to-end. Configured on the logical interface for multilink bundling.
- **mlppp**—MLPPP. Configured on the logical interface for multilink bundling.
- **mpls**—Multiprotocol Label Switching (MPLS). Configured on the logical interface for participation in an MPLS path.
- **tcc**—Translational cross-connect (TCC). Configured on the logical interface of TCC physical interfaces.
- **tnp**—Trivial Network Protocol. Used to communicate between the Routing Engine and the routing platform's packet forwarding components. The JUNOS software automatically configures this protocol family on the routing platform's internal interfaces only.
- **vpls**—Virtual private LAN service (VPLS). Configured on the logical interface on which you configure VPLS.

RPF Failures Field

For the logical interface, the **RPF Failures** field provides information about the amount of incoming traffic (in packets and bytes) that failed a unicast reverse path forwarding (RPF) check on a particular interface. The format is **RPF Failures: Packets: xx, Bytes: yy**. For example:

RPF Failures: Packets: 0, Bytes:0

Source Class Field

For the logical interface, the **Source class** field provides the names of source class usage (SCU) counters per family and per class for a particular interface. The counters display packets and bytes arriving from designated user-selected prefixes. For example:

| Source class | Packets (packet-per-second) | Bytes (bits-per-second) |
|--------------|--------------------------------|----------------------------|
| gold | 1928095 | 161959980 |
| (| 889) | (597762) |
| bronze | 0 | 0 |
| (| 0) | (0) |
| silver | 0 | 0 |
| (| 0) | (0) |

Part 2

Ethernet Interfaces

- Ethernet Interface Operational Mode Commands on page 97
- VRRP Operational Mode Commands on page 227

Chapter 4

Ethernet Interface Operational Mode Commands

Table 27 on page 97 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot aggregated Ethernet, Fast Ethernet, Gigabit Ethernet, and 10-Gigabit Ethernet interfaces. Commands are listed in alphabetical order.

Table 27: Ethernet Interface Operational Mode Commands

| Task | Command |
|--|---|
| Clear learned MAC addresses from the hardware and MAC database. Static MAC addresses are not cleared. | <code>clear interfaces mac-database</code> |
| Clear statistics that are collected for every MAC address, including policer statistics, on a given physical or logical interface. | <code>clear interfaces mac-database statistics</code> |
| Clear statistics that are collected for interface sets. | <code>clear interfaces interface-set statistics</code> |
| Clear Operation, Administration, and Management (OAM) connectivity fault management linktrace database information. | <code>clear oam ethernet connectivity-fault-management linktrace path-database</code> |
| Clear Operation, Administration, and Management (OAM) link fault management state information and restart the link discovery process on Ethernet interfaces. | <code>clear oam ethernet link-fault-management state</code> |
| Clear Operation, Administration, and Management (OAM) statistics link fault management statistics for Ethernet interfaces. | <code>clear oam ethernet link-fault-management statistics</code> |
| Check the reachability of a remote IEEE 802.1ag OAM maintenance association end point (MEP) or maintenance association intermediate point (MIP). | <code>ping ethernet</code> |
| Force LACP link switchover. | <code>request lacp link-switchover</code> |
| Display status information about aggregated Fast Ethernet or Gigabit Ethernet router interfaces. | <code>show interfaces (Aggregated Ethernet)</code> |

Table 27: Ethernet Interface Operational Mode Commands *(continued)*

| Task | Command |
|--|--|
| Display information about IP demultiplexing interfaces using an underlying Ethernet interface. | <code>show interfaces demux0 (Demux Interfaces)</code> |
| Display the transceiver temperature, laser bias current, laser output power, receive optical power, and related alarms for 10-Gigabit Ethernet dense wavelength-division multiplexing (DWDM) interfaces. | <code>show interfaces diagnostics optics (10-Gigabit Ethernet)</code> |
| Display status information about Fast Ethernet interfaces. | <code>show interfaces (Fast Ethernet)</code> |
| Display status information about 10-Gigabit Ethernet router interfaces. | <code>show interfaces (10-Gigabit Ethernet)</code> |
| Display information about Gigabit Ethernet or 10-Gigabit Ethernet router interface sets. | <code>show interfaces interface-set (Ethernet Interface Set)</code> |
| Display information about Gigabit Ethernet or 10-Gigabit Ethernet router interface set queues. | <code>show interfaces interface-set queue</code> |
| Display information about integrated routing and bridging interfaces. | <code>show interfaces irb</code> |
| Display MAC address information for Gigabit Ethernet router interfaces. | <code>show interfaces mac-database (Gigabit Ethernet)</code> |
| Display Link Aggregation Control Protocol (LACP) information for aggregated, Fast Ethernet, or Gigabit Ethernet router interfaces. | <code>show lacp interfaces</code> |
| Display IEEE 802.1ag OAM connectivity fault management forwarding state information for Ethernet interfaces. | <code>show oam ethernet connectivity-fault-management forwarding-state</code> |
| Display OAM connectivity fault management information for Ethernet interfaces. | <code>show oam ethernet connectivity-fault-management interfaces</code> |
| Display OAM connectivity fault management linktrace path database information. | <code>show oam ethernet connectivity-fault-management linktrace path-database</code> |
| Display OAM connectivity fault management maintenance association end point (MEP) database information. | <code>show oam ethernet connectivity-fault-management mep-database</code> |
| Display OAM connectivity fault management path database information for hosts configured with MEP. | <code>show oam ethernet connectivity-fault-management path-database</code> |
| Display OAM fault management statistics for Ethernet interfaces. | <code>show oam ethernet link-fault-management</code> |
| Display protection group Ethernet ring Automatic Protection Switching (APS) | <code>show protection-group ethernet-ring aps</code> |

Table 27: Ethernet Interface Operational Mode Commands *(continued)*

| Task | Command |
|---|--|
| Display protection group Ethernet ring interfaces | show protection-group ethernet-ring interface |
| Display protection group Ethernet ring nodes | show protection-group ethernet-ring node-state |
| Display protection group Ethernet ring statistics | show protection-group ethernet-ring statistics |
| Trace the path between two Ethernet OAM end points. | traceroute ethernet |

clear interfaces mac-database

| | |
|--|--|
| Syntax | clear interfaces mac-database <i>interface-name</i> |
| Release Information | Command introduced in JUNOS Release 8.3. |
| Description | For Gigabit Ethernet IQ2 interfaces, clear learned media access control (MAC) addresses from the hardware and MAC database. Static MAC addresses configured by the operator are not cleared. |
| Options | <i>interface-name</i> —Name of a physical or logical interface. When you clear a physical interface, all learned MAC addresses on all the logical interfaces under the physical interface are cleared. |
| Required Privilege Level | view |
| List of Sample Output | clear interfaces mac-database on page 100 |
| Output Fields | This command produces no output. |
| clear interfaces mac-database | user@host> clear interfaces mac-database ge-0/0/0.0 |

clear interfaces mac-database statistics

| | |
|--|--|
| Syntax | clear interfaces mac-database statistics (<i>interface-name</i> all) |
| Release Information | Command introduced in JUNOS Release 8.3. |
| Description | Clear statistics that are collected for every MAC address, including policer statistics, on a physical or logical interface or all interfaces. |
| Options | (<i>interface-name</i> all)—Clear MAC database statistics for the specified physical or logical gigabit or 10-Gigabit Ethernet interface. Specify all to clear the MAC database statistics for all interfaces. |
| Required Privilege Level | view |
| List of Sample Output | clear interfaces mac-database statistics (Gigabit Ethernet) on page 101 |
| Output Fields | This command produces no output. |
| clear interfaces mac-database statistics (Gigabit Ethernet) | user@host> clear interfaces mac-database statistics ge-0/1/0 |

clear interfaces interface-set statistics

| | |
|---|--|
| Syntax | clear interfaces interface-set statistics (<i>interface-set-name</i> all) |
| Release Information | Command introduced in JUNOS Release 8.5. |
| Description | Clear queue statistics for the specified interface set or all interface sets. |
| Options | (<i>interface-set-name</i> all)—Clear queue statistics for the specified gigabit or 10-Gigabit Ethernet interface set. Specify all to clear queue statistics for all interface sets. |
| Required Privilege Level | view |
| List of Sample Output | clear interfaces interface-set statistics (Gigabit Ethernet) on page 102 |
| Output Fields | This command produces no output. |
| clear interfaces interface-set statistics (Gigabit Ethernet) | <pre>user@host> clear interfaces interface-set statistics ge-2/2/0-0</pre> |

clear oam ethernet connectivity-fault-management linktrace path-database

| | |
|---|--|
| Syntax | clear oam ethernet connectivity-fault-management linktrace path-database mac-address maintenance-association <i>ma-name</i> maintenance-domain <i>md-name</i> |
| Release Information | Command introduced in JUNOS Release 9.0. |
| Description | This command clears all the linktrace entries and the relevant path information from the database for a particular remote-host on M320, MX-series, T320, and T640 routing platforms. |
| Options | <p>mac-address—Clear connectivity fault management path database information for the specified MAC address of the remote host.</p> <p>maintenance-association <i>ma-name</i>—Clear connectivity fault management path database information for the specified maintenance association.</p> <p>maintenance-domain <i>md-name</i>—Clear connectivity fault management path database information for the specified maintenance domain.</p> |
| Required Privilege Level | view |
| clear oam ethernet connectivity-fault-management linktrace path-database | <pre>user@host> clear oam ethernet connectivity-fault-management linktrace path-database maintenance-domain md1 maintenance-association ma3 00058573e483</pre> <p>This command produces no output.</p> |

clear oam ethernet link-fault-management state

| | |
|---|--|
| Syntax | clear oam ethernet link-fault-management state <interface-name> |
| Release Information | Command introduced in JUNOS Release 8.4. |
| Description | On all M-series, MX-series, T320, and T640 routing platforms, clear link fault management state information and restart the link discovery process on Ethernet interfaces. |
| Options | <p>none—Clear OAM link fault management state information and restart the link discovery process on all Ethernet interfaces.</p> <p>interface-name—(Optional) Clear OAM link fault management state information and restart the link discovery process on the specified Ethernet interface only.</p> |
| Required Privilege Level | view |
| List of Sample Output | clear oam ethernet link-fault-management state on page 104 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear oam ethernet link-fault-management state | <pre>user@host> clear oam ethernet link-fault-management state ge-0/3/3 Cleared link-fault-management state for interface ge-0/3/3</pre> |

clear oam ethernet link-fault-management statistics

| | |
|--|---|
| Syntax | clear oam ethernet link-fault-management <interface-name> |
| Release Information | Command introduced in JUNOS Release 8.2. |
| Description | On M320, M120, MX-series, T320, and T640 routing platforms, clear Operation, Administration, and Management (OAM) link fault management statistics or state information from Ethernet interfaces. |
| Options | <p>none—Clear OAM link fault management statistics from all Ethernet interfaces.</p> <p><i>interface-name</i>—(Optional) Clear OAM link fault management statistics from the specified Ethernet interface only.</p> |
| Required Privilege Level | view |
| List of Sample Output | clear oam ethernet link-fault-management statistics on page 105 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear oam ethernet link-fault-management statistics | <pre>user@host> clear oam ethernet link-fault-management statistics</pre> <p>Cleared link-fault-management statistics for all interfaces</p> |

clear protection-group ethernet-ring statistics

| | |
|--|---|
| Syntax | clear protection-group ethernet-ring statistics <group <i>name</i> > |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On MX-series, clear the statistics for all Ethernet ring protection groups or a specific Ethernet ring protection group. |
| Options | group <i>name</i> —Clear protection-group statistics for group specified by the group <i>name</i> . |
| Required Privilege Level | view |
| List of Sample Output | clear protection-group ethernet-ring statistics on page 106 clear protection-group ethernet-ring statistics on page 106 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear protection-group ethernet-ring statistics | <p>To clear all protection-group ethernet-ring statistics for all protection groups, use the following command:</p> <pre>user@host> clear protection-group ethernet-ring statistics Cleared protection-group statistics for all groups</pre> |
| clear protection-group ethernet-ring statistics | <p>To clear protection-group statistics for the group <i>my_prot_group</i>, use the following command:</p> <pre>user@host> clear protection-group ethernet-ring statistics group my_prot_group Cleared protection-group statistics for group my_prot_group</pre> |

ping ethernet

| | |
|---------------------------------|---|
| Syntax | ping ethernet <i>mac-address</i> maintenance-domain <i>md-name</i> maintenance-association <i>ma-name</i> <count <i>count</i> > <size <i>bytes</i> > <wait <i>seconds</i> > |
| Release Information | Command introduced in JUNOS Release 9.1. |
| Description | On M320, MX-series, T320, and T640 routing platforms, check the reachability of a remote IEEE 802.1ag OAM maintenance association end point (MEP) or maintenance association intermediate point (MIP). Type Ctrl+c to interrupt a ping ethernet command. |
| Options | <p><i>mac-address</i>—Send loopback protocol messages to the MEP with the specified Ethernet MAC address.</p> <p>maintenance-association <i>ma-name</i>—Send loopback protocol messages to the MEP for the specified maintenance association.</p> <p>maintenance-domain <i>md-name</i>—Send loopback protocol messages to the MEP for the specified maintenance domain.</p> <p>count <i>count</i>—(Optional) Number of ping requests to send. The range of values is from 1 through 65,535. If the count is not specified 4 loopback messages are sent. Terminate the ping command by typing Ctrl+c.</p> <p>size <i>bytes</i>—(Optional) The length, in bytes, of the data type, length, and value (TLV) sent in the loopback message. The range of values is from 1 through 1400. The default is 64 bytes.</p> <p>wait <i>seconds</i>—(Optional) The amount of time, in seconds, to wait to send the next loopback message. The range of values is from 1 through 255. The default wait time is 1 second.</p> |
| Required Privilege Level | network |
| List of Sample Output | ping ethernet on page 108 |
| Output Fields | Table 28 on page 107 lists the output fields for the ping ethernet command. Output fields are listed in the approximate order in which they appear. |

Table 28: ping ethernet Output Fields

| Field Name | Field Description |
|------------|---|
| PING to | The MAC address of the remote MEP or MIP to which the request message packets are being sent. |
| Interface | The local Ethernet interface from which the request message packets are being sent. |

Table 28: ping ethernet Output Fields (*continued*)


| Field Name | Field Description |
|-----------------|--|
| ping responses | For each loopback message response received, display the number of TLV bytes, the MAC address of the remote MEP or MIP, and the sequence number. |
| ping statistics | Display totals for the following: <ul style="list-style-type: none"> ■ Request packets transmitted ■ Response packets received ■ Expected response packets not received |

```

ping ethernet user@host> ping ethernet maintenance-domain md0 maintenance-association ma0
00:19:e2:b0:75:9c
  PING to 00:19:e2:b0:75:9c, Interface ge-1/1/1.0
    68 bytes from 00:19:e2:b0:75:9c: 1bm_seq=0
    68 bytes from 00:19:e2:b0:75:9c: 1bm_seq=1
    68 bytes from 00:19:e2:b0:75:9c: 1bm_seq=2
    68 bytes from 00:19:e2:b0:75:9c: 1bm_seq=3
    --- ping statistics ---
    4 packets transmitted, 4 packets received, 0% packet loss

```


request interface (revert | switchover) (Aggregated Ethernet Link Protection)

| | |
|---|--|
| Syntax | request interface (revert switchover) aex |
| Release Information | Command introduced in JUNOS Release 8.3. |
| Description | Manually revert egress traffic from the designated backup link to the designated primary link of an aggregated Ethernet interface for which link protection is enabled, or manually switch egress traffic from the primary link to the backup link. This traffic includes transit traffic and local traffic originated on the router itself. |
|  | NOTE: When link protection is enabled on an aggregated Ethernet interface, if the primary link fails, the router automatically routes egress traffic to the backup link. However, the router does not automatically route egress traffic back to the primary link when the primary link is subsequently reestablished. Instead, you manually control when to have traffic diverted back to the primary link by issuing the request interface (revert switchover) (Aggregated Ethernet Link Protection) operational command and specifying the revert keyword. |
| | On M-series and T-series routing platforms, use the request interface (revert switchover) (Adaptive Services) operational command to manually revert to the primary adaptive services interface or link services interface, or to switch from the primary to the secondary interface. For information about this command, see request interface (revert switchover) (Adaptive Services) . |
| Options | <p>revert— Restores egress traffic processing to the primary link.</p> <p>switchover—Transfers egress traffic processing to the secondary (backup) link.</p> <p>aex—Aggregated Ethernet logical interface number: 0 through 15.</p> |
| Required Privilege Level | view |
| List of Sample Output | request interface revert on page 109 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| request interface revert | user@host > request interface revert ae1 |

request lacp link-switchover

Syntax request lacp link-switchover aex

Release Information Command introduced in JUNOS Release 9.3.

Description Manually switch aggregated Ethernet active/standby LACP links.



NOTE: Because this command overrides LACP priority calculations, we strongly recommend that you use this command only when the actor (in this case, the Juniper Networks router) is controlling the active/standby link and the partner (peer) is following. This scenario occurs when you configure only the actor for link protection.

Options aex—Aggregated Ethernet logical interface number: 0 through 15.

Required Privilege Level view

List of Sample Output request lacp link-switchover aeX on page 110

Output Fields When you enter this command, you are provided feedback on the status of your request. To view the switchover, use the **show lacp interfaces** command.

request lacp link-switchover aeX user@host >request lacp link-switchover ae0ae0: Request succeeded

show interfaces (Aggregated Ethernet)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>aenumber</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series, T-series, and MX-series routing platforms only) Display status information about the specified aggregated Fast Ethernet or Gigabit Ethernet interface. |
| Options | <p><i>aenumber</i>—Display standard information about the specified aggregated Fast Ethernet or Gigabit Ethernet interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Aggregated Ethernet) on page 115</p> <p>show interfaces brief (Aggregated Ethernet) on page 115</p> <p>show interfaces detail (Aggregated Ethernet) on page 115</p> <p>show interfaces extensive (Aggregated Ethernet) on page 116</p> <p>show interfaces extensive (Aggregated Ethernet with VLAN Stacking) on page 118</p> |
| Output Fields | Table 29 on page 111 lists the output fields for the show interfaces (Aggregated Ethernet) command. Output fields are listed in the approximate order in which they appear. |

Table 29: Aggregated Ethernet show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface and state of the interface. | All levels |
| Enabled | State of the physical interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Index number of the physical interface, which reflects its initialization sequence. | All levels |

Table 29: Aggregated Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | Maximum transmission unit size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Loopback status: Enabled or Disabled . If loopback is enabled, type of loopback: Local or Remote . | All levels |
| Source filtering | Source filtering status: Enabled or Disabled . | All levels |
| Flow control | Flow control status: Enabled or Disabled . | All levels |
| Minimum links needed | Number of child links that must be operational for the aggregate interface to be operational. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | Hardware MAC address. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hours:minutes:seconds timezone (hours:minutes:seconds ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 29: Aggregated Ethernet show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <p>Input errors on the interface:</p> <ul style="list-style-type: none"> ■ Errors—Sum of incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | detail extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions —Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | detail extensive |
| IPv6 transit statistics | <p>Number of IPv6 transit bytes and packets received and transmitted on the physical interface if IPv6 statistics tracking is enabled.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface (which reflects its initialization sequence). | detail extensive none |

Table 29: Aggregated Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|------------------------|--|-----------------------|
| SNMP ifIndex | SNMP interface index number of the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| VLAN-Tag | The TPID and VLAD identifier. | All levels |
| Demux | IP demultiplexing (demux) value that appears if this interface is used as the demux underlying interface. The output is one of the following: <ul style="list-style-type: none"> ■ Source Family Inet ■ Destination Family Inet | detail extensive none |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Statistics | Information about the number of packets, packets per second, number of bytes, and bytes per second on this aggregate interface. <ul style="list-style-type: none"> ■ Bundle—Information about input and output bundle rates. ■ Link—(detail and extensive only) Information about specific links in the aggregate, including link state and input and output rates. ■ Marker Statistics—(detail and extensive only) Information about 802.3ad marker protocol statistics on the specified links. <ul style="list-style-type: none"> ■ Marker Rx—Number of valid marker PDUs received on this aggregation port. ■ Resp Tx—Number of marker response PDUs transmitted on this aggregation port. ■ Unknown Rx—Number of frames received that either carry the slow protocols Ethernet type value (43B.4) but contain an unknown protocol data unit (PDU), or are addressed to the slow protocols group MAC address (43B.3) but do not carry the slow protocols Ethernet type. ■ Illegal Rx—Number of frames received that carry the slow protocols Ethernet type value (43B.4) but contain a badly formed PDU or an illegal value of protocol subtype (43B.4). | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. Possible values are described in “Protocol Field” on page 92. | brief |
| Protocol | Protocol family configured on the logical interface. Possible values are described in “Protocol Field” on page 92. | detail extensive none |
| MTU | Maximum transmission unit size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |

Table 29: Aggregated Ethernet show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------|--|-----------------------|
| Mac-Validate Failures | Number of MAC address validation failures for packets and bytes. This field is displayed when MAC address validation is enabled for the logical interface. | detail extensive none |
| Addresses, Flags | Information about address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces ae0
(Aggregated Ethernet) Physical interface: ae0, Enabled, Physical link is Up
                        Interface index: 153, SNMP ifIndex: 59
                        Link-level type: Ethernet, MTU: 1514, Speed: 300mbps, Loopback: Disabled,
                        Source filtering: Disabled, Flow control: Disabled, Minimum links needed: 1
                        Device flags   : Present Running
                        Interface flags: SNMP-Traps 16384
                        Current address: 00:05:85:8b:bf:f0, Hardware address: 00:05:85:8b:bf:f0
                        Last flapped   : Never
                        Input rate     : 0 bps (0 pps)
                        Output rate    : 0 bps (0 pps)

                        Logical interface ae0.0 (Index 72) (SNMP ifIndex 60)
                        Flags: SNMP-Traps 16384 Encapsulation: ENET2
                        Statistics      Packets      pps      Bytes      bps
                        Bundle:
                        Input  :           0           0           0           0
                        Output:           0           0           0           0
                        Protocol inet, MTU: 1500
                        Flags: None
                        Addresses, Flags: Is-Preferred Is-Primary
                        Destination: 10.100.1/24, Local: 10.100.1.2, Broadcast: 10.100.1.255

```

```

show interfaces brief user@host> show interfaces ae0 brief
(Aggregated Ethernet) Physical interface: ae0, Enabled, Physical link is Up
                        Link-level type: Ethernet, MTU: 1514, Speed: 300mbps, Loopback: Disabled,
                        Source filtering: Disabled, Flow control: Disabled
                        Device flags   : Present Running
                        Interface flags: SNMP-Traps 16384

                        Logical interface ae0.0
                        Flags: SNMP-Traps 16384 Encapsulation: ENET2
                        inet 10.100.1.2/24

```

```

show interfaces detail user@host> show interfaces ae0 detail
(Aggregated Ethernet) Physical interface: ae0, Enabled, Physical link is Up
                        Interface index: 153, SNMP ifIndex: 59, Generation: 36
                        Link-level type: Ethernet, MTU: 1514, Speed: 300mbps, Loopback: Disabled,
                        Source filtering: Disabled, Flow control: Disabled, Minimum links needed: 1

```

```

Device flags   : Present Running
Interface flags: SNMP-Traps 16384
Current address: 00:05:85:8b:bf:f0, Hardware address: 00:05:85:8b:bf:f0
Last flapped   : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes :                0                0 bps
Output bytes :                0                0 bps
Input packets:                0                0 pps
Output packets:              0                0 pps
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort                7375                7375                0
1 expedited-fo                0                  0                0
2 assured-forw                0                  0                0
3 network-cont              2268                2268                0

Logical interface ae0.0 (Index 72) (SNMP ifIndex 60) (Generation 18)
Flags: SNMP-Traps 16384 Encapsulation: ENET2
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :          0          0          0          0
  Output:          0          0          0          0
Link:
  fe-0/1/0.0
    Input :          0          0          0          0
    Output:          0          0          0          0
  fe-0/1/2.0
    Input :          0          0          0          0
    Output:          0          0          0          0
  fe-0/1/3.0
    Input :          0          0          0          0
    Output:          0          0          0          0
Marker Statistics:  Marker Rx      Resp Tx      Unknown Rx      Illegal Rx
fe-0/1/0.0          0          0          0          0
fe-0/1/2.0          0          0          0          0
fe-0/1/3.0          0          0          0          0
Protocol inet, MTU: 1500, Generation: 37, Route table: 0
Flags: Is-Primary, Mac-Validate-Strict
Mac-Validate Failures: Packets: 0, Bytes: 0
Destination: 10.100.1/24, Local: 10.100.1.2, Broadcast: 10.100.1.255,
Generation: 49

```

**show interfaces
extensive
(Aggregated Ethernet)**

```

user@host> show interfaces ae0 extensive
Physical interface: ae0, Enabled, Physical link is Up
Interface index: 153, SNMP ifIndex: 59, Generation: 36
Link-level type: Ethernet, MTU: 1514, Speed: 300mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Disabled, Minimum links needed: 1
Device flags   : Present Running
Interface flags: SNMP-Traps 16384
Current address: 00:05:85:8b:bf:f0, Hardware address: 00:05:85:8b:bf:f0
Last flapped   : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes :                60                0 bps
Output bytes :                0                0 bps
Input packets:                1                0 pps

```



```

Output packets:                0                0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort                7375                7375                0
1 expedited-fo                0                  0                  0
2 assured-forw                0                  0                  0
3 network-cont               2268                2268                0

```

Logical interface ae0.0 (Index 72) (SNMP ifIndex 60) (Generation 18)

Flags: SNMP-Traps 16384 Encapsulation: ENET2

| Statistics | Packets | pps | Bytes | bps |
|------------|---------|-----|-------|-----|
|------------|---------|-----|-------|-----|

Bundle:

| | | | | |
|---------|---|---|----|---|
| Input : | 1 | 0 | 60 | 0 |
| Output: | 0 | 0 | 0 | 0 |

Link:

fe-0/1/0.0

| | | | | |
|---------|---|---|---|---|
| Input : | 0 | 0 | 0 | 0 |
| Output: | 0 | 0 | 0 | 0 |

fe-0/1/2.0

| | | | | |
|---------|---|---|---|---|
| Input : | 0 | 0 | 0 | 0 |
| Output: | 0 | 0 | 0 | 0 |

fe-0/1/3.0

| | | | | |
|---------|---|---|----|---|
| Input : | 1 | 0 | 60 | 0 |
| Output: | 0 | 0 | 0 | 0 |

| Marker Statistics: | Marker | Rx | Resp | Tx | Unknown | Rx | Illegal | Rx |
|--------------------|--------|----|------|----|---------|----|---------|----|
| fe-0/1/0.0 | | 0 | | 0 | | 0 | | 0 |
| fe-0/1/2.0 | | 0 | | 0 | | 0 | | 0 |
| fe-0/1/3.0 | | 0 | | 0 | | 0 | | 0 |

Protocol inet, MTU: 1500, Generation: 37, Route table: 0

Flags: None

Addresses, Flags: Is-Preferred Is-Primary

Destination: 10.100.1/24, Local: 10.100.1.2, Broadcast: 10.100.1.255,
Generation: 49

show interfaces
extensive (Aggregated
Ethernet with VLAN
Stacking)

```

user@host> show interfaces ae0 detail
Physical interface: ae0, Enabled, Physical link is Up
  Interface index: 155, SNMP ifIndex: 48, Generation: 186
  Link-level type: 52, MTU: 1518, Speed: 2000mbps, Loopback: Disabled, Source
  filtering: Disabled,
  Flow control: Disabled, Minimum links needed: 1, Minimum bandwidth needed: 0
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Current address: 00:12:1e:19:3f:f0, Hardware address: 00:12:1e:19:3f:f0
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :                2406875                40152 bps
    Output bytes :               1124470                22056 bps
    Input packets:                 5307                 5 pps
    Output packets:              13295                21 pps
  IPv6 transit statistics:
    Input bytes :                 0
    Output bytes :                 0
    Input packets:                 0
    Output packets:                0
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0, Policed discards:
  0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0, Resource errors:
  0
  Ingress queues: 4 supported, 4 in use
  Queue counters:      Queued packets  Transmitted packets      Dropped packets

    0 best-effort                0                859777                0
    1 expedited-fo                0                  0                0
    2 assured-forw                0                  0                0
    3 network-cont                0                  0                0

  Egress queues: 4 supported, 4 in use
  Queue counters:      Queued packets  Transmitted packets      Dropped packets

    0 best-effort                0            1897615                0
    1 expedited-fo                0                  0                0
    2 assured-forw                0                  0                0
    3 network-cont                0            662505                0

  Logical interface ae0.451 (Index 69) (SNMP ifIndex 167) (Generation 601)
  Flags: SNMP-Traps VLAN-Tag [ 0x8100.451 ] Encapsulation: VLAN-VPLS
  Statistics      Packets      pps      Bytes      bps
  Bundle:
    Input :          289          0        25685        376
    Output:         1698          4       130375       3096
  Link:
    ge-1/2/0.451
      Input :          289          0        25685        376
      Output:           0          0           0           0
    ge-1/2/1.451

```

```

      Input :          0          0          0          0
      Output:        1698          4        130375        3096
Marker Statistics:  Marker Rx      Resp Tx      Unknown Rx      Illegal Rx
ge-1/2/0.451             0             0             0             0
ge-1/2/1.451             0             0             0             0
Protocol vpls, MTU: 1518, Generation: 849, Route table: 3
Flags: Is-Primary

```

Logical interface ae0.452 (Index 70) (SNMP ifIndex 170) (Generation 602)

```

Flags: SNMP-Traps VLAN-Tag [ 0x8100.452 ] Encapsulation: VLAN-VPLS
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :        293          1        26003        1072
  Output:       1694          3       130057        2400
Link:
ge-1/2/0.452
  Input :        293          1        26003        1072
  Output:       1694          3       130057        2400
ge-1/2/1.452
  Input :          0          0          0          0
  Output:          0          0          0          0
Marker Statistics:  Marker Rx      Resp Tx      Unknown Rx      Illegal Rx
ge-1/2/0.452             0             0             0             0
ge-1/2/1.452             0             0             0             0
Protocol vpls, MTU: 1518, Generation: 850, Route table: 3
Flags: None

```

...

show interfaces (far-end-interval)

| | |
|--|---|
| Syntax | show interfaces far-end-interval <i>interface-fpc/pic/port</i> |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On channelized interfaces, to display the far end interval data for the specified interface, use the run show interfaces far-end-interval <i>interface-fpc/pic/port</i> command. |
| Required Privilege Level | view |
| show interfaces far-end-interval coc12-0/0/0 | <pre> user@host> run show interfaces far-end-interval coc12-0/0/0 Physical interface: coc12-5/2/0, SNMP ifIndex: 121 05:30-current: ES-L: 1, SES-L: 1, UAS-L: 0 05:15-05:30: ES-L: 0, SES-L: 0, UAS-L: 0 05:00-05:15: ES-L: 0, SES-L: 0, UAS-L: 0 04:45-05:00: ES-L: 0, SES-L: 0, UAS-L: 0 04:30-04:45: ES-L: 0, SES-L: 0, UAS-L: 0 04:15-04:30: ES-L: 0, SES-L: 0, UAS-L: 0 04:00-04:15: ... </pre> |
| show interfaces far-end-interval coc1-5/2/1:1 | <pre> user@host> run show interfaces far-end-interval coc1-5/2/1:1 Physical interface: coc1-5/2/1:1, SNMP ifIndex: 342 05:30-current: ES-L: 1, SES-L: 1, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0 05:15-05:30: ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0 05:00-05:15: ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0 04:45-05:00: ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0 04:30-04:45: ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0 04:15-04:30: ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0 04:00-04:15: ... </pre> |

show interfaces (Fast Ethernet)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified Fast Ethernet interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the interface type is <i>fe-fpc/pic/port</i>. On the J-series routing platform, the interface type is <i>fe-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Fast Ethernet) on page 134</p> <p>show interfaces brief (Fast Ethernet) on page 135</p> <p>show interfaces detail (Fast Ethernet) on page 135</p> <p>show interfaces extensive (Fast Ethernet) on page 135</p> |
| Output Fields | Table 30 on page 121 lists the output fields for the show interfaces (Fast Ethernet and Gigabit Ethernet) command. Output fields are listed in the approximate order in which they appear. |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Index number of the physical interface, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | Maximum transmission unit size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Loopback status: Enabled or Disabled . If loopback is enabled, type of loopback: Local or Remote . | All levels |
| Source filtering | Source filtering status: Enabled or Disabled . | All levels |
| LAN-PHY mode | 10-Gigabit Ethernet interface operating in Local Area Network Physical Layer Device (LAN PHY) mode. LAN PHY allows 10-Gigabit Ethernet wide area links to use existing Ethernet applications. | All levels |
| WAN-PHY mode | 10-Gigabit Ethernet interface operating in Wide Area Network Physical Layer Device (WAN PHY) mode. WAN PHY allows 10-Gigabit Ethernet wide area links to use fiber-optic cables and other devices intended for SONET/SDH. | All levels |
| Unidirectional | Unidirectional link mode status for 10-Gigabit Ethernet interface: Enabled or Disabled for parent interface; Rx-only or Tx-only for child interfaces. | All levels |
| Flow control | Flow control status: Enabled or Disabled . | All levels |
| Auto-negotiation | (Gigabit Ethernet interfaces) Autonegotiation status: Enabled or Disabled . | All levels |
| Remote-fault | (Gigabit Ethernet interfaces) Remote fault status: <ul style="list-style-type: none"> ■ Online—Autonegotiation is manually configured as online. ■ Offline—Autonegotiation is manually configured as offline. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Wavelength | (10-Gigabit Ethernet dense wavelength-division multiplexing [DWDM] interfaces) Displays the configured wavelength, in nanometers (nm). | All levels |
| Frequency | (10-Gigabit Ethernet DWDM interfaces only) Displays the frequency associated with the configured wavelength, in terahertz (THz). | All levels |
| CoS queues | Number of CoS queues configured. | detail extensive none |
| Schedulers | (Gigabit Ethernet only) Number of CoS schedulers configured. | extensive |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | Hardware MAC address. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second:timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive none |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. <p>Gigabit Ethernet and 10-Gigabit Ethernet IQ PICs count the overhead and CRC bytes.</p> <p>For Gigabit Ethernet IQ PICs, the input byte counts vary by interface type. For more information, see Table 31 on page 144.</p> | detail extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------|--|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. L3 incomplete errors can be ignored by configuring the <code>ignore-l3-incompletes</code> statement. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ FIFO errors—Number of FIFO errors in the receive direction that are reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning. ■ Resource errors—Sum of transmit drops. | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------|--|------------------|
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Collisions—Number of Ethernet collisions. The Gigabit Ethernet PIC supports only full-duplex operation, so for Gigabit Ethernet PICs, this number should always remain 0. If it is nonzero, there is a software bug. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ FIFO errors—Number of FIFO errors in the send direction as reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters (Egress) | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| Ingress queues | Total number of ingress queues supported on the specified interface. Displayed on IQ2 interfaces. | extensive |
| Queue counters (Ingress) | <p>CoS queue number and its associated user-configured forwarding class name. Displayed on IQ2 interfaces.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------------------|---|-----------------------|
| Active alarms and Active defects | <p>Ethernet-specific defects that can prevent the interface from passing packets. When a defect persists for a certain amount of time, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. These fields can contain the value None or Link.</p> <ul style="list-style-type: none"> ■ None—There are no active defects or alarms. ■ Link—Interface has lost its link state, which usually means that the cable is unplugged, the far-end system has been turned off, or the PIC is malfunctioning. | detail extensive none |
| OTN FEC statistics | <p>The forward error correction (FEC) counters. The counters are read directly from the Xenpak module. The numbers are calculated inside the Xenpak hardware.</p> <ul style="list-style-type: none"> ■ Corrected Errors—The count of corrected errors in the last second. ■ Corrected Error Ratio—The corrected error ratio in the last 25 seconds. For example, 1e-7 is 1 error per 10 million bits. | |
| PCS statistics | <p>(10-Gigabit Ethernet interfaces) Displays Physical Coding Sublayer (PCS) fault conditions from the WAN PHY or the LAN PHY device.</p> <ul style="list-style-type: none"> ■ Bit errors—High bit error rate. Indicates the number of bit errors when the PCS receiver is operating in normal mode. ■ Errored blocks—Loss of block lock. The number of errored blocks when PCS receiver is operating in normal mode. | detail extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|----------------|---|-----------------|
| MAC statistics | <p>Receive and Transmit statistics reported by the PIC's MAC subsystem, including the following:</p> <ul style="list-style-type: none"> ■ Total octets and total packets—Total number of octets and packets. For Gigabit Ethernet IQ PICs, the received octets count varies by interface type. For more information, see Table 31 on page 144. ■ Unicast packets, Broadcast packets, and Multicast packets—Number of unicast, broadcast, and multicast packets. ■ CRC/Align errors—Total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, and had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error). ■ FIFO error—Number of FIFO errors that are reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning. ■ MAC control frames—Number of MAC control frames. ■ MAC pause frames—Number of MAC control frames with pause operational code. ■ Oversized frames—Number of frames that exceed 1518 octets. ■ Jabber frames—Number of frames that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. This definition of jabber is different from the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition in which any packet exceeds 20 ms. The allowed range to detect jabber is from 20 ms to 150 ms. ■ Fragment frames—Total number of packets that were less than 64 octets in length (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. Fragment frames normally increment because both runs (which are normal occurrences caused by collisions) and noise hits are counted. ■ VLAN tagged frames—Number of frames that are VLAN tagged. The system uses the TPID of 0x8100 in the frame to determine whether a frame is tagged or not. ■ Code violations—Number of times an event caused the PHY to indicate “Data reception error” or “invalid data symbol error.” | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------|--|-----------------|
| Filter statistics | <p>Receive and Transmit statistics reported by the PIC's MAC address filter subsystem. The filtering is done by the content-addressable memory (CAM) on the PIC. The filter examines a packet's source and destination MAC addresses to determine whether the packet should enter the system or be rejected.</p> <ul style="list-style-type: none"> ■ Input packet count—Number of packets received from the MAC hardware that the filter processed. ■ Input packet rejects—Number of packets that the filter rejected because of either the source MAC address or the destination MAC address. ■ Input DA rejects—Number of packets that the filter rejected because the destination MAC address of the packet is not on the accept list. It is normal for this value to increment. When it increments very quickly and no traffic is entering the router from the far-end system, either there is a bad ARP entry on the far-end system, or multicast routing is not on and the far-end system is sending many multicast packets to the local router (which the router is rejecting). ■ Input SA rejects—Number of packets that the filter rejected because the source MAC address of the packet is not on the accept list. The value in this field should increment only if source MAC address filtering has been enabled. If filtering is enabled, if the value increments quickly, and if the system is not receiving traffic that it should from the far-end system, it means that the user-configured source MAC addresses for this interface are incorrect. ■ Output packet count—Number of packets that the filter has given to the MAC hardware. ■ Output packet pad count—Number of packets the filter padded to the minimum Ethernet size (60 bytes) before giving the packet to the MAC hardware. Usually, padding is done only on small ARP packets, but some very small IP packets can also require padding. If this value increments rapidly, either the system is trying to find an ARP entry for a far-end system that does not exist or it is misconfigured. ■ Output packet error count—Number of packets with an indicated error that the filter was given to transmit. These packets are usually aged packets or are the result of a bandwidth problem on the FPC hardware. On a normal system, the value of this field should not increment. ■ CAM destination filters, CAM source filters—Number of entries in the CAM dedicated to destination and source MAC address filters. There can only be up to 64 source entries. If source filtering is disabled, which is the default, the values for these fields should be 0. | extensive |
| PMA PHY | <p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. Any state other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PHY Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------|--|-----------------|
| WIS section | <p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. Any state other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B1—Bit interleaved parity for SONET section overhead ■ SEF—Severely errored framing ■ LOL—Loss of light ■ LOF—Loss of frame ■ ES-S—Errored seconds (section) ■ SES-S—Severely errored seconds (section) ■ SEFS-S—Severely errored framing seconds (section) | extensive |
| WIS line | <p>(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B2—Bit interleaved parity for SONET line overhead ■ REI-L—Remote error indication (near-end line) ■ RDI-L—Remote defect indication (near-end line) ■ AIS-L—Alarm indication signal (near-end line) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ ES-L—Errored seconds (near-end line) ■ SES-L—Severely errored seconds (near-end line) ■ UAS-L—Unavailable seconds (near-end line) ■ ES-LFE—Errored seconds (far-end line) ■ SES-LFE—Severely errored seconds (far-end line) ■ UAS-LFE—Unavailable seconds (far-end line) | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------|--|-----------------|
| WIS path | <p>(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. Any state other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B3—Bit interleaved parity for SONET section overhead ■ REI-P—Remote error indication ■ LOP-P—Loss of pointer (path) ■ AIS-P—Path alarm indication signal ■ RDI-P—Path remote defect indication ■ UNEQ-P—Path unequipped ■ PLMP—Path payload label mismatch ■ ES-P—Errored seconds (near-end STS path) ■ SES-P—Severely errored seconds (near-end STS path) ■ UAS-P—Unavailable seconds (near-end STS path) ■ SES-PFE—Severely errored seconds (far-end STS path) ■ UAS-PFE—Unavailable seconds (far-end STS path) | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---|--|-----------------|
| Autonegotiation information | <p>Information about link autonegotiation.</p> <ul style="list-style-type: none"> ■ Negotiation status: <ul style="list-style-type: none"> ■ Incomplete—Ethernet interface has the speed or link mode configured. ■ No autonegotiation—Remote Ethernet interface has the speed or link mode configured, or does not perform autonegotiation. ■ Complete—Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process is successful. ■ Link partner status—OK when Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process is successful. ■ Link partner: <ul style="list-style-type: none"> ■ Link mode—Depending on the capability of the attached Ethernet device, either Full-duplex or Half-duplex. ■ Flow control—Types of flow control supported by the remote Ethernet device. For Fast Ethernet interfaces, the type is None. For Gigabit Ethernet interfaces, types are Symmetric (link partner supports PAUSE on receive and transmit), Asymmetric (link partner supports PAUSE on transmit), and Symmetric/Asymmetric (link partner supports both PAUSE on receive and transmit or only PAUSE receive). ■ Remote fault—Remote fault information from the link partner—Failure indicates a receive link error. OK indicates that the link partner is receiving. Negotiation error indicates a negotiation error. Offline indicates that the link partner is going offline. ■ Local resolution—Information from the link partner: <ul style="list-style-type: none"> ■ Flow control—Types of flow control supported by the remote Ethernet device. For Gigabit Ethernet interfaces, types are Symmetric (link partner supports PAUSE on receive and transmit), Asymmetric (link partner supports PAUSE on transmit), and Symmetric/Asymmetric (link partner supports both PAUSE on receive and transmit or only PAUSE receive). ■ Remote fault—Remote fault information. Link OK (no error detected on receive), Offline (local interface is offline), and Link Failure (link error detected on receive). | extensive |
| Received path trace, Transmitted path trace | <p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET/SDH interfaces allow path trace bytes to be sent inband across the SONET/SDH link. Juniper Networks and other router manufacturers use these bytes to help diagnose misconfigurations and network errors by setting the transmitted path trace message so that it contains the system hostname and name of the physical interface. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits.</p> | extensive |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ —Queue number and its associated user-configured forwarding class name. ■ Bandwidth %—Percentage of bandwidth allocated to the queue. ■ Bandwidth bps—Bandwidth allocated to the queue (in bps). ■ Buffer %—Percentage of buffer space allocated to the queue. ■ Buffer usec—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: <code>low</code> or <code>high</code>. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are <code>none</code> and <code>exact</code>. If <code>exact</code> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <code>none</code> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP interface index number for the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|--------------------------------|
| VLAN-Tag | <p>Rewrite profile applied to incoming or outgoing frames on the outer (Out) VLAN tag or for both the outer and inner (In) VLAN tags.</p> <ul style="list-style-type: none"> ■ push—An outer VLAN tag is pushed in front of the existing VLAN tag. ■ pop—The outer VLAN tag of the incoming frame is removed. ■ swap—The outer VLAN tag of the incoming frame is overwritten with the user specified VLAN tag information. ■ push—An outer VLAN tag is pushed in front of the existing VLAN tag. ■ push-push—Two VLAN tags are pushed in from the incoming frame. ■ swap-push—The outer VLAN tag of the incoming frame is replaced by a user-specified VLAN tag value. A user-specified outer VLAN tag is pushed in front. The outer tag becomes an inner tag in the final frame. ■ swap-swap—Both the inner and the outer VLAN tags of the incoming frame are replaced by the user specified VLAN tag value. ■ pop-swap—The outer VLAN tag of the incoming frame is removed, and the inner VLAN tag of the incoming frame is replaced by the user-specified VLAN tag value. The inner tag becomes the outer tag in the final frame. ■ pop-pop—Both the outer and inner VLAN tags of the incoming frame are removed. | brief detail extensive none |
| Demux: | <p>IP demultiplexing (demux) value that appears if this interface is used as the demux underlying interface. The output is one of the following:</p> <ul style="list-style-type: none"> ■ Source Family Inet ■ Destination Family Inet | detail extensive none |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Protocol | Protocol family. Possible values are described in “Protocol Field” on page 92. | detail extensive none |
| MTU | Maximum transmission unit size on the logical interface. | detail extensive none |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the specified interface set.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface set ■ Input packets, Output packets—Number of packets received and transmitted on the interface set. | detail extensive |
| IPv6 transit statistics | Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled. | extensive |
| Local statistics | Number and rate of bytes and packets destined to the router. | extensive |
| Transit statistics | Number and rate of bytes and packets transiting the switch. | extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Route table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive none |

Table 30: Fast Ethernet and Gigabit Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Flags | Information about protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive |
| Donor interface | (Unnumbered Ethernet) Interface from which an unnumbered Ethernet interface borrows an IPv4 address. | detail extensive none |
| Preferred source address | (Unnumbered Ethernet) Secondary IPv4 address of the donor loopback interface that acts as the preferred source address for the unnumbered Ethernet interface. | detail extensive none |
| Input Filters | Names of any input filters applied to this interface. If you specify a precedence value for any filter in a dynamic profile, filter precedence values appear in parenthesis next to all interfaces. | detail extensive |
| Output Filters | Names of any output filters applied to this interface. If you specify a precedence value for any filter in a dynamic profile, filter precedence values appear in parenthesis next to all interfaces. | detail extensive |
| Mac-Validate Failures | Number of MAC address validation failures for packets and bytes. This field is displayed when MAC address validation is enabled for the logical interface. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is inet, the IP address of the interface is also displayed. | brief |
| Flags | Information about address flag (possible values are described in “Addresses, Flags” on page 88). | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces fe-0/0/0
(Fast Ethernet)    Physical interface: fe-0/0/0, Enabled, Physical link is Up
                      Interface index: 128, SNMP ifIndex: 22
                      Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
                      Source filtering: Disabled, Flow control: Enabled
                      Device flags   : Present Running
                      Interface flags: SNMP-Traps Internal: 0x4000
                      CoS queues    : 4 supported, 4 maximum usable queues
                      Current address: 00:05:85:02:38:00, Hardware address: 00:05:85:02:38:00
                      Last flapped  : 2006-01-20 14:50:58 PST (2w4d 00:44 ago)
                      Input rate    : 0 bps (0 pps)
                      Output rate   : 0 bps (0 pps)
                      Active alarms  : None
                      Active defects : None
                      Logical interface fe-0/0/0.0 (Index 66) (SNMP ifIndex 198)
                      Flags: SNMP-Traps Encapsulation: ENET2

```

```

Protocol inet, MTU: 1500
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.10.10/24, Local: 10.10.10.1, Broadcast: 10.10.10.255

```

**show interfaces brief
(Fast Ethernet)**

```

user@host> show interfaces fe-0/0/0 brief
Physical interface: fe-0/0/0, Enabled, Physical link is Up
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Logical interface fe-0/0/0.0
Flags: SNMP-Traps Encapsulation: ENET2
inet 10.10.10.1/24

```

**show interfaces detail
(Fast Ethernet)**

```

user@host> show interfaces fe-0/0/0 detail
Physical interface: fe-0/0/0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 22, Generation: 5391
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:02:38:00, Hardware address: 00:05:85:02:38:00
Last flapped   : 2006-01-20 14:50:58 PST (2w4d 00:45 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   :                0                0 bps
Output bytes  :                42                0 bps
Input packets :                0                0 pps
Output packets:                1                0 pps
Active alarms : None
Active defects: None
Logical interface fe-0/0/0.0 (Index 66) (SNMP ifIndex 198) (Generation 67)
Flags: SNMP-Traps Encapsulation: ENET2
Protocol inet, MTU: 1500, Generation: 105, Route table: 0
Flags: Is-Primary, Mac-Validate-Strict
Mac-Validate Failures: Packets: 0, Bytes: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.10.10/24, Local: 10.10.10.1, Broadcast: 10.10.10.255,
Generation: 136

```

**show interfaces
extensive
(Fast Ethernet)**

```

user@host> show interfaces fe-0/0/0 extensive
Physical interface: fe-0/0/0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 22, Generation: 5391
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:02:38:00, Hardware address: 00:05:85:02:38:00
Last flapped   : 2006-01-20 14:50:58 PST (2w4d 00:46 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   :                0                0 bps
Output bytes  :                42                0 bps
Input packets :                0                0 pps
Output packets:                1                0 pps
Input errors:

```

```

Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0,
L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
FIFO errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 3, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,

  FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
Active alarms : None
Active defects : None
MAC statistics:
  Total octets          Receive      Transmit
  Total packets         0           1
  Unicast packets       0           0
  Broadcast packets     0           1
  Multicast packets     0           0
  CRC/Align errors     0           0
  FIFO errors           0           0
  MAC control frames    0           0
  MAC pause frames      0           0
  Oversized frames      0
  Jabber frames         0
  Fragment frames       0
  VLAN tagged frames    0
  Code violations        0
Filter statistics:
  Input packet count    0
  Input packet rejects  0
  Input DA rejects      0
  Input SA rejects      0
  Output packet count   1
  Output packet pad count 0
  Output packet error count 0
  CAM destination filters: 1, CAM source filters: 0
Autonegotiation information:
  Negotiation status: Complete
  Link partner:
    Link partner: Full-duplex, Flow control: None, Remote fault: Ok
  Local resolution:
Packet Forwarding Engine configuration:
  Destination slot: 0
    Bandwidth      Buffer Priority  Limit
                   %      bps    %      usec
  0 best-effort    95     950000000  95      0    low  none
  3 network-control 5     500000000  5      0    low  none
Logical interface fe-0/0/0.0 (Index 66) (SNMP ifIndex 198) (Generation 67)
Flags: SNMP-Traps Encapsulation: ENET2
Protocol inet, MTU: 1500, Generation: 105, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.10.10/24, Local: 10.10.10.1, Broadcast: 10.10.10.255,
  Generation: 136

```

show interfaces (Gigabit Ethernet)

| | |
|---|--|
| Syntax | show interfaces <i>ge-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series, T-series, and MX-series routing platforms only) Display status information about the specified Gigabit Ethernet interface. |
| Options | <p><i>ge-fpc/pic/port</i>—Display standard information about the specified Gigabit Ethernet interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Gigabit Ethernet) on page 137</p> <p>show interfaces brief (Gigabit Ethernet) on page 138</p> <p>show interfaces detail (Gigabit Ethernet) on page 138</p> <p>show interfaces extensive (Gigabit Ethernet IQ2) on page 140</p> <p>show interfaces (Gigabit Ethernet Unnumbered Interface) on page 142</p> |
| Output Fields | See Table 30 on page 121 for the output fields for the show interfaces (Fast Ethernet and Gigabit Ethernet) command. For Gigabit Ethernet IQ and IQE PICs, the traffic and MAC statistics vary by interface type. For more information, see Table 31 on page 144. |
| show interfaces (Gigabit Ethernet) | <pre> user@host> show interfaces ge-3/0/2 Physical interface: ge-3/0/2, Enabled, Physical link is Up Interface index: 167, SNMP ifIndex: 35 Link-level type: 52, MTU: 1522, Speed: 1000mbps, Loopback: Disabled, Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled Remote fault: Online Device flags : Present Running Interface flags: SNMP-Traps Internal: 0x4000 CoS queues : 4 supported, 4 maximum usable queues Current address: 00:05:85:4a:e9:7c, Hardware address: 00:05:85:4a:e9:7c Last flapped : 2006-08-10 17:25:10 PDT (00:01:08 ago) Input rate : 0 bps (0 pps) Output rate : 0 bps (0 pps) </pre> |

```

Ingress rate at Packet Forwarding Engine      : 0 bps (0 pps)
Ingress drop rate at Packet Forwarding Engine : 0 bps (0 pps)
Active alarms      : None
Active defects     : None

Logical interface ge-3/0/2.0 (Index 72) (SNMP ifIndex 69)
  Flags: SNMP-Traps 0x4000
  VLAN-Tag [ 0x8100.512 0x8100.513 ] In(pop-swap 0x8100.530) Out(swap-push
0x8100.512 0x8100.513)
  Encapsulation: VLAN-CCC
  Input packets : 0
  Output packets: 0
  Protocol ccc, MTU: 1522
  Flags: Is-Primary

```

show interfaces brief
(Gigabit Ethernet)

```

user@host> show interfaces ge-3/0/2 brief
Physical interface: ge-3/0/2, Enabled, Physical link is Up
Link-level type: 52, MTU: 1522, Speed: 1000mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
Remote fault: Online
Device flags      : Present Running
Interface flags:  SNMP-Traps Internal: 0x4000
Link flags        : None

Logical interface ge-3/0/2.0
  Flags: SNMP-Traps 0x4000
  VLAN-Tag [ 0x8100.512 0x8100.513 ] In(pop-swap 0x8100.530) Out(swap-push
0x8100.512 0x8100.513)
  Encapsulation: VLAN-CCC
  ccc

Logical interface ge-3/0/2.32767
  Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x0000.0 ] Encapsulation: ENET2

```

show interfaces detail
(Gigabit Ethernet)

```

user@host> show interfaces ge-3/0/2 detail
Physical interface: ge-3/0/2, Enabled, Physical link is Up
Interface index: 167, SNMP ifIndex: 35, Generation: 177
Link-level type: 52, MTU: 1522, Speed: 1000mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
Remote fault: Online
Device flags      : Present Running
Interface flags:  SNMP-Traps Internal: 0x4000
Link flags        : None
CoS queues        : 4 supported, 4 maximum usable queues
Hold-times        : Up 0 ms, Down 0 ms
Current address: 00:05:85:4a:e9:7c, Hardware address: 00:05:85:4a:e9:7c
Last flapped      : 2006-08-09 17:17:00 PDT (01:31:33 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes      : 0                      0 bps
  Output bytes     : 0                      0 bps
  Input packets    : 0                      0 pps
  Output packets   : 0                      0 pps
Ingress traffic statistics at Packet Forwarding Engine:
  Input bytes      : 0                      0 bps
  Input packets    : 0                      0 pps
  Drop bytes       : 0                      0 bps
  Drop packets     : 0                      0 pps
Ingress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

```

| | | | |
|----------------|---|---|---|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 0 | 0 | 0 |

Egress queues: 4 supported, 4 in use

| Queue counters: | Queued packets | Transmitted packets | Dropped packets |
|-----------------|----------------|---------------------|-----------------|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 0 | 0 | 0 |

Active alarms : None
Active defects : None

Logical interface ge-3/0/2.0 (Index 72) (SNMP ifIndex 69) (Generation 140)

Flags: SNMP-Traps 0x4000

VLAN-Tag [0x8100.512 0x8100.513] In(pop-swap 0x8100.530)

Out(swap-push 0x8100.512 0x8100.513)

Encapsulation: VLAN-CCC

Traffic statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Local statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Transit statistics:

Input bytes : 0 0 bps

Output bytes : 0 0 bps

Input packets: 0 0 pps

Output packets: 0 0 pps

Protocol ccc, MTU: 1522, Generation: 149, Route table: 0

Flags: Is-Primary

Logical interface ge-3/0/2.32767 (Index 71) (SNMP ifIndex 70)

(Generation 139)

Flags: SNMP-Traps 0x4000 VLAN-Tag [0x0000.0] Encapsulation: ENET2

Traffic statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Local statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Transit statistics:

Input bytes : 0 0 bps

Output bytes : 0 0 bps

```

Input packets:          0          0 pps
Output packets:         0          0 pps

```

**show interfaces
extensive
(Gigabit Ethernet IQ2)**

```

user@host> show interfaces extensive ge-7/1/3
Physical interface: ge-7/1/3, Enabled, Physical link is Up
Interface index: 170, SNMP ifIndex: 70, Generation: 171
Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
Remote fault: Online
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4004000
Link flags     : None
CoS queues     : 8 supported, 4 maximum usable queues
Schedulers    : 256
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:14:f6:30:5e:74, Hardware address: 00:14:f6:30:5e:74
Last flapped   : 2007-11-07 21:31:41 PST (02:03:33 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :          38910844056          7952 bps
Output bytes :           7174605          8464 bps
Input packets:         418398473           11 pps
Output packets:          78903           12 pps
IPv6 transit statistics:
Input bytes :          0
Output bytes :          0
Input packets:          0
Output packets:          0
Ingress traffic statistics at Packet Forwarding Engine:
Input bytes :         38910799145          7952 bps
Input packets:         418397956           11 pps
Drop bytes :          0           0 bps
Drop packets:          0           0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0,
L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
FIFO errors: 0, Resource errors: 0
Output errors:
Carrier transitions: 1, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,

FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
Ingress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort          418390823          418390823              0

1 expedited-fo           0              0              0

2 assured-forw           0              0              0

3 network-cont          7133           7133              0

Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort          1031           1031              0

1 expedited-fo           0              0              0

2 assured-forw           0              0              0

```



```

3 network-cont                77872                77872                0

Active alarms : None
Active defects : None
MAC statistics:
    Receive          Transmit
Total octets        38910844056        7174605
Total packets       418398473         78903
Unicast packets     408021893366         1026
Broadcast packets          10          12
Multicast packets    418398217        77865
CRC/Align errors          0           0
FIFO errors           0           0
MAC control frames     0           0
MAC pause frames       0           0
Oversized frames      0
Jabber frames          0
Fragment frames       0
VLAN tagged frames    0
Code violations        0
Filter statistics:
Input packet count    418398473
Input packet rejects  479
Input DA rejects      479
Input SA rejects      0
Output packet count          78903
Output packet pad count      0
Output packet error count    0
CAM destination filters: 0, CAM source filters: 0
Autonegotiation information:
Negotiation status: Complete
Link partner:
    Link mode: Full-duplex, Flow control: Symmetric/Asymmetric,
    Remote fault: OK
Local resolution:
    Flow control: Symmetric, Remote fault: Link OK
Packet Forwarding Engine configuration:
Destination slot: 7
Direction : Output
CoS transmit queue      Bandwidth      Buffer      Priority      Limit
                        %      bps      %      usec
0 best-effort           95      950000000  95          0
low  none
3 network-control       5       50000000  5           0
low  none
Direction : Input
CoS transmit queue      Bandwidth      Buffer      Priority      Limit
                        %      bps      %      usec
0 best-effort           95      950000000  95          0
low  none
3 network-control       5       50000000  5           0
low  none

Logical interface ge-7/1/3.0 (Index 70) (SNMP ifIndex 85) (Generation 150)
Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
Input bytes :          812400
Output bytes :         1349206
Input packets:          9429
Output packets:         9449
IPv6 transit statistics:
Input bytes :          0

```

```

Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 812400
Output bytes : 1349206
Input packets: 9429
Output packets: 9449
Transit statistics:
Input bytes : 0 7440 bps
Output bytes : 0 7888 bps
Input packets: 0 10 pps
Output packets: 0 11 pps
IPv6 transit statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Protocol inet, MTU: 1500, Generation: 169, Route table: 0
Flags: Is-Primary, Mac-Validate-Strict
Mac-Validate Failures: Packets: 0, Bytes: 0
Addresses, Flags: Is-Preferred Is-Primary
Input Filters: F1-ge-3/0/1.0-in, F3-ge-3/0/1.0-in
Output Filters: F2-ge-3/0/1.0-out (53)
Destination: 10.74.2/24, Local: 10.74.2.2, Broadcast: 10.74.2.255,
Generation: 196
Protocol multiservice, MTU: Unlimited, Generation: 170, Route table: 0
Flags: Is-Primary
Policer: Input: __default_arp_policer__

```

show interfaces
(Gigabit Ethernet
Unnumbered Interface)

```

user@host> show interfaces ge-3/2/0
Physical interface: ge-3/2/0, Enabled, Physical link is Up
Interface index: 148, SNMP ifIndex: 50
Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
Remote fault: Online
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags : None
CoS queues : 8 supported, 4 maximum usable queues
Current address: 00:14:f6:11:26:f8, Hardware address: 00:14:f6:11:26:f8
Last flapped : 2006-10-27 04:42:23 PDT (08:01:52 ago)
Input rate : 0 bps (0 pps)
Output rate : 624 bps (1 pps)
Active alarms : None
Active defects : None

Logical interface ge-3/2/0.0 (Index 67) (SNMP ifIndex 85)
Flags: SNMP-Traps Encapsulation: ENET2
Input packets : 0
Output packets: 6
Protocol inet, MTU: 1500
Flags: Unnumbered
Donor interface: lo0.0 (Index 64)
Preferred source address: 22.22.22.22

```

show interfaces (10-Gigabit Ethernet)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>xe-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced in JUNOS Release 8.0. |
| Description | (M-320, M-120, MX-series, and T-series routing platforms only) Display status information about the specified 10-Gigabit Ethernet interface. |
| Options | <p><i>xe-fpc/pic/port</i>—Display standard information about the specified 10-Gigabit Ethernet interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, IQ2) on page 144</p> <p>show interfaces extensive (10-Gigabit Ethernet, WAN PHY Mode) on page 147</p> <p>show interfaces extensive (10-Gigabit Ethernet, FEC) on page 148</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode) on page 149</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Transmit-Only) on page 149</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Receive-Only) on page 150</p> |
| Output Fields | See Table 30 on page 121 for the output fields for the show interfaces (Fast Ethernet and Gigabit Ethernet) command. |

For Gigabit Ethernet IQ PICs, traffic and MAC statistics output varies. Table 31 on page 144 describes the traffic and MAC statistics for two sample interfaces, each of which is sending traffic in packets of 500 bytes (including 478 bytes for the Layer 3 packet, 18 bytes for the Layer 2 VLAN traffic header, and 4 bytes for cyclic redundancy check [CRC] information). In Table 31 on page 144, the **ge-0/3/0** interface is the inbound physical interface, and the **ge-0/0/0** interface is the outbound physical interface. On both interfaces, traffic is carried on logical unit .50 (VLAN 50).

Table 31: Gigabit Ethernet IQ PIC Traffic and MAC Statistics by Interface Type

| Interface Type | Sample Command | Byte and Octet Counts Include | Comments |
|-----------------------------|--|---|---|
| Inbound physical interface | <code>show interfaces ge-0/3/0 extensive</code> | Traffic statistics: Input bytes: 496 bytes per packet, representing the Layer 2 packet MAC statistics: Received octets: 500 bytes per packet, representing the Layer 2 packet + 4 bytes | The additional 4 bytes are for the CRC. |
| Inbound logical interface | <code>show interfaces ge-0/3/0.50 extensive</code> | Traffic statistics: Input bytes: 478 bytes per packet, representing the Layer 3 packet | |
| Outbound physical interface | <code>show interfaces ge-0/0/0 extensive</code> | Traffic statistics: Input bytes: 490 bytes per packet, representing the Layer 3 packet + 12 bytes MAC statistics: Received octets: 478 bytes per packet, representing the Layer 3 packet | For input bytes, the additional 12 bytes includes 6 bytes for the destination MAC address + 4 bytes for VLAN + 2 bytes for the Ethernet type. |
| Outbound logical interface | <code>show interfaces ge-0/0/0.50 extensive</code> | Traffic statistics: Input bytes: 478 bytes per packet, representing the Layer 3 packet | |

```

show interfaces extensive
(10-Gigabit Ethernet, LAN PHY Mode, IQ2)
user@host> show interfaces xe-5/0/0 extensive
Physical interface: xe-5/0/0, Enabled, Physical link is Up
  Interface index: 177, SNMP ifIndex: 99, Generation: 178
  Link-level type: Ethernet, MTU: 1518, LAN-PHY mode, Speed: 10Gbps, Loopback:
  None, Source filtering: Enabled,
  Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None
  CoS queues     : 8 supported, 4 maximum usable queues
  Schedulers     : 1024
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:14:f6:b9:f1:f6, Hardware address: 00:14:f6:b9:f1:f6
  Last flapped   : Never

```

```

Statistics last cleared: Never
Traffic statistics:
  Input bytes :          6970332384          0 bps
  Output bytes :              0          0 bps
  Input packets:          81050506          0 pps
  Output packets:              0          0 pps
IPv6 transit statistics:
  Input bytes :              0
  Output bytes :              0
  Input packets:              0
  Output packets:              0
Ingress traffic statistics at Packet Forwarding Engine:
  Input bytes :          6970299398          0 bps
  Input packets:          81049992          0 pps
  Drop bytes :              0          0 bps
  Drop packets:              0          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3
incompletes: 0, L2 channel errors: 0,
  L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,
FIFO errors: 0, HS link CRC errors: 0,
  MTU errors: 0, Resource errors: 0
Ingress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort          81049992          81049992          0
  1 expedited-fo              0              0          0
  2 assured-forw              0              0          0
  3 network-cont              0              0          0

Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort              0              0          0
  1 expedited-fo              0              0          0
  2 assured-forw              0              0          0
  3 network-cont              0              0          0

Active alarms : None
Active defects : None
PCS statistics
  Bit errors          0
  Errored blocks      0
MAC statistics:
  Total octets          6970332384          0
  Total packets          81050506          0
  Unicast packets          81050000          0
  Broadcast packets          506          0
  Multicast packets          0          0
  CRC/Align errors          0          0
  FIFO errors              0          0
  MAC control frames          0          0
  MAC pause frames          0          0

```

```

Oversized frames                0
Jabber frames                   0
Fragment frames                 0
VLAN tagged frames              0
Code violations                  0
Filter statistics:
  Input packet count             81050506
  Input packet rejects           506
  Input DA rejects               0
  Input SA rejects               0
  Output packet count            0
  Output packet pad count        0
  Output packet error count      0
  CAM destination filters: 0, CAM source filters: 0
Packet Forwarding Engine configuration:
  Destination slot: 5
  Direction : Output
  CoS transmit queue            Bandwidth          Buffer Priority  Limit
                                %          bps          %          usec
  0 best-effort                 95      950000000    95          0          low    none
  3 network-control              5       50000000      5          0          low    none

  Direction : Input
  CoS transmit queue            Bandwidth          Buffer Priority  Limit
                                %          bps          %          usec
  0 best-effort                 95      950000000    95          0          low    none
  3 network-control              5       50000000      5          0          low    none

Logical interface xe-5/0/0.0 (Index 71) (SNMP ifIndex 95) (Generation 195)
Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.100 ] Encapsulation: ENET2
Traffic statistics:
  Input bytes :                  0
  Output bytes :                  46
  Input packets:                  0
  Output packets:                  1
IPv6 transit statistics:
  Input bytes :                  0
  Output bytes :                  0
  Input packets:                  0
  Output packets:                  0
Local statistics:
  Input bytes :                  0
  Output bytes :                  46
  Input packets:                  0
  Output packets:                  1
Transit statistics:
  Input bytes :                  0          0 bps
  Output bytes :                  0          0 bps
  Input packets:                  0          0 pps
  Output packets:                  0          0 pps
IPv6 transit statistics:
  Input bytes :                  0
  Output bytes :                  0
  Input packets:                  0
  Output packets:                  0
Protocol inet, MTU: 1500, Generation: 253, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
  Destination: 192.1.1/24, Local: 192.1.1.1, Broadcast: 192.1.1.255,
Generation: 265
  Protocol multiservice, MTU: Unlimited, Generation: 254, Route table: 0

```

Flags: None
 Policer: Input: __default_arp_policer__

**show interfaces
 extensive
 (10-Gigabit Ethernet,
 WAN PHY Mode)**

```
user@host> show interfaces xe-1/0/0 extensive
Physical interface: xe-1/0/0, Enabled, Physical link is Up
Interface index: 141, SNMP ifIndex: 34, Generation: 47
Link-level type: Ethernet, MTU: 1514, Speed: 10Gbps, Loopback: Disabled
WAN-PHY mode
Source filtering: Disabled, Flow control: Enabled
Device flags   : Present Running
Interface flags: SNMP-Traps 16384
Link flags     : None
CoS queues     : 4 supported
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:a2:10:9d, Hardware address: 00:05:85:a2:10:9d
Last flapped   : 2005-07-07 11:22:34 PDT (3d 12:28 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   : 0          0 bps
Output bytes  : 0          0 bps
Input packets : 0          0 pps
Output packets: 0          0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0,
L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
HS Link CRC errors: 0, HS Link FIFO overflows: 0,
Resource errors: 0
Output errors:
Carrier transitions: 1, Errors: 0, Drops: 0, Collisions: 0,
Aged packets: 0, FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0,
Resource errors: 0
Queue counters:
  Queued packets  Transmitted packets  Dropped packets
0 best-effort    0          0          0
1 expedited-fo   0          0          0
2 assured-forw   0          0          0
3 network-cont   0          0          0
Active alarms : LOL, LOS, LBL
Active defects: LOL, LOS, LBL, SEF, AIS-L, AIS-P
PCS statistics
  Seconds  Count
Bit errors  0      0
Errored blocks  0      0
MAC statistics:
  Receive  Transmit
Total octets  0      0
Total packets  0      0
Unicast packets  0      0
Broadcast packets  0      0
Multicast packets  0      0
CRC/Align errors  0      0
FIFO errors  0      0
MAC control frames  0      0
MAC pause frames  0      0
Oversized frames  0
Jabber frames  0
Fragment frames  0
VLAN tagged frames  0
Code violations  0
Filter statistics:
Input packet count  0
Input packet rejects  0
Input DA rejects  0
Input SA rejects  0
```

```

Output packet count                                0
Output packet pad count                            0
Output packet error count                          0
CAM destination filters: 0, CAM source filters: 0
PMA PHY:
  PLL lock                Seconds      Count  State
  PHY light               63159        1    Light Missing
WIS section:
  BIP-B1                  0            0
  SEF                     434430       434438 Defect Active
  LOS                     434430        1    Defect Active
  LOF                     434430        1    Defect Active
  ES-S                    434430
  SES-S                   434430
  SEFS-S                  434430
WIS line:
  BIP-B2                  0            0
  REI-L                   0            0
  RDI-L                   0            0    OK
  AIS-L                   434430        1    Defect Active
  BERR-SF                 0            0    OK
  BERR-SD                 0            0    OK
  ES-L                    434430
  SES-L                   434430
  UAS-L                   434420
  ES-LFE                  0
  SES-LFE                 0
  UAS-LFE                 0
WIS path:
  BIP-B3                  0            0
  REI-P                   0            0
  LOP-P                   0            0    OK
  AIS-P                   434430        1    Defect Active
  RDI-P                   0            0    OK
  UNEQ-P                  0            0    OK
  PLM-P                   0            0    OK
  ES-P                    434430
  SES-P                   434430
  UAS-P                   434420
  ES-PFE                  0
  SES-PFE                 0
  UAS-PFE                 0
Received path trace:
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted path trace: orissa so-1/0/0
  6f 72 69 73 73 61 20 73 6f 2d 31 2f 30 2f 30 00   orissa so-1/0/0.
Packet Forwarding Engine configuration:
  Destination slot: 1
  CoS transmit queue      %      Bandwidth      %      Buffer      Priority  Limit
                           %      bps                %      bytes
  0 best-effort           95      950000000      95      0          low      none
  3 network-control       5       50000000       5       0          low      none

```

**show interfaces
extensive
(10-Gigabit Ethernet,
FEC)**

```

user@host> show interfaces ge-7/1/0 extensive
Physical interface: ge-7/1/0, Enabled, Physical link is Up
Interface index: 137, SNMP ifIndex: 32, Generation: 138
Link-level type: Ethernet, MTU: 1514, Speed: 10Gbps, Loopback: Disabled, Source
filtering: Disabled,
Flow control: Enabled
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000

```



```

Link flags      : None
Wavelength     : 1556.56 nm, Frequency: 192.60 THz
CoS queues     : 8 supported, 8 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:60:2f:31, Hardware address: 00:05:85:60:2f:31
Last flapped   : 2008-03-21 11:28:50 PDT (00:19:52 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes   : 0                      0 bps
  Output bytes  : 0                      0 bps
  Input packets : 0                      0 pps
  Output packets: 0                      0 pps
IPv6 transit statistics:
  Input bytes   : 0
  Output bytes  : 0
  Input packets : 0
  Output packets: 0
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3
incompletes: 0,
  L2 channel errors: 0, L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors:
0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,
FIFO errors: 0,
  HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort      0                0                0
  1 expedited-fo     0                0                0
  2 assured-forw     0                0                0
  3 network-cont     0                0                0

Active alarms : None
Active defects : None
OTN FEC statistics:
  Corrected Errors      0 bps
  Corrected Error Ratio 1e-12
MAC statistics:
  Receive      Transmit
...
```

**show interfaces
extensive (10-Gigabit
Ethernet, LAN PHY
Mode, Unidirectional
Mode)**

```

user@host> show interfaces xe-7/0/0 extensive
Physical interface: xe-7/0/0, Enabled, Physical link is Up
Interface index: 173, SNMP ifIndex: 212, Generation: 174
Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps,
Unidirectional: Enabled,
Loopback: None, Source filtering: Disabled, Flow control: Enabled
Device flags   : Present Running
...
```

**show interfaces
extensive (10-Gigabit
Ethernet, LAN PHY
Mode, Unidirectional
Mode, Transmit-Only)**

```

user@host> show interfaces xe-7/0/0-tx extensive
Physical interface: xe-7/0/0-tx, Enabled, Physical link is Up
Interface index: 176, SNMP ifIndex: 137, Generation: 177
Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps,
Unidirectional: Tx-Only
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
```

```

Link flags      : None
CoS queues      : 8 supported, 8 maximum usable queues
Hold-times      : Up 0 ms, Down 0 ms
Current address: 00:05:85:73:e4:83, Hardware address: 00:05:85:73:e4:83
Last flapped    : 2007-06-01 09:08:19 PDT (3d 02:31 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :                0                0 bps
Output bytes :      322891152287160      9627472888 bps
Input packets:                0                0 pps
Output packets:    328809727380      1225492 pps

...

Filter statistics:
Output packet count      328810554250
Output packet pad count      0
Output packet error count    0

...

Logical interface xe-7/0/0-tx.0 (Index 73) (SNMP ifIndex 138) (Generation 139)

Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
Input bytes :                0
Output bytes :      322891152287160
Input packets:                0
Output packets:    328809727380
IPv6 transit statistics:
Input bytes :                0
Output bytes :                0
Input packets:                0
Output packets:                0
Local statistics:
Input bytes :                0
Output bytes :                0
Input packets:                0
Output packets:                0
Transit statistics:
Input bytes :                0                0 bps
Output bytes :      322891152287160      9627472888 bps
Input packets:                0                0 pps
Output packets:    328809727380      1225492 pps
IPv6 transit statistics:
Input bytes :                0
Output bytes :                0
Input packets:                0
Output packets:                0
Protocol inet, MTU: 1500, Generation: 147, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.11.12/24, Local: 10.11.12.13, Broadcast: 10.11.12.255,
Generation: 141
Protocol multiservice, MTU: Unlimited, Generation: 148, Route table: 0
Flags: None
Policer: Input: __default_arp_policer__

```

**show interfaces
extensive (10-Gigabit
Ethernet, LAN PHY
Mode, Unidirectional
Mode, Receive-Only)**

```

user@host> show interfaces xe-7/0/0-rx extensive
Physical interface: xe-7/0/0-rx, Enabled, Physical link is Up
Interface index: 174, SNMP ifIndex: 118, Generation: 175
Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps,
Unidirectional: Rx-Only

```

```

Device flags      : Present Running
Interface flags:  SNMP-Traps Internal: 0x4000
Link flags       : None
CoS queues       : 8 supported, 8 maximum usable queues
Hold-times       : Up 0 ms, Down 0 ms
Current address:  00:05:85:73:e4:83, Hardware address: 00:05:85:73:e4:83
Last flapped     : 2007-06-01 09:08:22 PDT (3d 02:31 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :      322857456303482          9627496104 bps
  Output bytes :                      0              0 bps
  Input packets:      328775413751          1225495 pps
  Output packets:                      0              0 pps

...

Filter statistics:
  Input packet count      328775015056
  Input packet rejects    1
  Input DA rejects        0

...

Logical interface xe-7/0/0-rx.0 (Index 72) (SNMP ifIndex 120) (Generation 138)

Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
  Input bytes :      322857456303482
  Output bytes :                      0
  Input packets:      328775413751
  Output packets:                      0
IPv6 transit statistics:
  Input bytes :                      0
  Output bytes :                      0
  Input packets:                      0
  Output packets:                      0
Local statistics:
  Input bytes :                      0
  Output bytes :                      0
  Input packets:                      0
  Output packets:                      0
Transit statistics:
  Input bytes :      322857456303482          9627496104 bps
  Output bytes :                      0              0 bps
  Input packets:      328775413751          1225495 pps
  Output packets:                      0              0 pps
IPv6 transit statistics:
  Input bytes :                      0
  Output bytes :                      0
  Input packets:                      0
  Output packets:                      0
Protocol inet, MTU: 1500, Generation: 145, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.1.1/24, Local: 192.1.1.1, Broadcast: 192.1.1.255,
Generation: 139
Protocol multiservice, MTU: Unlimited, Generation: 146, Route table: 0
  Flags: None
  Policer: Input: __default_arp_policer__

```

show interfaces interface-set (Ethernet Interface Set)

| | |
|---------------------------------|---|
| Syntax | show interfaces interface-set <i>interface-set-name</i> <detail terse> |
| Release Information | Command introduced in JUNOS Release 8.5. |
| Description | Display information about the specified gigabit or 10-Gigabit Ethernet interface set. Supported in MX-series routers with enhanced queuing DPCs. |
| Options | <i>interface-set-name</i> —Display information about the specified gigabit or 10-Gigabit Ethernet interface set. detail terse—(Optional) Display the specified level of output. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces interface-set terse on page 153 show interfaces interface-set detail on page 153 |
| Output Fields | See Table 30 on page 121 for the output fields for the show interfaces (Fast Ethernet and Gigabit Ethernet) command. Table 32 on page 152 describes the information for the show interfaces interface-set command. |

Table 32: Ethernet show interfaces interface-set Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------|
| Physical Interface | | |
| Interface set | Name of the interface set or sets. | All levels |
| Interface set index | Index number of the interface set. | detail |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the specified interface set. <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface set ■ Input packets, Output packets—Number of packets received and transmitted on the interface set. | detail |
| Egress queues supported | Total number of egress queues supported on the specified interface set. | detail |
| Egress queues in use | Total number of egress queues used on the specified interface set. | detail |
| Queue counters | Queued packets, Transmitted packets, and Dropped packets statistics for the four forwarding classes. | detail |
| Members | List of all the interface-sets. | detail |

```

show interfaces      user@host> show interfaces interface-set terse
interface-set terse  Interface set:
                        iflset-xe-11/3/0-0
                        ge-1/0/1-0
                        ge-1/0/1-2

show interfaces      user@host> show interfaces interface-set iflset-xe-11/3/0-0 detail
interface-set detail Interface set: iflset-xe-11/3/0-0
                        Interface set index: 19
                        Traffic statistics:
                        Output bytes :          751017840          401673504 bps
                        Output packets:        11044380          738377 pps
                        Egress queues: 4 supported, 4 in use
                        Queue counters:
                        Queued packets  Transmitted packets  Dropped packets
                        0 best-effort    211091327          11044380          199995746
                        1 expedited-fo         0                0                0
                        2 assured-forw         0                0                0
                        3 network-cont         0                0                0
                        Members:
                        xe-11/3/0.0

```

show interfaces interface-set queue

| | |
|---------------------------------|---|
| Syntax | show interfaces interface-set queue <i>interface-set-name</i> <aggregate remaining-traffic> <forwarding-class <i>class-name</i> > |
| Release Information | Command introduced in JUNOS Release 8.5. |
| Description | Display information about the gigabit or 10-Gigabit Ethernet interface set queue. Supported in MX-series routers with enhanced queuing DPCs. |
| Options | <p><i>interface-set-name</i>—(Optional) Display information about the specified gigabit or 10-Gigabit Ethernet interface set. Wildcard values can be used in the interface set name.</p> <p><i>aggregate</i>—(Optional) Display the aggregated queuing statistics of all member logical interfaces for interface sets that have traffic-control profiles configured.</p> <p><i>both-ingress-egress</i>—(Optional) On Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs, display both ingress and egress queue statistics.</p> <p><i>egress</i>—(Optional) Display egress queue statistics.</p> <p><i>forwarding-class class-name</i>—(Optional) Display queuing statistics for the specified forwarding class.</p> <p><i>ingress</i>—(Optional) On Gigabit Ethernet IQ2 PICs, display ingress queue statistics.</p> <p><i>remaining-traffic</i>—(Optional) Display the queuing statistics of all member logical interfaces for interface sets that do not have traffic-control profiles configured.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces interface-set queue (Gigabit Ethernet) on page 155</p> <p>show interfaces interface-set queue both-ingress-egress (Enhanced DPC) on page 156</p> <p>show interfaces interface-set queue egress (Enhanced DPC) on page 158</p> <p>show interfaces interface-set queue forwarding-class (Gigabit Ethernet) on page 159</p> <p>show interfaces interface-set queue (Enhanced DPC) on page 160</p> <p>show interfaces interface-set queue remaining-traffic (Gigabit Ethernet) on page 160</p> |
| Output Fields | <p>See Table 21 on page 50 for the output fields for the show interfaces (Fast Ethernet and Gigabit Ethernet) command.</p> <p>Table 33 on page 154 describes the information for the show interfaces interface-set queue command.</p> |

Table 33: Ethernet show interfaces interface-set queue Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|-------------------|-----------------|
| Physical Interface | | |

Table 33: Ethernet show interfaces interface-set queue Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|------------------------------|--|-----------------|
| Interface set | Name of the interface set. | All levels |
| Interface set index | Index number of the interface set. | All levels |
| Forwarding classes supported | Total number of forwarding classes supported on the specified interface set. | All levels |
| Forwarding classes in use | Total number of forwarding classes used on the specified interface set. | All levels |
| Egress queues supported | Total number of egress queues supported on the specified interface set. | All levels |
| Egress queues in use | Total number of egress queues used on the specified interface set. | All levels |
| Ingress queues supported | Total number of ingress queues supported on the specified interface set. | |
| Ingress queues in use | Total number of ingress queues used on the specified interface set. | |
| Queue | Egress or ingress queue number for the statistics being displayed. | All levels |
| Forwarding classes | Forwarding class name for the statistics being displayed. | All levels |
| Queued | Packet and Byte statistics for the specified queue. <ul style="list-style-type: none"> ■ Packets—Number of packets queued and input rate in packets per second. ■ Bytes—Number of bytes queued and input rate in bytes per second. | All levels |
| Transmitted | Packet and Byte statistics for the specified forwarding class. <ul style="list-style-type: none"> ■ Packets—Number of packets transmitted and transmit rate in packets per second. ■ Bytes—Number of bytes transmitted and transmit rate in bytes per second. ■ Tail-dropped packets—Number of packets tail dropped. ■ RED-dropped packets—Number of RED-dropped packets for the low, medium-low, medium-high, and high loss priorities. ■ RED-dropped bytes—Number of RED-dropped bytes for the low, medium-low, medium-high, and high loss priorities. | All levels |

**show interfaces
interface-set queue
(Gigabit Ethernet)**

```
user@host> show interfaces interface-set queue ge-2/2/0-0
```

```
Interface set: ge-2/2/0-0
```

```
Interface set index: 3
```

```
Forwarding classes: 8 supported, 4 in use
```

```
Egress queues: 4 supported, 4 in use
```

```
Queue: 0, Forwarding classes: best-effort
```

```
Queued:
```

```
    Packets                :                3998482                1 pps
```

```
    Bytes                  :                271896884            688 bps
```

```
Transmitted:
```

```

Packets          :          1077474          1 pps
Bytes            :          73268340        688 bps
Tail-dropped packets :          0          0 pps
RED-dropped packets :          2921008          0 pps
  Low            :          2921008          0 pps
  Medium-low     :          0          0 pps
  Medium-high    :          0          0 pps
  High           :          0          0 pps
RED-dropped bytes :          198628544          0 bps
  Low            :          198628544          0 bps
  Medium-low     :          0          0 bps
  Medium-high    :          0          0 bps
  High           :          0          0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets          :          0          0 pps
  Bytes            :          0          0 bps
Transmitted:
...

```

**show interfaces
interface-set queue
both-ingress-egress
(Enhanced DPC)**

```

user@host> show interfaces interface-set queue ge-2/2/0-0 both-ingress-egress
Interface set: ge-2/2/0-0
Interface set index: 3
Forwarding classes: 16 supported, 4 in use
Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
  Packets          :          185968478        473161 pps
  Bytes            :          10042313520      204441336 bps
Transmitted:
  Packets          :          5441673          13780 pps
  Bytes            :          293850342        5952960 bps
  Tail-dropped packets :          0          0 pps
  RED-dropped packets :          180526772        459372 pps
  RED-dropped bytes  :          9748446282      198451512 bps
Queue: 1, Forwarding classes: expedited-forwarding
Queued:
  Packets          :          0          0 pps
  Bytes            :          0          0 bps
Transmitted:
  Packets          :          0          0 pps
  Bytes            :          0          0 bps
  Tail-dropped packets :          0          0 pps
  RED-dropped packets :          0          0 pps
  RED-dropped bytes  :          0          0 bps
Queue: 2, Forwarding classes: assured-forwarding
Queued:
  Packets          :          522021472        473602 pps
  Bytes            :          28190332480      204599944 bps
Transmitted:
  Packets          :          5791772          4055 pps
  Bytes            :          312755688        1751976 bps
  Tail-dropped packets :          0          0 pps
  RED-dropped packets :          516227139        469546 pps
  RED-dropped bytes  :          27876265560    202843872 bps
Queue: 3, Forwarding classes: network-control
Queued:
  Packets          :          0          0 pps
  Bytes            :          0          0 bps
Transmitted:
  Packets          :          0          0 pps

```



```

Bytes : 0 0 bps
Tail-dropped packets : 0 0 pps
RED-dropped packets : 0 0 pps
RED-dropped bytes : 0 0 bps
Forwarding classes: 16 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets : 5417304 13797 pps
    Bytes : 368429508 7506096 bps
  Transmitted:
    Packets : 5014996 12769 pps
    Bytes : 341019728 6946560 bps
    Tail-dropped packets : 0 0 pps
    RED-dropped packets : 402189 1028 pps
    Low : 402189 1028 pps
    Medium-low : 0 0 pps
    Medium-high : 0 0 pps
    High : 0 0 pps
    RED-dropped bytes : 27348852 559536 bps
    Low : 27348852 559536 bps
    Medium-low : 0 0 bps
    Medium-high : 0 0 bps
    High : 0 0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets : 0 0 pps
    Bytes : 0 0 bps
  Transmitted:
    Packets : 0 0 pps
    Bytes : 0 0 bps
    Tail-dropped packets : 0 0 pps
    RED-dropped packets : 0 0 pps
    Low : 0 0 pps
    Medium-low : 0 0 pps
    Medium-high : 0 0 pps
    High : 0 0 pps
    RED-dropped bytes : 0 0 bps
    Low : 0 0 bps
    Medium-low : 0 0 bps
    Medium-high : 0 0 bps
    High : 0 0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:
    Packets : 5770534 3963 pps
    Bytes : 396943252 2156144 bps
  Transmitted:
    Packets : 3945152 1457 pps
    Bytes : 268270336 792608 bps
    Tail-dropped packets : 0 0 pps
    RED-dropped packets : 1815141 2506 pps
    Low : 1815141 2506 pps
    Medium-low : 0 0 pps
    Medium-high : 0 0 pps
    High : 0 0 pps
    RED-dropped bytes : 123429524 1363536 bps
    Low : 123429524 1363536 bps
    Medium-low : 0 0 bps
    Medium-high : 0 0 bps
    High : 0 0 bps
Queue: 3, Forwarding classes: network-control

```

```

Queued:
  Packets      :          0          0 pps
  Bytes        :          0          0 bps
Transmitted:
  Packets      :          0          0 pps
  Bytes        :          0          0 bps
  Tail-dropped packets :          0          0 pps
  RED-dropped packets :          0          0 pps
    Low        :          0          0 pps
    Medium-low :          0          0 pps
    Medium-high :          0          0 pps
    High        :          0          0 pps
  RED-dropped bytes :          0          0 bps
    Low        :          0          0 bps
    Medium-low :          0          0 bps
    Medium-high :          0          0 bps
    High        :          0          0 bps

```

show interfaces
interface-set queue
egress (Enhanced DPC)

```

user@host> show interfaces interface-set queue ge-2/2/0-0 egress
Interface set: ge-2/2/0-0
Interface set index: 3
Forwarding classes: 16 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets      :          3958253          13822 pps
    Bytes        :          269217592          7519712 bps
  Transmitted:
    Packets      :          3665035          12729 pps
    Bytes        :          249222380          6924848 bps
    Tail-dropped packets :          0          0 pps
    RED-dropped packets :          293091          1093 pps
      Low        :          293091          1093 pps
      Medium-low :          0          0 pps
      Medium-high :          0          0 pps
      High        :          0          0 pps
    RED-dropped bytes :          19930188          594864 bps
      Low        :          19930188          594864 bps
      Medium-low :          0          0 bps
      Medium-high :          0          0 bps
      High        :          0          0 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
  Transmitted:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
    Tail-dropped packets :          0          0 pps
    RED-dropped packets :          0          0 pps
      Low        :          0          0 pps
      Medium-low :          0          0 pps
      Medium-high :          0          0 pps
      High        :          0          0 pps
    RED-dropped bytes :          0          0 bps
      Low        :          0          0 bps
      Medium-low :          0          0 bps
      Medium-high :          0          0 bps
      High        :          0          0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:

```

```

Packets      :          5350989          3904 pps
Bytes        :          368412924        2124048 bps
Transmitted:
Packets      :          3790469          1465 pps
Bytes        :          257751892        796960 bps
Tail-dropped packets :          0          0 pps
RED-dropped packets :          1550282        2439 pps
  Low        :          1550282        2439 pps
  Medium-low :          0          0 pps
  Medium-high :          0          0 pps
  High       :          0          0 pps
RED-dropped bytes :          105419176      1327088 bps
  Low        :          105419176      1327088 bps
  Medium-low :          0          0 bps
  Medium-high :          0          0 bps
  High       :          0          0 bps
Queue: 3, Forwarding classes: network-control
Queued:
Packets      :          0          0 pps
Bytes        :          0          0 bps
Transmitted:
Packets      :          0          0 pps
Bytes        :          0          0 bps
Tail-dropped packets :          0          0 pps
RED-dropped packets :          0          0 pps
  Low        :          0          0 pps
  Medium-low :          0          0 pps
  Medium-high :          0          0 pps
  High       :          0          0 pps
RED-dropped bytes :          0          0 bps
  Low        :          0          0 bps
  Medium-low :          0          0 bps
  Medium-high :          0          0 bps
  High       :          0          0 bps

```

```

show interfaces user@host> show interfaces interface-set queue ge-2/2/0-0 forwarding-class
interface-set queue best-effort
forwarding-class
(Gigabit Ethernet)
Interface set: ge-2/2/0-0
Interface set index: 3
Forwarding classes: 8 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
Queued:
Packets      :          101857694        1420083 pps
Bytes        :          6927234456      772532320 bps
Transmitted:
Packets      :          3984693          55500 pps
Bytes        :          270959592        30192512 bps
Tail-dropped packets :          0          0 pps
RED-dropped packets :          97870952      1364583 pps
  Low        :          97870952      1364583 pps
  Medium-low :          0          0 pps
  Medium-high :          0          0 pps
  High       :          0          0 pps
RED-dropped bytes :          6655225776      742339808 bps
  Low        :          6655225776      742339808 bps
  Medium-low :          0          0 bps
  Medium-high :          0          0 bps
  High       :          0          0 bps

```

show interfaces
interface-set queue
(Enhanced DPC)

```

user@host> show interfaces interface-set queue ge-2/2/0-0 ingress
Interface set: foo
Interface set index: 3
Forwarding classes: 16 supported, 4 in use
Ingress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets      :      149036817      473711 pps
    Bytes        :      8048003934    204642936 bps
  Transmitted:
    Packets      :      4360749      13891 pps
    Bytes        :     235480446    6000912 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :     144676035    459820 pps
    RED-dropped bytes  :     7812506592 198642024 bps
Queue: 1, Forwarding classes: expedited-forwarding
  Queued:
    Packets      :      0      0 pps
    Bytes        :      0      0 bps
  Transmitted:
    Packets      :      0      0 pps
    Bytes        :      0      0 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps
Queue: 2, Forwarding classes: assured-forwarding
  Queued:
    Packets      :     485089207      473605 pps
    Bytes        :    26195987476    204597576 bps
  Transmitted:
    Packets      :     5480799      3959 pps
    Bytes        :    295963146    1710504 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :     479605853    469646 pps
    RED-dropped bytes  :    25898716170 202887072 bps
Queue: 3, Forwarding classes: network-control
  Queued:
    Packets      :      0      0 pps
    Bytes        :      0      0 bps
  Transmitted:
    Packets      :      0      0 pps
    Bytes        :      0      0 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :      0      0 pps
    RED-dropped bytes  :      0      0 bps

```

show interfaces
interface-set queue
remaining-traffic
(Gigabit Ethernet)

```

user@host> show interfaces interface-set queue ge-2/2/0-0 remaining-traffic
Interface set: ge-2/2/0-0
Interface set index: 12
Forwarding classes: 8 supported, 4 in use
Egress queues: 4 supported, 4 in use
Queue: 0, Forwarding classes: best-effort
  Queued:
    Packets      :      2201552      0 pps
    Bytes        :     149705536      0 bps
  Transmitted:
    Packets      :      609765      0 pps
    Bytes        :     41464020      0 bps
    Tail-dropped packets :      0      0 pps
    RED-dropped packets :     1591787      0 pps
    Low          :     1591787      0 pps

```

| | | | |
|-------------------|---|-----------|-------|
| Medium-low | : | 0 | 0 pps |
| Medium-high | : | 0 | 0 pps |
| High | : | 0 | 0 pps |
| RED-dropped bytes | : | 108241516 | 0 bps |
| Low | : | 108241516 | 0 bps |
| Medium-low | : | 0 | 0 bps |
| Medium-high | : | 0 | 0 bps |
| High | : | 0 | 0 bps |

show interfaces diagnostics optics (10-Gigabit Ethernet)



| | |
|---|---|
| Syntax | show interfaces diagnostics optics <i>interface-name</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M120, M320, T320, MX960, and T640 routers only) Display diagnostics data and alarms for 10-Gigabit Ethernet dense wavelength-division multiplexing (DWDM) interfaces. |
| Options | <i>interface-name</i> —Interface name: <i>ge-fpc/pic/port</i> or <i>xe-fpc/pic/port</i> . |
| Additional Information | <p>XENPAK Multisource Agreement (MSA) optics, 300-pin MSA optics, bidirectional small form-factor pluggable transceiver (SFP) optics, SFP optics, 10-gigabit small form-factor pluggable transceiver (XFP) optics, and Optical Transport Network (OTN) optics are supported. The 300-pin MSA tool kit polls the PIC and the XENPAK driver polls the XENPAK transceiver in 1-second intervals for diagnostics data, alarms, and warnings and stores them into memory. The alarms will not cause the links to go down or the LEDs to change color, nor generate SNMP traps. Changes in alarm and warning status will generate system log messages.</p> <p>Thresholds that trigger a high alarm, low alarm, high warning, or low warning are set by the transponder vendors. Generally, a high alarm or low alarm indicates that the optics module is not operating properly. This information can be used to diagnose why a PIC is not working.</p> |
|  | <p>NOTE: Some 10-Gigabit Ethernet XENPAK transceivers do not support all optical diagnostics. If the diagnostics are not supported, you will see N/A in the following fields in the output: Laser bias current, Laser output power, Laser rx power, and Module temperature.</p> |
|  | <p>NOTE: The show interfaces diagnostics optics command for optical interfaces does not report the decibel (dBm) value of the received signal if the received power is zero milliwatts (0.0000 mW).</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces diagnostics optics (300-Pin MSA Optics) on page 176</p> <p>show interfaces diagnostics optics (Bidirectional SFP Optics) on page 176</p> <p>show interfaces diagnostics optics (OTN Optics) on page 177</p> <p>show interfaces diagnostics optics (SFP MSA Optics) on page 177</p> <p>show interfaces diagnostics optics (XENPAK MSA Optics) on page 179</p> <p>show interfaces diagnostics optics (XFP Optics) on page 179</p> |
| Output Fields | Table 34 on page 163 lists the output fields for the show interfaces diagnostics optics command when the router is operating with MSA optics. Output fields are listed in the approximate order in which they appear. |

Table 34: 10-Gigabit Ethernet 300-Pin MSA Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|--|--|
| Physical interface | Name of the physical interface. |
| Laser bias current | Magnitude of the laser bias power setting current, in milliamperes. The laser bias provides direct modulation of laser diodes and modulates currents. |
| Laser output power | Laser output power, in milliwatts (mW) and decibels, referenced to 1.0 mW (dBm). This is a software equivalent to the LsPOWMON pin in hardware. |
| Receiver signal average optical power | Average received optical power, in mW and dBm. This indicator is a software equivalent to the RxPOWMON pin in hardware. Average optical power is vendor-specific. For example: <ul style="list-style-type: none"> ■ Intel—Rx power monitor: +/- 1 dB ■ Opnext—Rx power monitor: +/- 1.5 dB |
| Laser end-of-life alarm | Laser end-of-life alarm: On or Off. |
| Laser wavelength alarm | Laser wavelength alarm: On or Off. |
| Laser bias current alarm | Laser bias current alarm: On or Off. |
| Laser temperature alarm | Laser temperature alarm: On or Off. |
| Laser power alarm | Laser power alarm: On or Off. |
| Modulator temperature alarm | (Opnext 300-pin MSA transponders only) Modulator temperature alarm: On or Off. |
| Modulator bias alarm | Modulator bias alarm: On or Off. |
| Tx multiplexer FIFO error alarm | Transmit multiplexer first in, first out (FIFO) error alarm: On or Off. |
| Tx loss of PLL lock alarm | Transmit loss of phase-locked loop (PLL) lock alarm: On or Off. |
| Rx loss of average optical power alarm | Receive loss of average optical power alarm: On or Off. |
| Rx loss of AC power alarm | (Opnext 300-pin MSA transponders only) Receive loss of AC power alarm: On or Off. |
| Rx loss of PLL lock alarm | Receive loss of phase-locked loop (PLL) lock alarm: On or Off. |

Table 35 on page 164 lists the output fields for the `show interfaces diagnostics optics` command when the router is operating with bidirectional SFP optics. Output fields are listed in the approximate order in which they appear.

Table 35: 10-Gigabit Ethernet Bidirectional SFP Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|---------------------------------------|---|
| Physical interface | Name of the physical interface. |
| Laser bias current | Magnitude of the laser bias power setting current, in milliamperes. The laser bias provides direct modulation of laser diodes and modulates currents. |
| Laser output power | Laser output power, in milliwatts (mW) and decibels, referenced to 1.0 mW (dBm). |
| Module temperature | Temperature of the XFP optics module, in Celsius and Fahrenheit. |
| Module voltage | Internally measured module voltage. |
| Receiver signal average optical power | Average received optical power, in mW and dBm. |
| Laser bias current high alarm | Laser bias power setting high alarm. Displays on or off. |
| Laser bias current low alarm | Laser bias power setting low alarm. Displays on or off. |
| Laser bias current high warning | Laser bias power setting high warning. Displays on or off. |
| Laser bias current low warning | Laser bias power setting low warning. Displays on or off. |
| Laser output power high alarm | Laser output power high alarm. Displays on or off. |
| Laser output power low alarm | Laser output power low alarm. Displays on or off. |
| Laser output power high warning | Laser output power high warning. Displays on or off. |
| Laser output power low warning | Laser output power low warning. Displays on or off. |
| Module temperature high alarm | Module temperature high alarm. Displays on or off. |
| Module temperature low alarm | Module temperature low alarm. Displays on or off. |
| Module temperature high warning | Module temperature high warning. Displays on or off. |
| Module temperature low warning | Module temperature low warning. Displays on or off. |
| Module voltage high alarm | Module voltage high alarm. Displays on or off. |

Table 35: 10-Gigabit Ethernet Bidirectional SFP Optics show interfaces diagnostics optics Output Fields (continued)

| Field Name | Field Description |
|---|---|
| Module voltage low alarm | Module voltage low alarm. Displays on or off. |
| Module voltage high warning | Module voltage high warning. Displays on or off. |
| Module voltage low warning | Module voltage high warning. Displays on or off. |
| Laser rx power high alarm | Receive laser power high alarm. Displays on or off. |
| Laser rx power low alarm | Receive laser power low alarm. Displays on or off. |
| Laser rx power high warning | Receive laser power high warning. Displays on or off. |
| Laser rx power low warning | Receive laser power low warning. Displays on or off. |
| Laser bias current high alarm threshold | Vendor-specified threshold for the laser bias current high alarm: 70.000 mA. |
| Laser bias current low alarm threshold | Vendor-specified threshold for the laser bias current low alarm: 0.0002 mA. |
| Laser bias current high warning threshold | Vendor-specified threshold for the laser bias current high warning: 65.000 mA. |
| Laser bias current low warning threshold | Vendor-specified threshold for the laser bias current low warning: 0.0002 mA. |
| Laser output power high alarm threshold | Vendor-specified threshold for the laser output power high alarm: 1.0000 mW or 0.00 dBm. |
| Laser output power low alarm threshold | Vendor-specified threshold for the laser output power low alarm: 0.0560 mW or -12.52 dBm. |
| Laser output power high warning threshold | Vendor-specified threshold for the laser output power high warning: 0.6300 mW or -2.01 dBm. |
| Laser output power low warning threshold | Vendor-specified threshold for the laser output power low warning: 0.0890 mW or -10.51 dBm. |
| Module temperature high alarm threshold | Vendor-specified threshold for the module temperature high alarm: 100° C or 212° F. |
| Module temperature low alarm threshold | Vendor-specified threshold for the module temperature low alarm: -50° C or -58° F. |
| Module temperature high warning threshold | Vendor-specified threshold for the module temperature high warning: 95 ° C or 203 ° F. |

Table 35: 10-Gigabit Ethernet Bidirectional SFP Optics show interfaces diagnostics optics Output Fields (continued)

| Field Name | Field Description |
|--|---|
| Module temperature low warning threshold | Vendor-specified threshold for the module temperature low warning: -48° C or -54° F. |
| Module voltage high alarm threshold | Module voltage high alarm threshold: 3.700 v. |
| Module voltage low alarm threshold | Module voltage low alarm threshold: 2.900 v. |
| Module voltage high warning threshold | Module voltage high warning threshold: 3.7600 v. |
| Module voltage low warning threshold | Module voltage low warning threshold: 3.000 v. |
| Laser rx power high alarm threshold | Vendor-specified threshold for the laser Rx power high alarm: 1.9953 mW or 3.00 dBm. |
| Laser rx power low alarm threshold | Vendor-specified threshold for the laser Rx power low alarm: 0.0001 mW or -40.00 dBm. |
| Laser rx power high warning threshold | Vendor-specified threshold for the laser Rx power high warning: 1.0000 mW or 0.00 dBm. |
| Laser rx power low warning threshold | Vendor-specified threshold for the laser Rx power low warning: 0.0010 mW or -30.00 dBm. |

Table 36 on page 166 lists the output fields for the `show interfaces diagnostics optics` command generated from 10-Gigabit Ethernet XENPAK OTN optics.

Table 36: XENPAK OTN Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|-------------------------------|---|
| Physical interface | Name of the physical interface. |
| Laser bias current | Measured laser bias current in uA. |
| Laser output power | Measured laser output power in mW. |
| Module temperature | Internally measured module temperature. |
| Laser rx power | Measured receive optical power in mW. |
| Laser bias current high alarm | Laser bias current high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current low alarm | Laser bias current low alarm: On or Off. Alarm ranges are vendor-specific. |

Table 36: XENPAK OTN Optics show interfaces diagnostics optics Output Fields (continued)

| Field Name | Field Description |
|---|--|
| Laser output power high alarm | Laser output power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser output power low alarm | Laser output power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp high alarm | Module temperature high alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp low alarm | Module temperature low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power high alarm | Laser receive power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power low alarm | Laser receive power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current high warning | Laser bias current high warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current low warning | Laser bias current low warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power high warning | Laser output power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power low warning | Laser output power low warning: On or Off. Warning ranges are vendor-specific. |
| Module temp high warning | Module temperature high warning: On or Off. Warning ranges are vendor-specific. |
| Module temp low warning | Module temperature low warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power high warning | Laser receive power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power low warning | Laser receive power low warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current high alarm threshold | Vendor-specified threshold for the laser bias current high alarm: 31.000 mA. |
| Laser bias current low alarm threshold | Vendor-specified threshold for the laser bias current low alarm: 10.000 mA. |
| Laser output power high alarm threshold | Vendor-specified threshold for the laser output power high alarm: 6.000 mW or 7.78 dBm. |
| Laser output power low alarm threshold | Vendor-specified threshold for the laser output power low alarm: 0.100 mW or -10.00 dBm. |
| Module temperature high alarm threshold | Vendor-specified threshold for the module temperature high alarm: 85° C or 185° F. |

Table 36: XENPAK OTN Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| Module temperature low alarm threshold | Vendor-specified threshold for the module temperature low alarm: 0° C or 32° F. |
| Laser rx power high alarm threshold | Vendor-specified threshold for the laser Rx power high alarm: 1.000 mW or 0.00 dBm. |
| Laser rx power low alarm threshold | Vendor-specified threshold for the laser Rx power low alarm: 0.001 mW or -30.00 dBm. |
| Laser bias current high warning threshold | Vendor-specified threshold for the laser bias current high warning: 28.000 mA. |
| Laser bias current low warning threshold | Vendor-specified threshold for the laser bias current low warning: 11.000 mA. |
| Laser output power high warning threshold | Vendor-specified threshold for the laser output power high warning: 5.000 mW or 6.99 dBm. |
| Laser output power low warning threshold | Vendor-specified threshold for the laser output power low warning: 0.500 mW or -3.01 dBm. |
| Module temperature high warning threshold | Vendor-specified threshold for the module temperature high warning: 70° C or 158° F. |
| Module temperature low warning threshold | Vendor-specified threshold for the module temperature low warning: 10° C or 50° F. |
| Laser rx power high warning threshold | Vendor-specified threshold for the laser Rx power high warning: 0.501 mW or -3.00 dBm. |
| Laser rx power low warning threshold | Vendor-specified threshold for the laser Rx power low warning: 0.001 mW or -28.86 dBm. |

Table 37 on page 168 lists the output fields for the **show interfaces diagnostics optics** command when the router is operating with SFP MSA optics. Output fields are listed in the approximate order in which they appear.

Table 37: 10-Gigabit Ethernet SFP MSA Optics show interfaces diagnostics Output Fields

| Field Name | Field Description |
|--------------------|---|
| Physical interface | Name of the physical interface. |
| Laser bias current | Measured laser bias current in uA. |
| Laser output power | Measured laser output power in mW. |
| Module temperature | Internally measured module temperature. |
| Module voltage | Internally measured module voltage. |

Table 37: 10-Gigabit Ethernet SFP MSA Optics show interfaces diagnostics Output Fields (continued)

| Field Name | Field Description |
|---|--|
| Laser rx power | Measured receive optical power in mW. |
| Laser bias current high alarm | Laser bias current high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current low alarm | Laser bias current low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser output power high alarm | Laser output power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser output power low alarm | Laser output power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp high alarm | Module temperature high alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp low alarm | Module temperature low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power high alarm | Laser receive power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power low alarm | Laser receive power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current high warning | Laser bias current high warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current low warning | Laser bias current low warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power high warning | Laser output power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power low warning | Laser output power low warning: On or Off. Warning ranges are vendor-specific. |
| Module temperature high warning | Module temperature high warning: On or Off. Warning ranges are vendor-specific. |
| Module temperature low warning | Module temperature low warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power high warning | Laser receive power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power low warning | Laser receive power low warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current high alarm threshold | Laser bias current high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser bias current low alarm threshold | Laser bias current low alarm threshold. Alarm threshold ranges are vendor-specific. |

Table 37: 10-Gigabit Ethernet SFP MSA Optics show interfaces diagnostics Output Fields (*continued*)

| Field Name | Field Description |
|---|---|
| Laser bias current high warning threshold | Laser bias current high warning threshold. Warning ranges are vendor-specific. |
| Laser bias current low warning threshold | Laser bias current low warning threshold. Warning ranges are vendor-specific. |
| Laser output power high alarm threshold | Laser output power high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser output power low alarm threshold | Laser output power low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser output power high warning threshold | Laser output power high warning threshold. Warning ranges are vendor-specific. |
| Laser output power low warning threshold | Laser output power low warning threshold. Warning ranges are vendor-specific. |
| Module temperature high alarm threshold | Module temperature high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Module temperature low alarm threshold | Module temperature low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Module temperature high warning threshold | Module temperature high warning threshold. Warning ranges are vendor-specific. |
| Module temperature low warning threshold | Module temperature low warning threshold. Warning ranges are vendor-specific. |
| Module voltage high alarm threshold | Module voltage high alarm threshold. Alarm ranges are vendor-specific. |
| Module voltage low alarm threshold | Module voltage low alarm threshold. Alarm ranges are vendor-specific. |
| Module voltage high warning threshold | Module voltage high warning threshold. Warning ranges are vendor-specific. |
| Module voltage low warning threshold | Module voltage low warning threshold. Warning ranges are vendor-specific. |
| Laser rx power high alarm threshold | Laser receive power high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser rx power low alarm threshold | Laser receive power low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser rx power high warning threshold | Laser receive power high warning threshold. Warning threshold ranges are vendor-specific. |
| Laser rx power high low threshold | Laser receive power high warning threshold. Warning threshold ranges are vendor-specific. |

Table 38 on page 171 lists the output fields for the **show interfaces diagnostics optics** command when the router is operating with XENPAK MSA optics. Output fields are listed in the approximate order in which they appear.

Table 38: XENPAK MSA Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|---------------------------------|---|
| Physical interface | Name of the physical interface. |
| Laser bias current | Measured laser bias current in mA. |
| Laser output power | Measured laser output power in mW. |
| Module temperature | Internally measured module temperature. |
| Laser rx power | Measured receive optical power in mW. |
| Laser bias current high alarm | Laser bias current high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current low alarm | Laser bias current low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser output power high alarm | Laser output power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser output power low alarm | Laser output power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp high alarm | Module temperature high alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp low alarm | Module temperature low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power high alarm | Laser receive power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power low alarm | Laser receive power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current high warning | Laser bias current high warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current low warning | Laser bias current low warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power high warning | Laser output power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power low warning | Laser output power low warning: On or Off. Warning ranges are vendor-specific. |
| Module temperature high warning | Module temperature high warning: On or Off. Warning ranges are vendor-specific. |
| Module temperature low warning | Module temperature low warning: On or Off. Warning ranges are vendor-specific. |

Table 38: XENPAK MSA Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| Laser rx power high warning | Laser receive power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power low warning | Laser receive power low warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current high alarm threshold | Laser bias current high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser bias current low alarm threshold | Laser bias current low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser output power high alarm threshold | Laser output power high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser output power low alarm threshold | Laser output power low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Module temperature high alarm threshold | Module temperature high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Module temperature low alarm threshold | Module temperature low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser rx power high alarm threshold | Laser receive power high alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser rx power low alarm threshold | Laser receive power low alarm threshold. Alarm threshold ranges are vendor-specific. |
| Laser bias current high warning threshold | Laser bias current high warning threshold. Warning ranges are vendor-specific. |
| Laser bias current low warning threshold | Laser bias current low warning threshold. Warning ranges are vendor-specific. |
| Laser output power high warning threshold | Laser output power high warning threshold. Warning ranges are vendor-specific. |
| Laser output power low warning threshold | Laser output power low warning threshold. Warning ranges are vendor-specific. |
| Module temperature high warning threshold | Module temperature high warning threshold. Warning ranges are vendor-specific. |
| Module temperature low warning threshold | Module temperature low warning threshold. Warning ranges are vendor-specific. |
| Laser rx power high warning threshold | Laser receive power high warning threshold. Warning threshold ranges are vendor-specific. |
| Laser rx power low warning threshold | Laser receive power low warning threshold. Warning threshold ranges are vendor-specific. |

Table 39 on page 173 lists the output fields for the `show interfaces diagnostics optics` command when the router is operating with XFP optics. Output fields are listed in the approximate order in which they appear.

Table 39: 10-Gigabit Ethernet XFP Optics `show interfaces diagnostics optics` Output Fields

| Field Name | Field Description |
|---------------------------------|--|
| Physical interface | Name of the physical interface. |
| Laser bias current | Magnitude of the laser bias power setting current, in milliamperes. The laser bias provides direct modulation of laser diodes and modulates currents. |
| Laser output power | Laser output power, in milliwatts (mW) and decibels, referenced to 1.0 mW (dBm). This is a software equivalent to the <code>LsPOWMON</code> pin in hardware. |
| Module temperature | Temperature of the XFP optics module, in Celsius and Fahrenheit. |
| Laser rx power | Laser received optical power, in mW and dBm. |
| Laser bias current high alarm | Laser bias power setting high alarm. Displays <code>on</code> or <code>off</code> . |
| Laser bias current low alarm | Laser bias power setting low alarm. Displays <code>on</code> or <code>off</code> . |
| Laser bias current high warning | Laser bias power setting high warning. Displays <code>on</code> or <code>off</code> . |
| Laser bias current low warning | Laser bias power setting low warning. Displays <code>on</code> or <code>off</code> . |
| Laser output power high alarm | Laser output power high alarm. Displays <code>on</code> or <code>off</code> . |
| Laser output power low alarm | Laser output power low alarm. Displays <code>on</code> or <code>off</code> . |
| Laser output power high warning | Laser output power high warning. Displays <code>on</code> or <code>off</code> . |
| Laser output power low warning | Laser output power low warning. Displays <code>on</code> or <code>off</code> . |
| Module temperature high alarm | Module temperature high alarm. Displays <code>on</code> or <code>off</code> . |
| Module temperature low alarm | Module temperature low alarm. Displays <code>on</code> or <code>off</code> . |
| Module temperature high warning | Module temperature high warning. Displays <code>on</code> or <code>off</code> . |
| Module temperature low warning | Module temperature low warning. Displays <code>on</code> or <code>off</code> . |

Table 39: 10-Gigabit Ethernet XFP Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---|--|
| Laser rx power high alarm | Receive laser power high alarm. Displays on or off. |
| Laser rx power low alarm | Receive laser power low alarm. Displays on or off. |
| Laser rx power high warning | Receive laser power high warning. Displays on or off. |
| Laser rx power low warning | Receive laser power low warning. Displays on or off. |
| Module not ready alarm | Module not ready alarm. When on, indicates the module has an operational fault. Displays on or off. |
| Module power down alarm | Module power down alarm. When on, module is in a limited power mode, low for normal operation. Displays on or off. |
| Tx data not ready alarm | Any condition leading to invalid data on the transmit path. Displays on or off. |
| Tx not ready alarm | Any condition leading to invalid data on the transmit path. Displays on or off. |
| Tx laser fault alarm | Laser fault condition. Displays on or off. |
| Tx CDR loss of lock alarm | Transmit clock and data recovery (CDR) loss of lock. Loss of lock on the transmit side of the CDR. Displays on or off. |
| Rx not ready alarm | Any condition leading to invalid data on the receive path. Displays on or off. |
| Rx loss of signal alarm | Receive Loss of Signal alarm. When on, indicates insufficient optical input power to the module. Displays on or off. |
| Rx CDR loss of lock alarm | Receive CDR loss of lock. Loss of lock on the receive side of the CDR. Displays on or off. |
| Laser bias current high alarm threshold | Vendor-specified threshold for the laser bias current high alarm: 130.000 mA. |
| Laser bias current low alarm threshold | Vendor-specified threshold for the laser bias current low alarm: 10.000 mA. |
| Laser bias current high warning threshold | Vendor-specified threshold for the laser bias current high warning: 120.000 mA. |
| Laser bias current low warning threshold | Vendor-specified threshold for the laser bias current low warning: 12.000 mA. |
| Laser output power high alarm threshold | Vendor-specified threshold for the laser output power high alarm: 0.8910 mW or -0.50 dBm. |
| Laser output power low alarm threshold | Vendor-specified threshold for the laser output power low alarm: 0.2230 mW or -6.52 dBm. |
| Laser output power high warning threshold | Vendor-specified threshold for the laser output power high warning: 0.7940 mW or -100 dBm. |

Table 39: 10-Gigabit Ethernet XFP Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| Laser output power low warning threshold | Vendor-specified threshold for the laser output power low warning: 0.2510 mW or -600 dBm. |
| Module temperature high alarm threshold | Vendor-specified threshold for the module temperature high alarm: 90° C or 194° F. |
| Module temperature low alarm threshold | Vendor-specified threshold for the module temperature low alarm: -5° C or 23° F. |
| Module temperature high warning threshold | Vendor-specified threshold for the module temperature high warning: 85 ° C or 185 ° F. |
| Module temperature low warning threshold | Vendor-specified threshold for the module temperature low warning: 0° C or 32° F. |
| Laser rx power high alarm threshold | Vendor-specified threshold for the laser Rx power high alarm: 1.2589 mW or 1.00 dBm. |
| Laser rx power low alarm threshold | Vendor-specified threshold for the laser Rx power low alarm: 0.0323 mW or -14.91 dBm. |
| Laser rx power high warning threshold | Vendor-specified threshold for the laser Rx power high warning: 1.1220 mW or 0.50 dBm. |
| Laser rx power low warning threshold | Vendor-specified threshold for the laser Rx power low warning: 0.0363 mW or -14.40 dBm. |

**show interfaces
diagnostics optics
(300-Pin MSA Optics)**

```
user@host> show interfaces diagnostics optics ge-5/0/0
Physical interface: ge-5/0/0
Laser bias current           : 79.938 mA
Laser output power          : 1.592 mW / 2.02 dBm
Receiver signal average optical power : 1.3854 mW / 1.42 dBm
Laser end-of-life alarm      : Off
Laser wavelength alarm       : Off
Laser bias current alarm     : Off
Laser temperature alarm      : Off
Laser power alarm            : Off
Modulator temperature alarm   : Off
Modulator bias alarm         : Off
Tx multiplexer FIFO error alarm : Off
Tx loss of PLL lock alarm    : Off
Rx loss of average optical power alarm: Off
Rx loss of AC power alarm    : Off
Rx loss of PLL lock alarm    : Off
```

**show interfaces
diagnostics optics
(Bidirectional SFP
Optics)**

```
user@host> show interfaces diagnostics optics ge-3/0/6
Physical interface: ge-3/0/6
Laser bias current           : 13.356 mA
Laser output power          : 0.2210 mW / -6.56 dBm
Module temperature          : 36 degrees C / 96 degrees F
Module voltage               : 3.2180 V
Receiver signal average optical power : 0.2429 mW / -6.15 dBm
Laser bias current high alarm : Off
Laser bias current low alarm  : Off
Laser bias current high warning : Off
Laser bias current low warning : Off
Laser output power high alarm : Off
Laser output power low alarm  : Off
Laser output power high warning : Off
Laser output power low warning : Off
Module temperature high alarm : Off
Module temperature low alarm  : Off
Module temperature high warning : Off
Module temperature low warning : Off
Module voltage high alarm     : Off
Module voltage low alarm      : Off
Module voltage high warning   : Off
Module voltage low warning    : Off
Laser rx power high alarm     : Off
Laser rx power low alarm      : Off
Laser rx power high warning   : Off
Laser rx power low warning    : Off
Laser bias current high alarm threshold : 70.000 mA
Laser bias current low alarm threshold : 0.002 mA
Laser bias current high warning threshold : 65.000 mA
Laser bias current low warning threshold : 0.002 mA
Laser output power high alarm threshold : 1.0000 mW / 0.00 dBm
Laser output power low alarm threshold : 0.0560 mW / -12.52 dBm
Laser output power high warning threshold : 0.6300 mW / -2.01 dBm
Laser output power low warning threshold : 0.0890 mW / -10.51 dBm
Module temperature high alarm threshold : 100 degrees C / 212 degrees F
Module temperature low alarm threshold : -50 degrees C / -58 degrees F
Module temperature high warning threshold : 95 degrees C / 203 degrees F
Module temperature low warning threshold : -48 degrees C / -54 degrees F
Module voltage high alarm threshold : 3.700 V
Module voltage low alarm threshold : 2.900 V
Module voltage high warning threshold : 3.600 V
Module voltage low warning threshold : 3.000 V
```

```

Laser rx power high alarm threshold      : 1.9953 mW / 3.00 dBm
Laser rx power low alarm threshold       : 0.0001 mW / -40.00 dBm
Laser rx power high warning threshold    : 1.0000 mW / 0.00 dBm
Laser rx power low warning threshold     : 0.0010 mW / -30.00 dBm

```

**show interfaces
diagnostics optics
(OTN Optics)**

```
user@host> show interfaces diagnostics optics ge-0/3/0
```

```
Physical interface: ge-0/3/0
```

```

Laser bias current                : 23.408 mA
Laser output power                 : 1.479 mW / 1.70 dBm
Module temperature                 : 37 degrees C / 99 degrees F
Laser rx power                    : 0.121 mW / -9.16 dBm
Laser bias current high alarm      : Off
Laser bias current low alarm       : Off
Laser output power high alarm      : Off
Laser output power low alarm       : Off
Module temperature high alarm      : Off
Module temperature low alarm       : Off
Laser rx power high alarm          : Off
Laser rx power low alarm           : Off
Laser bias current high warning    : Off
Laser bias current low warning     : Off
Laser output power high warning    : Off
Laser output power low warning     : Off
Module temperature high warning    : Off
Module temperature low warning     : Off
Laser rx power high warning        : Off
Laser rx power low warning         : Off
Laser bias current high alarm threshold : 31.000 mA
Laser bias current low alarm threshold : 10.000 mA
Laser output power high alarm threshold : 6.000 mW / 7.78 dBm
Laser output power low alarm threshold : 0.100 mW / -10.00 dBm
Module temperature high alarm threshold : 85 degrees C / 185 degrees F
Module temperature low alarm threshold : 0 degrees C / 32 degrees F
Laser rx power high alarm threshold : 1.000 mW / 0.00 dBm
Laser rx power low alarm threshold : 0.001 mW / -30.00 dBm
Laser bias current high warning threshold : 28.000 mA
Laser bias current low warning threshold : 11.000 mA
Laser output power high warning threshold : 5.000 mW / 6.99 dBm
Laser output power low warning threshold : 0.500 mW / -3.01 dBm
Module temperature high warning threshold : 70 degrees C / 158 degrees F
Module temperature low warning threshold : 10 degrees C / 50 degrees F
Laser rx power high warning threshold : 0.501 mW / -3.00 dBm
Laser rx power low warning threshold : 0.001 mW / -28.86 dBm

```

**show interfaces
diagnostics optics (SFP
MSA Optics)**

```
user@host> show interfaces diagnostics optics ge-1/0/0
```

```
Physical interface: ge-1/0/0
```

```

Laser bias current                : 49.010 mA
Laser output power                 : 1.263 mW / 1.01 dBm
Module temperature                 : 17 degrees C / 62 degrees F

Module voltage                     : 4.21 V
Laser rx power                    : 0.060 mW / -12.21 dBm
Laser bias current high alarm      : Off
Laser bias current low alarm       : Off
Laser output power high alarm      : Off
Laser output power low alarm       : Off
Module temperature high alarm      : Off
Module temperature low alarm       : Off
Module voltage high alarm          : Off
Module voltage low alarm           : Off
Laser rx power high alarm          : Off

```

```

Laser rx power low alarm           : Off
Laser bias current high warning    : Off
Laser bias current low warning     : Off
Laser output power high warning    : Off
Laser output power low warning     : Off
Module temperature high warning     : Off
Module temperature low warning      : Off
Module voltage high warning         : Off
Module voltage low warning          : Off
Laser rx power high warning         : Off
Laser rx power low warning          : Off
Laser bias current high alarm threshold : 70.000 mA
Laser bias current low alarm threshold : 20.000 mA
Laser bias current high warning threshold : 65.000 mA
Laser bias current low warning threshold : 25.000 mA
Laser output power high alarm threshold : 1.4120 mW / 1.50 dBm
Laser output power low alarm threshold : 0.1990 mW / -7.01 dBm
Laser output power high warning threshold : 1.2580 mW / 1.00 dBm
Laser output power low warning threshold : 0.2230 mW / -6.52 dBm
Module temperature high alarm threshold : 78 degrees C /172 degrees F

Module temperature low alarm threshold : 13 degrees C / 9 degrees F
Module temperature high warning threshold : 75 degrees C /167 degrees F

Module temperature low warning threshold : 10 degrees C / 14 degrees F

Module voltage high alarm threshold : 5.71 V
Module voltage low alarm threshold : 2.05 V
Module voltage high warning threshold : 5.20 V
Module voltage low warning threshold : 3.11 V
Laser rx power high alarm threshold : 1.7783 mW / 2.50 dBm
Laser rx power low alarm threshold : 0.0100 mW / -20.00 dBm
Laser rx power high warning threshold : 1.5849 mW / 2.00 dBm
Laser rx power low warning threshold : 0.0158 mW / -18.01 dBm

```

```

show interfaces      user@host> show interfaces diagnostics optics ge-1/0/0
diagnostics optics  Physical interface: ge-1/0/0
(XENPAK MSA Optics)
    Laser bias current          : 57.250 mA
    Laser output power          : 1.295 mW / 1.12 dBm
    Module temperature          : 24 degrees C / 76 degrees F
    Laser rx power              : 0.000 mW / -35.23 dBm
    Laser bias current high alarm : Off
    Laser bias current low alarm  : Off
    Laser output power high alarm : Off
    Laser output power low alarm  : Off
    Module temperature high alarm : Off
    Module temperature low alarm  : Off
    Laser rx power high alarm     : Off
    Laser rx power low alarm      : Off
    Laser bias current high warning : Off
    Laser bias current low warning : Off
    Laser output power high warning : Off
    Laser output power low warning : Off
    Module temperature high warning : Off
    Module temperature low warning : Off
    Laser rx power high warning    : Off
    Laser rx power low warning     : On
    Laser bias current high alarm threshold : 110.000 mA
    Laser bias current low alarm threshold  : 30.000 mA
    Laser output power high alarm threshold : 3.162 mW / 5.00 dBm
    Laser output power low alarm threshold  : 0.269 mW / -5.70 dBm
    Module temperature high alarm threshold : 80 degrees C / 176 degrees F
    Module temperature low alarm threshold  : -10 degrees C / 14 degrees F
    Laser rx power high alarm threshold     : 1.259 mW / 1.00 dBm
    Laser rx power low alarm threshold       : 0.005 mW / -23.01 dBm
    Laser bias current high warning threshold : 100.000 mA
    Laser bias current low warning threshold  : 40.000 mA
    Laser output power high warning threshold : 2.511 mW / 4.00 dBm
    Laser output power low warning threshold  : 0.338 mW / -4.71 dBm
    Module temperature high warning threshold : 75 degrees C / 167 degrees F
    Module temperature low warning threshold  : -5 degrees C / 23 degrees F
    Laser rx power high warning threshold     : 1.000 mW / 0.00 dBm
    Laser rx power low warning threshold       : 0.010 mW / -20.00 dBm

```

```

show interfaces      user@host> show interfaces diagnostics optics xe-2/1/0
diagnostics optics  Physical interface: xe-2/1/0
(XFP Optics)
    Laser bias current          : 52.060 mA
    Laser output power          : 0.5640 mW / -2.49 dBm
    Module temperature          : 31 degrees C / 88 degrees F
    Laser rx power              : 0.0844 mW / -10.74 dBm
    Laser bias current high alarm : Off
    Laser bias current low alarm  : Off
    Laser bias current high warning : Off
    Laser bias current low warning : Off
    Laser output power high alarm : Off
    Laser output power low alarm  : Off
    Laser output power high warning : Off
    Laser output power low warning : Off
    Module temperature high alarm : Off
    Module temperature low alarm  : Off
    Module temperature high warning : Off
    Module temperature low warning : Off
    Laser rx power high alarm     : Off
    Laser rx power low alarm      : Off
    Laser rx power high warning    : Off
    Laser rx power low warning     : Off

```

```

Module not ready alarm           : Off
Module power down alarm         : Off
Tx data not ready alarm         : Off
Tx not ready alarm              : Off
Tx laser fault alarm            : Off
Tx CDR loss of lock alarm       : Off
Rx not ready alarm              : Off
Rx loss of signal alarm         : Off
Rx CDR loss of lock alarm       : Off
Laser bias current high alarm threshold : 130.000 mA
Laser bias current low alarm threshold : 10.000 mA
Laser bias current high warning threshold : 120.000 mA
Laser bias current low warning threshold : 12.000 mA
Laser output power high alarm threshold : 0.8910 mW / -0.50 dBm
Laser output power low alarm threshold : 0.2230 mW / -6.52 dBm
Laser output power high warning threshold : 0.7940 mW / -1.00 dBm
Laser output power low warning threshold : 0.2510 mW / -6.00 dBm
Module temperature high alarm threshold : 90 degrees C / 194 degrees F
Module temperature low alarm threshold : -5 degrees C / 23 degrees F
Module temperature high warning threshold : 85 degrees C / 185 degrees F
Module temperature low warning threshold : 0 degrees C / 32 degrees F
Laser rx power high alarm threshold : 1.2589 mW / 1.00 dBm
Laser rx power low alarm threshold : 0.0323 mW / -14.91 dBm
Laser rx power high warning threshold : 1.1220 mW / 0.50 dBm
Laser rx power low warning threshold : 0.0363 mW / -14.40 dBm

```


show interfaces irb

| | |
|---------------------------------|--|
| Syntax | show interfaces irb <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced in JUNOS Release 8.4. |
| Description | Display integrated routing and bridging interfaces information. |
| Options | <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the interface with the specified SNMP index.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Additional Information | Integrated routing and bridging (IRB) provides simultaneous support for Layer 2 bridging and Layer 3 IP routing on the same interface. IRB enables you to route local packets to another routed interface or to another bridging domain that has a Layer 3 protocol configured. |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces irb extensive on page 185</p> <p>show interfaces irb snmp-index on page 186</p> |
| Output Fields | Table 40 on page 181 lists the output fields for the show interfaces irb command. Output fields are listed in the approximate order in which they appear. |

Table 40: show interfaces irb Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the physical interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Proto | Protocol configured on the interface. | terse |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 40: show interfaces irb Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|--------------------------------|
| Type | Physical interface type. | detail extensive none |
| Link-level type | Encapsulation being used on the physical interface. | detail extensive brief none |
| MTU | MTU size on the physical interface. | detail extensive brief none |
| Clocking | Reference clock source: Internal or External . Always unspecified on IRB interfaces. | detail extensive brief |
| Speed | Speed at which the interface is running. Always unspecified on IRB interfaces. | detail extensive brief |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | detail extensive brief none |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | detail extensive brief none |
| Link type | Physical interface link type: full duplex or half duplex . | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive none |
| Physical Info | Physical interface information. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | MAC address of the hardware. | detail extensive none |
| Alternate link address | Backup address of the link. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hours:minutes:seconds timezone (hours:minutes:seconds ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 40: show interfaces irb Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|--------------------------|
| IPv6 transit statistics | <p>Number of IPv6 transit bytes and packets received and transmitted on the physical interface if IPv6 statistics tracking is enabled.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | detail extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the DPC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface (which reflects its initialization sequence). | detail extensive none |
| SNMP ifIndex | SNMP interface index number of the logical interface. | detail extensive none |

Table 40: show interfaces irb Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | detail extensive |
| Encapsulation | Encapsulation on the logical interface. | detail extensive |
| Bandwidth | Speed at which the interface is running. | detail extensive |
| Routing Instance | Routing instance IRB is configured under. | detail extensive |
| Bridging Domain | Bridging domain IRB is participating in. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the logical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| IPv6 transit statistics | <p>Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. | detail extensive |
| Protocol | Protocol family configured on the logical interface. Possible values are described in “Protocol Field” on page 92. | detail extensive |
| MTU | Maximum transmission unit size on the logical interface. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Addresses, Flags | Information about address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive |
| Policer | The policer that is to be evaluated when packets are received or transmitted on the interface. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | detail extensive |

```

show interfaces irb      user@host> show interfaces irb extensive
extensive               Physical interface: irb, Enabled, Physical link is Up
                           Interface index: 129, SNMP ifIndex: 23, Generation: 130
                           Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
                           Speed: Unspecified
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps
                           Link type      : Full-Duplex
                           Link flags    : None
                           Physical info  : Unspecified
                           Hold-times     : Up 0 ms, Down 0 ms
                           Current address: 02:00:00:00:00:30, Hardware address: 02:00:00:00:00:30
                           Alternate link address: Unspecified
                           Last flapped   : Never
                           Statistics last cleared: Never
                           Traffic statistics:
                               Input bytes :                0
                               Output bytes:                0
                               Input packets:              0
                               Output packets:             0
                           IPv6 transit statistics:
                               Input bytes :                0
                               Output bytes :                0
                               Input packets:              0
                               Output packets:             0
                           Input errors:
                               Errors: 0, Drops: 0, Framing errors: 0, Runt: 0, Giants: 0, Policed discards:
0, Resource errors: 0
                           Output errors:
                               Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0, Resource errors:
0

                           Logical interface irb.0 (Index 68) (SNMP ifIndex 70) (Generation 143)
                           Flags: Hardware-Down SNMP-Traps 0x4000 Encapsulation: ENET2
                           Bandwidth: 1000mbps
                           Routing Instance: customer_0 Bridging Domain: bd0
                           Traffic statistics:
                               Input bytes :                0
                               Output bytes :                0
                               Input packets:              0
                               Output packets:             0
                           IPv6 transit statistics:
                               Input bytes :                0
                               Output bytes :                0
                               Input packets:              0
                               Output packets:             0
                           Local statistics:
                               Input bytes :                0
                               Output bytes :                0
                               Input packets:              0
                               Output packets:             0
                           Transit statistics:
                               Input bytes :                0                0 bps
                               Output bytes:                0                0 bps
                               Input packets:              0                0 pps
                               Output packets:             0                0 pps
                           IPv6 transit statistics:
                               Input bytes :                0
                               Output bytes :                0
                               Input packets:              0
                               Output packets:             0

```

```

Protocol inet, MTU: 1500, Generation: 154, Route table: 0
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 10.51.1/24, Local: 10.51.1.2, Broadcast: 10.51.1.255,
    Generation: 155
Protocol multiservice, MTU: 1500, Generation: 155, Route table: 0
  Flags: Is-Primary
  Policers: Input: __default_arp_policer

```

**show interfaces irb
snmp-index**

```

user@host> show interfaces snmp-index 25
Physical interface: irb, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 25
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Link flags     : None
  Current address: 02:00:00:00:00:30, Hardware address: 02:00:00:00:00:30
  Last flapped   : Never
    Input packets : 0
    Output packets: 0

Logical interface irb.0 (Index 68) (SNMP ifIndex 70)
  Flags: Hardware-Down SNMP-Traps 0x4000 Encapsulation: ENET2
  Bandwidth: 1000mbps
  Routing Instance: customer_0 Bridging Domain: bd0
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 1500
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
      Destination: 10.51.1/24, Local: 10.51.1.2, Broadcast: 10.51.1.255
  Protocol multiservice, MTU: 1500
    Flags: Is-Primary

```

show interfaces mac-database (Gigabit Ethernet)

| | |
|---------------------------------|---|
| Syntax | show interfaces mac-database (<i>ge-fpc/pic/port</i> <i>ge-fpc/pic/port.n</i>) <mac-address <i>mac-address</i> > |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series, T-series, and MX-series routing platforms only) Display media access control (MAC) address information for the specified Gigabit Ethernet interface. |
| Options | <p><i>ge-fpc/pic/port</i>—Display MAC addresses that have been learned on all logical interfaces on a particular physical interface.</p> <p><i>ge-fpc/pic/port.n</i>—Display MAC addresses that have been learned on a particular logical interface.</p> <p>mac-address <i>mac-address</i>—(Optional) Display detailed MAC address statistics, including policer information.</p> |
| Additional Information | On IQ2 PIC interfaces, the default value for maximum retention of entries in the MAC address table has changed, for cases in which the table is not full. The new holding time is 12 hours. The previous retention time of 3 minutes is still in effect when the table is full. |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces mac-database (All MAC Addresses on a Port) on page 188</p> <p>show interfaces mac-database (All MAC Addresses on a Service) on page 189</p> <p>show interfaces mac-database mac-address on page 189</p> |
| Output Fields | Table 41 on page 187 lists the output fields for the show interfaces mac-database command. Output fields are listed in the approximate order in which they appear. |

Table 41: show interfaces mac-database Output Fields

| Field Name | Field Description |
|---------------------------|---|
| Physical Interface | |
| Physical interface | Name of the physical interface. |
| Enabled | State of the physical interface. Possible values are described in “Enabled Field” on page 88. |
| Interface index | Physical interface index number, which reflects its initialization sequence. |
| SNMP ifIndex | SNMP index number for the physical interface. |
| Description | Description and name of the interface. |
| Link-level type | Encapsulation being used on the physical interface. |
| MTU | MTU size on the physical interface. |

Table 41: show interfaces mac-database Output Fields (continued)

| Field Name | Field Description |
|---|--|
| Speed | Speed at which the interface is running. |
| Loopback | Whether loopback is enabled and the type of loopback: local or remote . |
| Source filtering | Whether source filtering is configured. |
| Flow control | Whether flow control is enabled or disabled. |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. |
| Logical Interface | |
| Logical interface | Name of the logical interface. |
| Index | Logical interface index number, which reflects its initialization sequence. |
| SNMP ifIndex | Logical interface SNMP interface index number. |
| Flags | Information about the logical interface (possible values are described in “Logical Interface Flags” on page 91). |
| Encapsulation | Encapsulation on the logical interface. |
| MAC address, Input frames, Input bytes, Output frames, Output bytes | MAC address and corresponding number of input frames, input bytes, output frames, and output bytes. |
| Number of MAC addresses | Number of MAC addresses configured. |
| Policer Statistics | <p>(Displayed for mac-address option only) Display information about policers applied to a logical interface-MAC pair.</p> <ul style="list-style-type: none"> ■ Policer type—Type of policer that is out of spec with respect to the configuration. It can be one or more of the following: <ul style="list-style-type: none"> ■ Input premium—Number of high-priority rating out-of-spec frames or bytes received. ■ Output premium—Number of high-priority rating out-of-spec frames or bytes sent. ■ Input aggregate—Total number of out-of-spec frames or bytes received. ■ Output aggregate—Total number of out-of-spec frames or bytes sent. ■ Discarded Frames—Number of discarded frames. ■ Discarded Bytes—Number of discarded bytes. |

```

show interfaces      user@host> show interfaces mac-database ge-5/0/1
mac-database (All MAC Physical interface: ge-5/0/1, Enabled, Physical link is Down
Addresses on a Port)   Interface index: 161, SNMP ifIndex: 59
                        Description: horseshoe ge-2/2/1

```



```

Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, Loopback: Disabled,
Source filtering: Disabled,
Flow control: Enabled
Device flags   : Present Running Down
Interface flags: Hardware-Down SNMP-Traps 16384
Link flags     : None

```

```
Logical interface ge-5/0/1.0 (Index 68) (SNMP ifIndex 67)
```

```
Flags: Device-Down SNMP-Traps Encapsulation: ENET2
```

| MAC address | Input frames | Input bytes | Output frames | Output bytes |
|-------------------|--------------|-------------|---------------|--------------|
| 00:00:20:00:00:01 | 0 | 0 | 0 | 0 |
| 00:00:20:00:00:02 | 0 | 0 | 0 | 0 |
| 00:00:20:00:00:03 | 0 | 0 | 0 | 0 |
| 00:00:20:00:00:05 | 0 | 0 | 0 | 0 |

Number of MAC addresses : 4

**show interfaces
mac-database (All MAC
Addresses on a Service)**

```
user@host> show interfaces mac-database ge-5/0/1.0
```

```
Logical interface ge-5/0/1.0 (Index 68) (SNMP ifIndex 67)
```

```
Flags: Device-Down SNMP-Traps Encapsulation: ENET2
```

| MAC address | Input frames | Input bytes | Output frames | Output bytes |
|-------------------|--------------|-------------|---------------|--------------|
| 00:00:20:00:00:01 | 0 | 0 | 0 | 0 |
| 00:00:20:00:00:02 | 0 | 0 | 0 | 0 |
| 00:00:20:00:00:03 | 0 | 0 | 0 | 0 |
| 00:00:20:00:00:05 | 0 | 0 | 0 | 0 |

**show interfaces
mac-database
mac-address**

```
user@host> show interfaces mac-database ge-1/2/0 mac-address aa:bb:cc:dd:e0:00
```

```
Physical interface: ge-1/2/0, Enabled, Physical link is Up
```

```
Interface index: 142, SNMP ifIndex: 32
```

```
Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, Loopback: Disabled,  
Source filtering: Disabled, Flow control: Enabled
```

```
Device flags   : Present Running
```

```
Interface flags: SNMP-Traps 16384
```

```
Link flags     : None
```

```
Logical interface ge-1/2/0.0 (Index 68) (SNMP ifIndex 56)
```

```
Flags: SNMP-Traps 16384 Encapsulation: ENET2
```

```
MAC address: aa:bb:cc:dd:e0:00, Type: Configured,
```

```
Input bytes   : 0
```

```
Output bytes  : 0
```

```
Input frames  : 0
```

```
Output frames : 0
```

```
Policer statistics:
```

| Policer type | Discarded frames | Discarded bytes |
|--------------|------------------|-----------------|
|--------------|------------------|-----------------|

| | | |
|-----------------|---|---|
| Input aggregate | 0 | 0 |
|-----------------|---|---|

| | | |
|------------------|---|---|
| Output aggregate | 0 | 0 |
|------------------|---|---|

show oam ethernet connectivity-fault-management forwarding-state

| | |
|---------------------------------|---|
| Syntax | show oam ethernet connectivity-fault-management forwarding-state <brief detail extensive> interface <i>interface-name</i> instance <i>instance-name</i> <i>instance-name</i> |
| Release Information | Command introduced in JUNOS Release 8.4. |
| Description | On M320, MX-series, T320, and T640 routing platforms, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management forwarding state information for Ethernet interfaces. |
| Options | <p>brief detail extensive—(Optional) Display the specified level of output.</p> <p>interface <i>interface-name</i>—Display forwarding state information for a specified Ethernet interface only.</p> <p>instance <i>instance-name</i> <i>instance-name</i>—Display forwarding state information for a specified forwarding instance only.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show oam ethernet connectivity-fault-management forwarding-state instance on page 191</p> <p>show oam ethernet connectivity-fault-management forwarding-state interface on page 191</p> <p>show oam ethernet connectivity-fault-management forwarding-state interface detail on page 192</p> <p>show oam ethernet connectivity-fault-management forwarding-state interface <i>interface-name</i> on page 192</p> |
| Output Fields | Table 42 on page 190 lists the output fields for the show oam ethernet connectivity-fault-management forwarding-state command. Output fields are listed in the approximate order in which they appear. |

Table 42: show oam ethernet connectivity-fault-management forwarding-state Output Fields

| Field Name | Field Description | Level of Output |
|----------------|--|-----------------|
| Interface name | Interface identifier. | All levels |
| Link (Status) | Local link status. | All levels |
| Filter action | Filter action for messages at the level. | All levels |
| Next hop type | Next hop type. | All levels |
| Next index | Next hop index number. | brief |
| Level | Maintenance domain (MD) level. | detail |
| Direction | MEP direction configured. | none |

Table 42: show oam ethernet connectivity-fault-management forwarding-state Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------|--|-----------------|
| Instance name | Forwarding instance name. | All levels |
| CEs | Number of customer edge (CE) interfaces. | All levels |
| VEs | Number of VPN endpoint (VE) interfaces. | All levels |

```

show oam ethernet      user@host> show oam ethernet connectivity-fault-management forwarding-state
connectivity-fault-
management            instance
forwarding-state      Instance name: __+bd1__
instance              CEs: 3
                        VEs: 0
                        Maintenance domain forwarding state:

```

| Level | Direction | Filter action | Nexthop type | Nexthop index |
|-------|-----------|---------------|--------------|---------------|
| 0 | | Drop | none | |
| 1 | | Drop | none | |
| 2 | | Drop | none | |
| 3 | | Drop | none | |
| 4 | | Drop | none | |
| 5 | | Drop | none | |
| 6 | | Drop | none | |
| 7 | | Drop | none | |

```

show oam ethernet      user@host> show oam ethernet connectivity-fault-management forwarding-state
connectivity-fault-
management            interface
forwarding-state      Interface name: ge-3/0/0.0
interface              Instance name: __+bd1__
                        Maintenance domain forwarding state:

```

| Level | Direction | Filter action | Nexthop type | Nexthop index |
|-------|-----------|---------------|--------------|---------------|
| 0 | | Drop | none | |
| 1 | | Drop | none | |
| 2 | | Drop | none | |
| 3 | | Drop | none | |
| 4 | | Drop | none | |
| 5 | | Drop | none | |
| 6 | | Drop | none | |
| 7 | down | Receive | none | |

```

Interface name: xe-0/0/0.0
Instance name: __+bd1__
Maintenance domain forwarding state:

```

| Level | Direction | Filter action | Nexthop type | Nexthop index |
|-------|-----------|---------------|--------------|---------------|
| 0 | | Drop | none | |
| 1 | | Drop | none | |
| 2 | | Drop | none | |
| 3 | | Drop | none | |
| 4 | | Drop | none | |
| 5 | | Drop | none | |

| | | | |
|---|------|---------|------|
| 6 | | Drop | none |
| 7 | down | Receive | none |

show oam ethernet connectivity-fault-management forwarding-state interface detail
 user@host> **show oam ethernet connectivity-fault-management forwarding-state interface detail**
 Interface name: ge-3/0/0.0
 Instance name: __+bd1__

Level: 0
 Filter action: Drop
 Nexthop type: none

Level: 1
 Filter action: Drop
 Nexthop type: none

Level: 2
 Filter action: Drop
 Nexthop type: none

Level: 3
 Filter action: Drop
 Nexthop type: none

Level: 4
 Filter action: Drop
 Nexthop type: none

Level: 5
 Filter action: Drop
 Nexthop type: none

Level: 6
 Filter action: Drop
 Nexthop type: none

Level: 7
 Direction: down
 Filter action: Receive
 Nexthop type: none

Interface name: xe-0/0/0.0
 Instance name: __+bd1__

Level: 0
 Filter action: Drop
 Nexthop type: none

Level: 1
 Filter action: Drop
 Nexthop type: none

...

show oam ethernet connectivity-fault-management forwarding-state interface interface-name
 user@host> **show oam ethernet connectivity-fault-management forwarding-state interface interface-name ge-3/0/0/0.0**
 Interface name: ge-3/0/0.0
 Instance name: __+bd1__
 Maintenance domain forwarding state:

| Level | Direction | Filter action | Nexthop | Nexthop |
|-------|-----------|---------------|---------|---------|
|-------|-----------|---------------|---------|---------|

| | | | type | index |
|---|------|---------|------|-------|
| 0 | | Drop | none | |
| 1 | | Drop | none | |
| 2 | | Drop | none | |
| 3 | | Drop | none | |
| 4 | | Drop | none | |
| 5 | | Drop | none | |
| 6 | | Drop | none | |
| 7 | down | Receive | none | |

show oam ethernet connectivity-fault-management interfaces

| | |
|---------------------------------|--|
| Syntax | show oam ethernet connectivity-fault-management interfaces <brief detail extensive> <interface-name> <level md-level> |
| Release Information | Command introduced in JUNOS Release 8.4. |
| Description | On M320, MX-series, T320, and T640 routing platforms, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management information for Ethernet interfaces. |
| Options | <p>brief detail extensive—(Optional) Display the specified level of output.</p> <p>interface-name—(Optional) Display forwarding state information for a specified Ethernet interface only.</p> <p>level md-level—(Optional) Display forwarding state information for a specified maintenance domain level.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show oam ethernet connectivity-fault-management interfaces on page 196</p> <p>show oam ethernet connectivity-fault-management interfaces detail on page 196</p> <p>show oam ethernet connectivity-fault-management interfaces extensive on page 197</p> <p>show oam ethernet connectivity-fault-management interfaces level on page 197</p> |
| Output Fields | Table 43 on page 194 lists the output fields for the show oam ethernet connectivity-fault-management interfaces command. Output fields are listed in the approximate order in which they appear. |

Table 43: show oam ethernet connectivity-fault-management interfaces Output Fields

| Field Name | Field Description | Level of Output |
|------------------------------|--|------------------|
| Interface | Interface identifier. | All levels |
| Interface status | Local interface status. | All levels |
| Link status | Local link status. Up, down, or oam-down. | All levels |
| Maintenance domain name | Maintenance domain name. | detail extensive |
| Format (Maintenance domain) | Maintenance domain name format configured. | detail extensive |
| Level | Maintenance domain level configured. | All levels |
| Maintenance association name | Maintenance association name. | detail extensive |

Table 43: show oam ethernet connectivity-fault-management interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------------------|--|------------------|
| Format (Maintenance association) | Maintenance association name format configured. | detail extensive |
| Continuity-check status | Continuity-check status. | detail extensive |
| Interval | Continuity-check message interval. | detail extensive |
| Loss-threshold | Lost continuity-check message threshold. | detail extensive |
| MEP identifier | Maintenance association end point (MEP) identifier. | All levels |
| Neighbours | Number of MEP neighbors. | All levels |
| Direction | MEP direction configured. | detail extensive |
| MAC address | MAC address configured for the MEP. | detail extensive |
| MEP status | Indicates the status of the Connectivity Fault Management (CFM) protocol running on the MEP: Running , inactive , disabled , or unsupported . | detail extensive |
| Remote MEP not receiving CCM | Whether the remote MEP is not receiving connectivity check messages (CCMs). | detail extensive |
| Erroneous CCM received | Whether erroneous CCMs have been received. | detail extensive |
| Cross-connect CCM received | Whether cross-connect CCMs have been received. | detail extensive |
| RDI sent by some MEP | Whether the remote defect indication (RDI) bit is set in messages that have been received. The absence of the RDI bit in a CCM indicates that the transmitting MEP is receiving CCMs from all configured MEPs. | detail extensive |
| CCMs sent | Number of CCMs transmitted. | detail extensive |
| CCMs received out of sequence | Number of CCMs received out of sequence. | detail extensive |
| LBMs sent | Number of loopback request messages (LBMs) sent. | detail extensive |
| Valid in-order LBRs received | Number of loopback response messages (LBRs) received that were valid messages and in sequence. | detail extensive |
| Valid out-of-order LBRs received | Number of LBRs received that were valid messages and not in sequence. | detail extensive |
| LBRs received with corrupted data | Number of LBRs received that were corrupted. | detail extensive |
| LBRs sent | Number of LBRs transmitted. | detail extensive |
| LTMs sent | Linktrace messages (LTMs) transmitted. | detail extensive |

Table 43: show oam ethernet connectivity-fault-management interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------------------|--|------------------|
| LTM received | Linktrace messages received. | detail extensive |
| LTRs sent | Linktrace responses (LTRs) transmitted. | detail extensive |
| LTRs received | Linktrace responses received. | detail extensive |
| Sequence number of next LTM request | Sequence number of next LTM request to be transmitted. | detail extensive |
| Remote MEP count | Number of remote MEPs. | extensive |
| Identifier (remote MEP) | MEP identifier of the remote MEP. | extensive |
| MAC address (remote MEP) | MAC address of the remote MEP. | extensive |
| State (remote MEP) | State of the remote MEP. | extensive |
| Interface (remote MEP) | Interface of the remote MEP. | extensive |

```

show oam ethernet connectivity-fault-management interfaces
user@host> show oam ethernet connectivity-fault-management interfaces
Interface      Link      Status      Level      MEP      Neighbours
Identifier
ge-1/1/0.0     Up        Active      0          2        1
ge-1/1/0.1     Up        Active      0          2        1
ge-1/1/0.10    Up        Active      0          2        1
ge-1/1/0.100   Up        Active      0          2        1
ge-1/1/0.101   Up        Active      0          2        1
ge-1/1/0.102   Up        Active      0          2        1
ge-1/1/0.103   Up        Active      0          2        1
ge-1/1/0.104   Up        Active      0          2        1
ge-1/1/0.105   Up        Active      0          2        1
ge-1/1/0.106   Up        Active      0          2        1
...

```

```

show oam ethernet connectivity-fault-management interfaces detail
user@host> show oam ethernet connectivity-fault-management interfaces detail
Interface name: ge-5/2/9.0, Interface status: Active, Link status: Up
Maintenance domain name: md0, Format: string, Level: 5
Maintenance association name: ma1, Format: string
Continuity-check status: enabled, Interval: 100ms, Loss-threshold: 3 frames
MEP identifier: 1, Direction: down, MAC address: 00:90:69:0b:4b:94
MEP status: running
Defects:
  Remote MEP not receiving CCM                : no
  Erroneous CCM received                       : yes
  Cross-connect CCM received                   : no
  RDI sent by some MEP                        : yes
Statistics:
  CCMs sent                                   : 76
  CCMs received out of sequence               : 0

```



```

LBMs sent : 0
Valid in-order LBRs received : 0
Valid out-of-order LBRs received : 0
LBRs received with corrupted data : 0
LBRs sent : 0
LTMs sent : 0
LTMs received : 0
LTRs sent : 0
LTRs received : 0
Sequence number of next LTM request : 0
Remote MEP count: 2
Identifier  MAC address      State  Interface
2001      00:90:69:0b:7f:71   ok    ge-5/2/9.0
4001      00:90:69:0b:09:c5   ok    ge-5/2/9.0

```

**show oam ethernet
connectivity-fault-
management interfaces
extensive**

```

user@host> show oam ethernet connectivity-fault-management interfaces extensive
Interface name: ge-5/2/9.0, Interface status: Active, Link status: Up
Maintenance domain name: md0, Format: string, Level: 5
Maintenance association name: ma1, Format: string
Continuity-check status: enabled, Interval: 100ms, Loss-threshold: 3 frames
MEP identifier: 1, Direction: down, MAC address: 00:90:69:0b:4b:94
MEP status: running
Defects:
Remote MEP not receiving CCM : no
Erroneous CCM received : yes
Cross-connect CCM received : no
RDI sent by some MEP : yes
Statistics:
CCMs sent : 76
CCMs received out of sequence : 0
LBMs sent : 0
Valid in-order LBRs received : 0
Valid out-of-order LBRs received : 0
LBRs received with corrupted data : 0
LBRs sent : 0
LTMs sent : 0
LTMs received : 0
LTRs sent : 0
LTRs received : 0
Sequence number of next LTM request : 0
Remote MEP count: 2
Identifier  MAC address      State  Interface
2001      00:90:69:0b:7f:71   ok    ge-5/2/9.0
4001      00:90:69:0b:09:c5   ok    ge-5/2/9.0

```

**show oam ethernet
connectivity-fault-
management interfaces
level**

```

user@host> show oam ethernet connectivity-fault-management interfaces level 7
Interface  Link    Status    Level  MEP      Neighbours
Identifier
ge-3/0/0.0  Up      Active    7      201      0
xe-0/0/0.0  Up      Active    7      203      1

```

show lacp interfaces

| | |
|---------------------------------|---|
| Syntax | show lacp interfaces <i><interface-name></i> |
| Release Information | Command introduced in JUNOS Release 7.6. |
| Description | (M-series, T-series, and MX-series routing platforms only) Display Link Aggregation Control Protocol (LACP) information about the specified aggregated Ethernet, Fast Ethernet, or Gigabit Ethernet interface. |
| Options | <p>none—Display LACP information for all interfaces.</p> <p><i>interface-name</i>—(Optional) Display LACP information for the specified interface:</p> <ul style="list-style-type: none"> ■ Aggregated Ethernet—<i>aenumber</i> ■ Fast Ethernet—<i>fe-fpc/pic/port</i> ■ Gigabit Ethernet—<i>ge-fpc/pic/port</i> |
| Required Privilege Level | view |
| List of Sample Output | <p>show lacp interfaces (Aggregated Ethernet) on page 201</p> <p>show lacp interfaces (Gigabit Ethernet) on page 201</p> |
| Output Fields | Table 44 on page 198 lists the output fields for the show lacp interfaces command. Output fields are listed in the approximate order in which they appear. |

Table 44: show lacp interfaces Output Fields

| Field Name | Field Description |
|----------------------|-----------------------------|
| Aggregated interface | Aggregated interface value. |

Table 44: show lacp interfaces Output Fields (continued)

| Field Name | Field Description |
|------------|---|
| LACP State | <p>LACP state information for each aggregated interface:</p> <ul style="list-style-type: none"> ■ Role—Role played by the interface. It can be one of the following: <ul style="list-style-type: none"> ■ Actor—Local device participating in LACP negotiation. ■ Partner—Remote device participating in LACP negotiation. ■ Exp—Expired state. Yes indicates the actor or partner is in an expired state. No indicates the actor or partner is not in an expired state. ■ Def—Default. Yes indicates that the actor's receive machine is using the default operational partner information, administratively configured for the partner. No indicates the operational partner information in use has been received in an LACP PDU. ■ Dist—Distribution of outgoing frames. No indicates distribution of outgoing frames on the link is currently disabled and is not expected to be enabled. Otherwise, the value is Yes. ■ Col—Collection of incoming frames. Yes indicates collection of incoming frames on the link is currently enabled and is not expected to be disabled. Otherwise, the value is No. ■ Syn—Synchronization. If the value is Yes, the link is considered “in sync.” It has been allocated to the correct link aggregation group, the group has been associated with a compatible aggregator, and the identity of the link aggregation group is consistent with the system ID and operational key information transmitted. If the value is No, the link is currently “out of sync,” not in the right aggregation. ■ Aggr—Ability of aggregation port to aggregate (Yes) or to operate only as an individual link (No). ■ Timeout—LACP timeout preference. Periodic transmissions of LACP PDUs occur at either a slow or fast transmission rate, depending upon the expressed LACP timeout preference (Long Timeout or Short Timeout). ■ Activity—Actor or partner's port activity. Passive indicates the port's preference for not transmitting LAC PDUs unless its partner's control value is Active. Active indicates the port's preference to participate in the protocol regardless of the partner's control value. |

Table 44: show lacp interfaces Output Fields (continued)

| Field Name | Field Description |
|-----------------|--|
| LACP Protocol | <p>LACP protocol information for each aggregated interface:</p> <ul style="list-style-type: none"> ■ Link state (active or standby) indicated in parentheses next to the interface when link protection is configured. ■ Receive State—One of the following values: <ul style="list-style-type: none"> ■ Current—The state machine receives an LACP PDU and enters the Current state. ■ Defaulted—If no LACP PDU is received before the timer for the Current state expires a second time, the state machine enters the Defaulted state. ■ Expired—If no LACP PDU is received before the timer for the Current state expires once, the state machine enters the Expired state. ■ Initialize—When the physical connectivity of a link changes or a Begin event occurs, the state machine enters the Initialize state. ■ LACP Disabled—If the port is operating in half duplex, the operation of LACP is disabled on the port, forcing the state to LACP Disabled. This state is similar to the Defaulted state, except that the port is forced to operate as an individual port. ■ Port Disabled—If the port becomes inoperable and a Begin event has not occurred, the state machine enters the Port Disabled state. ■ Transmit State—Transmit state of state machine. One of the following values: <ul style="list-style-type: none"> ■ Fast Periodic—While in this state, periodic transmissions are enabled at a fast transmission rate. ■ No Periodic—While in this state, periodic transmissions are disabled. ■ Periodic Timer—Transitory state entered when the periodic timer expires. ■ Slow Periodic—While in this state, periodic transmissions are enabled at a slow transmission rate. ■ Mux State—State of the mux state machine for the aggregation port. The state is one of the following values: <ul style="list-style-type: none"> ■ Attached—Mux machine initiates the process of attaching the port to the selected aggregator. ■ Collecting—Yes indicates that the receive function of this link is enabled with respect to its participation in an aggregation. Received frames are passed to the aggregator for collection. No indicates the receive function of this link is not enabled. ■ Collecting Distributing—Collecting and distributing states are merged together to form a combined state (coupled control). Because independent control is not possible, the coupled control state machine does not wait for the partner to signal that collection has started before enabling both collection and distribution. ■ Detached—Process of detaching the port from the aggregator is in progress. ■ Distributing—Yes indicates that the transmit function of this link is enabled with respect to its participation in an aggregation. Frames may be passed down from the aggregator's distribution function for transmission. No indicates the transmit function of this link is not enabled. ■ Waiting—Mux state machine is in a holding process, awaiting an outcome. |
| LACP Statistics | <ul style="list-style-type: none"> ■ LACP Rx—Indicates the number of LACP receive packet errors logged. ■ LACP Tx—Indicates the number of LACP transmit packet errors logged. ■ Unknown Rx—Indicates the number of unrecognized packet errors logged. ■ Illegal Rx—Indicates the number of invalid packets received. |

**show lacp interfaces
(Aggregated Ethernet)**

user@host> show lacp interfaces ae0

Aggregated interface: ae0

| LACP state: | Role | Exp | Def | Dist | Col | Syn | Aggr | Timeout | Activity |
|-------------|---------|-----|-----|------|-----|-----|------|---------|----------|
| ge-1/0/1 | Actor | No | Yes | No | No | No | Yes | Fast | Active |
| ge-1/0/1 | Partner | No | Yes | No | No | No | Yes | Fast | Passive |
| ge-1/0/2 | Actor | No | Yes | No | No | No | Yes | Fast | Active |
| ge-1/0/2 | Partner | No | Yes | No | No | No | Yes | Fast | Passive |

| LACP protocol: | Receive State | Transmit State | Mux State |
|--------------------|---------------|----------------|------------|
| ge-1/0/1 | CURRENT | Fast periodic | Collecting |
| ge-1/0/2 | CURRENT | Fast periodic | Collecting |
| ge-1/0/1 (active) | CURRENT | Fast periodic | Collecting |
| ge-1/0/2 (standby) | CURRENT | Fast periodic | WAITING |

| LACP Statistics: | LACP Rx | LACP Tx | Unknown Rx | Illegal Rx |
|------------------|---------|---------|------------|------------|
| ge-1/0/1 | 0 | 0 | 0 | 0 |
| ge-1/0/2 | 0 | 0 | 0 | 0 |

**show lacp interfaces
(Gigabit Ethernet)**

user@host> show lacp interfaces ge-0/3/0

Aggregated interface: ae0

| LACP State: | Role | Exp | Def | Dist | Col | Syn | Aggr | Timeout | Activity |
|-------------|---------|-----|-----|------|-----|-----|------|---------|----------|
| ge-0/3/0 | Actor | No | No | Yes | Yes | Yes | Yes | Fast | Active |
| ge-0/3/0 | Partner | No | No | Yes | Yes | Yes | Yes | Fast | Active |

| LACP Protocol: | Receive State | Transmit State | Mux State |
|----------------|---------------|----------------|-------------------------|
| ge-0/3/0 | Current | Fast periodic | Collecting distributing |

show oam ethernet connectivity-fault-management mep-database

| | |
|---------------------------------|--|
| Syntax | show oam ethernet connectivity-fault-management mep-database <local-mep <i>local-mep-id</i> > <remote-mep <i>remote-mep-id</i> > maintenance-association <i>ma-name</i> maintenance-domain <i>domain-name</i> |
| Release Information | Command introduced in JUNOS Release 8.4. |
| Description | On M320, M120, MX-series, T320, and T640 routing platforms, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management maintenance association end point (MEP) database information. |
| Options | <p>local-mep <i>local-mep-id</i>—(Optional) Display connectivity fault management information for the specified local MEP only.</p> <p>remote-mep <i>remote-mep-id</i>—(Optional) Display connectivity fault management information for the specified remote MEP only.</p> <p>maintenance-association <i>ma-name</i>—Display connectivity fault management information for the specified maintenance association.</p> <p>maintenance-domain <i>domain-name</i>—Display connectivity fault management information for the specified maintenance domain.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show oam ethernet connectivity-fault-management mep-database on page 204</p> <p>show oam ethernet connectivity-fault-management mep-database local-mep remote-mep on page 205</p> |
| Output Fields | Table 45 on page 202 lists the output fields for the show oam ethernet connectivity-fault-management mep-database command. Output fields are listed in the approximate order in which they appear. |

Table 45: show oam ethernet connectivity-fault-management mep-database Output Fields

| Field Name | Field Description |
|----------------------------------|---|
| Maintenance domain name | Maintenance domain name. |
| Format (Maintenance domain) | Maintenance domain name format configured. |
| Level | Maintenance domain level configured. |
| Maintenance association name | Maintenance association name. |
| Format (Maintenance association) | Maintenance association name format configured. |

Table 45: show oam ethernet connectivity-fault-management mep-database Output Fields (continued)

| Field Name | Field Description |
|-----------------------------------|--|
| Continuity-check status | Continuity-check status. |
| Interval | Continuity-check message interval. |
| Loss-threshold | Lost continuity-check message threshold. |
| MEP identifier | Maintenance association end point (MEP) identifier. |
| Direction | MEP direction configured. |
| MAC address | MAC address configured for the MEP. |
| Auto-discovery | Whether automatic discovery is enabled or disabled. |
| Priority | Priority used for CCMs and linktrace messages transmitted by the MEP. |
| Interface name | Interface identifier. |
| Interface status | Local interface status. |
| Link status | Local link status. |
| Remote MEP not receiving CCM | Whether the remote MEP is not receiving CCMs. |
| Erroneous CCM received | Whether erroneous CCMs have been received. |
| Cross-connect CCM received | Whether cross-connect CCMs have been received. |
| RDI sent by some MEP | Whether the remote defect indication (RDI) bit is set in messages that have been received. The absence of the RDI bit in a CCM indicates that the transmitting MEP is receiving CCMs from all configured MEPs. |
| CCMs sent | Number of CCMs transmitted. |
| CCMs received out of sequence | Number of CCMs received out of sequence. |
| LBMs sent | Number of loopback messages (LBMs) sent. |
| Valid in-order LBRs received | Number of loopback response messages (LBRs) received that were valid messages and in sequence. |
| Valid out-of-order LBRs received | Number of LBRs received that were valid messages and not in sequence. |
| LBRs received with corrupted data | Number of LBRs received that were corrupted. |
| LBRs sent | Number of LBRs transmitted. |
| LTMs sent | Linktrace messages (LTMs) transmitted. |

Table 45: show oam ethernet connectivity-fault-management mep-database Output Fields (continued)

| Field Name | Field Description |
|-------------------------------------|---|
| LTM received | Linktrace messages received. |
| LTRs sent | Linktrace responses (LTRs) transmitted. |
| LTRs received | Linktrace responses received. |
| Sequence number of next LTM request | Sequence number of the next linktrace message request to be transmitted. |
| Remote MEP identifier | The MEP identifier of the remote MEP. |
| State (remote MEP) | State of the remote MEP: <i>idle</i> , <i>start</i> , <i>ok</i> , or <i>failed</i> . |
| MAC address | MAC address of the remote MEP. |
| Type | Whether the remote MEP MAC address was learned using automatic discovery or configured. |
| Interface | The interface of the remote MEP. A seven-digit number is appended if CFM is configured to run on a routing instance of type VPLS. |
| Last flapped | Date, time, and how long ago the remote MEP interface went from down to up. The format is <i>Last flapped: year-month-day hours:minutes:seconds timezone (hours:minutes:seconds ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . |
| Remote defect indication | Whether the remote defect indication (RDI) bit is set in messages that have been received/transmitted. |
| Port status TLV | The number of port status type length values (TLVs) received by the remote MEP in OAM protocol data units. |
| Interface status TLV | The number of interface status type length values (TLVs) received by the remote MEP in OAM protocol data units. |

**show oam ethernet
connectivity-fault-
management
mep-database**

```

user@host> show oam ethernet connectivity-fault-management mep-database
maintenance-domain vpls-vlan2000 maintenance-association vpls-vlan200
Maintenance domain name: vpls-vlan2000, Format: string, Level: 5
Maintenance association name: vpls-vlan200, Format: string
Continuity-check status: enabled, Interval: 100ms, Loss-threshold: 3 frames
MEP identifier: 200, Direction: up, MAC address: 00:19:e2:b0:74:01
Auto-discovery: enabled, Priority: 0
Interface name: ge-0/0/1.0, Interface status: Active, Link status: Up
Defects:
  Remote MEP not receiving CCM                : no
  Erroneous CCM received                      : no
  Cross-connect CCM received                  : no
  RDI sent by some MEP                       : no
Statistics:
  CCMs sent                                  : 1476
  CCMs received out of sequence              : 0
  LBMs sent                                  : 85
  Valid in-order LBRs received               : 78
  Valid out-of-order LBRs received          : 0
  LBRs received with corrupted data         : 0

```



```

LBRs sent : 0
LTMs sent : 1
LTMs received : 0
LTRs sent : 0
LTRs received : 1
Sequence number of next LTM request : 1
Remote MEP count: 1
Identifier    MAC address      State    Interface
  100      00:19:e2:b2:81:4b    ok  vt-0/1/10.1049088

```

```

show oam ethernet      user@host> show oam ethernet connectivity-fault-management mep-database
connectivity-fault- maintenance-domain vpls-vlan2000 maintenance-association vpls-vlan200 local-mep
management           200 remote-mep 100
mep-database local-mep
remote-mep
Maintenance domain name: vpls-vlan2000, Format: string, Level: 5
Maintenance association name: vpls-vlan200, Format: string
Continuity-check status: enabled, Interval: 100ms, Loss-threshold: 3 frames
MEP identifier: 200, Direction: up, MAC address: 00:19:e2:b0:74:01
Auto-discovery: enabled, Priority: 0
Interface name: ge-0/0/1.0, Interface status: Active, Link status: Up

Remote MEP identifier: 100, State: ok
MAC address: 00:19:e2:b2:81:4b, Type: Learned
Interface: vt-0/1/10.1049088
Last flapped: Never
Remote defect indication: false
Port status TLV: none
Interface status TLV: none

```

show oam ethernet connectivity-fault-management mip

| | |
|---------------------------------|---|
| Syntax | show oam ethernet connectivity-fault-management mip <qualifier> |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On the MX-series, display all the Maintenance Intermediate Points (MIPs) created in the system. Qualifiers also available to display specific MIPs. |
| Required Privilege Level | View |
| Output Fields | Table 46 on page 206 lists the output fields for the show oam ethernet connectivity-fault-management mip command. Output fields are listed in the approximate order in which they appear. |

Table 46: show oam ethernet connectivity-fault-management mip Output Fields

| Field Name | Field Description |
|------------------------------|--|
| MIP information for instance | Header for the MIP information showing the MIP name. |
| Interface | Interface type-dpc/pic/port.unit-number. |
| Level | MIP level configured. |

```

show oam ethernet user@host> show oam ethernet connectivity-fault-management mip
connectivity-fault-management MIP information for instance __mip_name__
mip MIP information for instance default-switch bd1

      Interface      Level
      ge-3/0/0.0     7
      ge-3/0/1.0     6
      ge-3/0/3.0     6
MIP information for instance vpls-1

      Interface      Level
      ge-3/0/2.0     7
      ge-3/0/4.0     6

```

show oam ethernet link-fault-management

| | |
|---------------------------------|--|
| Syntax | show oam ethernet link-fault-management <brief detail> <interface-name> |
| Release Information | Command introduced in JUNOS Release 8.2. |
| Description | On M320, M120, MX-series, T320, and T640 routing platforms, display Operation, Administration, and Management (OAM) link fault management information for Ethernet interfaces. |
| Options | brief detail—(Optional) Display the specified level of output. interface-name—(Optional) Display link fault management information for the specified Ethernet interface only. |
| Required Privilege Level | view |
| List of Sample Output | show oam ethernet link-fault-management brief on page 210 show oam ethernet link-fault-management detail on page 211 |
| Output Fields | Table 47 on page 207 lists the output fields for the show oam ethernet link-fault-management command. Output fields are listed in the approximate order in which they appear. |

Table 47: show oam ethernet link-fault-management Output Fields

| Field Name | Field Description | Level of Output |
|-----------------|--|-----------------|
| Status | Indicates the status of the established link. <ul style="list-style-type: none"> ■ Fail—A link fault condition exists. ■ Running—A link fault condition does not exist. | All levels |
| Discovery state | State of the discovery mechanism: <ul style="list-style-type: none"> ■ Passive Wait ■ Send Any ■ Send Local Remote ■ Send Local Remote Ok | All levels |
| Peer address | Address of the OAM peer. | All levels |

Table 47: show oam ethernet link-fault-management Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------------|--|-----------------|
| Flags | <p>Information about the interface. Possible values are described in “Link Flags” on page 91.</p> <ul style="list-style-type: none"> ■ Remote-Stable—Indicates remote OAM client acknowledgment of and satisfaction with local OAM state information. False indicates that remote DTE either has not seen or is unsatisfied with local state information. True indicates that remote DTE has seen and is satisfied with local state information. ■ Local-Stable—Indicates local OAM client acknowledgment of and satisfaction with remote OAM state information. False indicates that local DTE either has not seen or is unsatisfied with remote state information. True indicates that local DTE has seen and is satisfied with remote state information. ■ Remote-State-Valid—Indicates the OAM client has received remote state information found within Local Information TLVs of received Information OAM PDUs. False indicates that OAM client has not seen remote state information. True indicates that the OAM client has seen remote state information. | All levels |
| Remote loopback status | Indicates the remote loopback status. An OAM entity can put its remote peer into loopback mode using the Loopback control OAM PDU. In loopback mode, every frame received is transmitted back on the same port (except for OAM PDUs, which are needed to maintain the OAM session). | All levels |
| Remote entity information | <p>Remote entity information.</p> <ul style="list-style-type: none"> ■ Remote MUX action—Indicates the state of the multiplexer functions of the OAM sublayer. Device is forwarding non-OAM PDUs to the lower sublayer or discarding non-OAM PDUs. ■ Remote parser action—Indicates the state of the parser function of the OAM sublayer. Device is forwarding non-OAM PDUs to higher sublayer, looping back non-OAM PDUs to the lower sublayer, or discarding non-OAM PDUs. ■ Discovery mode—Indicates whether discovery mode is active or inactive. ■ Unidirectional mode—Indicates the ability to operate a link in a unidirectional mode for diagnostic purposes. ■ Remote loopback mode—Indicates whether remote loopback is supported or unsupported. ■ Link events—Indicates whether interpreting link events is supported or unsupported on the remote peer. ■ Variable requests—Indicates whether variable requests are supported. The Variable Request OAM PDU, is used to request one or more MIB variables from the remote peer. | All levels |
| OAM Receive Statistics | | |
| Information | The total number of information PDUs received. | detail |
| Event | The total number of loopback control PDUs received. | detail |
| Variable request | The total number of variable request PDUs received. | detail |
| Variable response | The total number of variable response PDUs received. | detail |

Table 47: show oam ethernet link-fault-management Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|---|-----------------|
| Loopback control | The total number of loopback control PDUs received. | detail |
| Organization specific | The total number of vendor organization specific PDUs received. | detail |
| OAM Transmit Statistics | | |
| Information | The total number of information PDUs transmitted. | detail |
| Event | The total number of event notification PDUs transmitted. | detail |
| Variable request | The total number of variable request PDUs transmitted. | detail |
| Variable response | The total number of variable response PDUs transmitted. | detail |
| Loopback control | The total number of loopback control PDUs transmitted. | detail |
| Organization specific | The total number of vendor organization specific PDUs transmitted. | detail |
| OAM Received Symbol Error Event information | | |
| Events | The number of symbol error event TLVs that have been received since the OAM sublayer was reset. | detail |
| Window | The symbol error event window in the received PDU. The protocol default value is the number of symbols that can be received in one second on the underlying physical layer. | detail |
| Threshold | The number of errored symbols in the period required for the event to be generated. | detail |
| Errors in period | The number of symbol errors in the period reported in the received event PDU. | detail |
| Total errors | The number of errored symbols that have been reported in received event TLVs since the OAM sublayer was reset. Symbol errors are coding symbol errors. | detail |
| OAM Received Frame Error Event Information | | |
| Events | The number of errored frame event TLVs that have been received since the OAM sublayer was reset. | detail |
| Window | The duration of the window in terms of the number of 100 ms period intervals. | detail |
| Threshold | The number of detected errored frames required for the event to be generated. | detail |
| Errors in period | The number of detected errored frames in the period. | detail |
| Total errors | The number of errored frames that have been reported in received event TLVs since the OAM sublayer was reset. A frame error is any frame error on the underlying physical layer. | detail |

Table 47: show oam ethernet link-fault-management Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|---|-----------------|
| OAM Received Frame Period Error Event Information | | |
| Events | The number of frame seconds errors event TLVs that have been received since the OAM sublayer was reset. | detail |
| Window | The duration of the frame seconds window. | detail |
| Threshold | The number of frame seconds errors in the period. | detail |
| Errors in period | The number of frame seconds errors in the period. | detail |
| Total errors | The number of frame seconds errors that have been reported in received event TLVs since the OAM sublayer was reset. | detail |
| OAM Transmitted Symbol Error Event Information | | |
| Events | The number of symbol error event TLVs that have been transmitted since the OAM sublayer was reset. | detail |
| Window | The symbol error event window in the transmitted PDU. | detail |
| Threshold | The number of errored symbols in the period required for the event to be generated. | detail |
| Errors in period | The number of symbol errors in the period reported in the transmitted event PDU. | detail |
| Total errors | The number of errored symbols reported in event TLVs that have been transmitted since the OAM sublayer was reset. | detail |
| OAM Transmitted Frame Error Event Information | | |
| Events | The number of errored frame event TLVs that have been transmitted since the OAM sublayer was reset. | detail |
| Window | The duration of the window in terms of the number of 100 ms period intervals. | detail |
| Threshold | The number of detected errored frames required for the event to be generated. | detail |
| Errors in period | The number of detected errored frames in the period. | detail |
| Total errors | The number of errored frames that have been detected since the OAM sublayer was reset. | detail |

**show oam ethernet
link-fault-management
brief**

```

user@host> show oam ethernet link-fault-management brief
Interface: ge-3/1/3
Status: Running, Discovery state: Send Any
Peer address: 00:90:69:72:2c:83
Flags:Remote-Stable Remote-State-Valid Local-Stable 0x50
Remote loopback status: Disabled on local port, Enabled on peer port
Remote entity information:
  Remote MUX action: discarding, Remote parser action: loopback
  Discovery mode: active, Unidirectional mode: unsupported

```

Remote loopback mode: supported, Link events: supported
Variable requests: unsupported

**show oam ethernet
link-fault-management
detail**

```
user@host> show oam ethernet link-fault-management detail
Interface: ge-6/1/0
Status: Running, Discovery state: Send Any
Peer address: 00:90:69:0a:07:14
Flags:Remote-Stable Remote-State-Valid Local-Stable 0x50
OAM receive statistics:
  Information: 186365, Event: 0, Variable request: 0, Variable response: 0
  Loopback control: 0, Organization specific: 0
OAM transmit statistics:
  Information: 186347, Event: 0, Variable request: 0, Variable response: 0
  Loopback control: 0, Organization specific: 0
OAM received symbol error event information:
  Events: 0, Window: 0, Threshold: 0
  Errors in period: 0, Total errors: 0
OAM received frame error event information:
  Events: 0, Window: 0, Threshold: 0
  Errors in period: 0, Total errors: 0
OAM received frame period error event information:
  Events: 0, Window: 0, Threshold: 0
  Errors in period: 0, Total errors: 0
OAM transmitted symbol error event information:
  Events: 0, Window: 0, Threshold: 1
  Errors in period: 0, Total errors: 0
OAM transmitted frame error event information:
  Events: 0, Window: 0, Threshold: 1
  Errors in period: 0, Total errors: 0
Remote entity information:
  Remote MUX action: forwarding, Remote parser action: forwarding
  Discovery mode: active, Unidirectional mode: unsupported
  Remote loopback mode: supported, Link events: supported
  Variable requests: unsupported
```

show oam ethernet connectivity-fault-management linktrace path-database

| | |
|---------------------------------|---|
| Syntax | show oam ethernet connectivity-fault-management linktrace path-database mac-address maintenance-association <i>ma-name</i> maintenance-domain <i>md-name</i> |
| Release Information | Command introduced in JUNOS Release 9.0. |
| Description | On M320, MX-series, T320, and T640 routing platforms, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management maintenance linktrace database information. |
| Options | <p>mac-address—Display connectivity fault management path database information for the specified MAC address of the remote host.</p> <p>maintenance-association <i>ma-name</i>—Display connectivity fault management path database information for the specified maintenance association.</p> <p>maintenance-domain <i>md-name</i>—Display connectivity fault management path database information for the specified maintenance domain.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show oam ethernet connectivity-fault-management linktrace path-database on page 213</p> <p>show oam ethernet connectivity-fault-management linktrace path-database (Two traceroute Commands) on page 213</p> |
| Output Fields | Table 48 on page 212 lists the output fields for the show oam ethernet connectivity-fault-management linktrace path-database command. Output fields are listed in the approximate order in which they appear. |

Table 48: show oam ethernet connectivity-fault-management linktrace path-database Output Fields

| Field Name | Field Description |
|-------------------------|---|
| Linktrace to | MAC address of the 802.1ag node to which the linktrace message is targeted. |
| Interface | Interface used by the local MEP to send the linktrace message (LTM). |
| Maintenance Domain | Maintenance domain identifier specified in the traceroute command. |
| Maintenance Association | Maintenance association identifier specified in the traceroute command. |
| Level | Maintenance domain level configured for the maintenance domain. |
| Local Mep | MEP identifier of the local MEP originating the linktrace. |
| Hop | Sequential hop count of the linktrace path. |
| TTL | Number of hops remaining in the linktrace message (LTM). The time to live (TTL) is decremented at each hop. |
| Source MAC address | MAC address of the 802.1ag maintenance intermediate point (MIP) that is forwarding the LTM. |

Table 48: show oam ethernet connectivity-fault-management linktrace path-database Output Fields (continued)

| Field Name | Field Description |
|------------------------|---|
| Next hop MAC address | MAC address of the 802.1ag node that is the next hop in the LTM path. |
| Transaction Identifier | A 4-byte identifier maintained by the MEP. Each LTM uses a transaction identifier. The transaction identifier is maintained globally across all maintenance domains. Use the transaction identifier to match an incoming linktrace responses (LTR), with a previously sent LTM. |

**show oam ethernet
connectivity-fault-
management linktrace
path-database**

```
user@host> show oam ethernet connectivity-fault-management linktrace path-database
maintenance-domain MD1 maintenance-association MA1 00:01:02:03:04:05
Linktrace to 00:01:02:03:04:05, Interface : ge-5/0/0.0
Maintenance Domain: MD1, Level: 7
Maintenance Association: MA1, Local Mep: 1
```

| Hop | TTL | Source MAC address | Next hop MAC address |
|-------------------------------|-----|--------------------|----------------------|
| Transaction Identifier:100001 | | | |
| 1 | 63 | 00:00:aa:aa:aa:aa | 00:00:bb:bb:bb:bb |
| 2 | 62 | 00:00:bb:bb:bb:bb | 00:00:cc:cc:cc:cc |
| 3 | 61 | 00:00:cc:cc:cc:cc | 00:01:02:03:04:05 |
| 4 | 60 | 00:01:02:03:04:05 | 00:00:00:00:00:00 |

**show oam ethernet
connectivity-fault-
management linktrace
path-database (Two
traceroute Commands)**

```
user@host> show oam ethernet connectivity-fault-management linktrace path-database
maintenance-domain MD2 maintenance-association MA2 00:06:07:08:09:0A
Linktrace to 00:06:07:08:09:0A, Interface : ge-5/0/1.0
Maintenance Domain: MD2, Level: 6
Maintenance Association: MA2, Local Mep: 10
```

| Hop | TTL | Source MAC address | Next hop MAC address |
|-------------------------------|-----|--------------------|----------------------|
| Transaction Identifier:100002 | | | |
| 1 | 63 | 00:00:aa:aa:aa:aa | 00:00:bb:bb:bb:bb |
| 2 | 62 | 00:00:bb:bb:bb:bb | 00:00:cc:cc:cc:cc |
| 3 | 61 | 00:00:cc:cc:cc:cc | 00:06:07:08:09:0A |
| 4 | 60 | 00:06:07:08:09:0A | 00:00:00:00:00:00 |
| Transaction Identifier:100003 | | | |
| 1 | 63 | 00:00:aa:aa:aa:aa | 00:00:bb:bb:bb:bb |
| 2 | 62 | 00:00:bb:bb:bb:bb | 00:00:cc:cc:cc:cc |
| 3 | 61 | 00:00:cc:cc:cc:cc | 00:06:07:08:09:0A |
| 4 | 60 | 00:06:07:08:09:0A | 00:00:00:00:00:00 |

show oam ethernet connectivity-fault-management path-database

| | |
|---------------------------------|--|
| Syntax | show oam ethernet connectivity-fault-management path-database <host-mac-address> <maintenance-association <i>ma-name</i> > <maintenance-domain <i>domain-name</i> > |
| Release Information | Command introduced in JUNOS Release 8.4. |
| Description | On M320, MX-series, T320, and T640 routing platforms, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management path database information for a host configured with an MEP. |
| Options | <p><i>host-mac-address</i>—(Optional) Display connectivity fault management path database information for a specified Ethernet host.</p> <p><i>maintenance-association ma-name</i>—(Optional) Display connectivity fault management path database information for the specified maintenance association.</p> <p><i>maintenance-domain domain-name</i>—(Optional) Display connectivity fault management path database information for the specified maintenance domain.</p> |
| Required Privilege Level | view |
| List of Sample Output | show oam ethernet connectivity-fault-management path-database on page 215 |
| Output Fields | Table 49 on page 214 lists the output fields for the <code>show oam ethernet connectivity-fault-management path-database</code> command. Output fields are listed in the approximate order in which they appear. |

Table 49: show oam ethernet connectivity-fault-management path-database Output Fields

| Field Name | Field Description |
|------------------------------|---|
| Linktrace to | MAC address of the remote MEPs in the path. |
| Interface | Interface identifier. |
| Maintenance domain name | Maintenance domain name. |
| Format (Maintenance domain) | Maintenance domain name format configured. |
| Level | Maintenance domain level configured. |
| Maintenance association name | Maintenance association name. |
| Local Mep | Local MEP identifier. |

```

show oam ethernet      user@host> show oam ethernet connectivity-fault-management path-database
connectivity-fault-management maintenance-domain md1 maintenance-association ma1 00:05:85:79:39:ef
path-database          Linktrace to 00:05:85:79:39:ef, Interface : ge-3/0/0
                           Maintenance Domain: md1, Level: 7
                           Maintenance Association: ma1, Local Mep: 201

```

show protection-group ethernet-ring aps

| | |
|---------------------------------|--|
| Syntax | show protection-group ethernet-ring aps |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On MX-series routers, displays the status of the Automatic Protection Switching (APS) and Ring APS (RAPS) messages on an Ethernet ring. |
| Required Privilege Level | view |
| List of Sample Output | show protection-group ethernet-ring aps (owner node, normal operation) on page 216 show protection-group ethernet-ring aps (ring node, normal operation) on page 216 show protection-group ethernet-ring aps (owner node, failure condition) on page 217 show protection-group ethernet-ring aps (ring node, failure condition) on page 217 |
| Output Fields | Table 50 on page 216 lists the output fields for the show protection-group ethernet-ring aps command. Output fields are listed in the approximate order in which they appear. |

Table 50: show protection-group ethernet-ring aps Output Fields

| Field Name | Field Description |
|------------------------------|---|
| Ethernet Ring Name | The name configured for the Ethernet ring. |
| Request/State | The status of the Ethernet ring RAPS messages. <ul style="list-style-type: none"> ■ NR—Indicates there is no request for APS on the ring. ■ SF—Indicates there is a signal failure on the ring. |
| No Flush | State of the ring flushing: No (normal) or Yes (failure). |
| Ring Protection Link Blocked | Blocking on the ring protection link: Yes or No. |
| Originator | Is this node the ring originator? Yes or No. |
| Remote Node ID | Identifier (in MAC address format) of the remote node. |

```

show protection-group ethernet-ring aps (owner node, normal operation)
user@host> show protection-group ethernet-ring aps
Ethernet Ring Name  Request/state  No Flush  Ring Protection Link Blocked
pg101              NR             No        Yes

Originator  Remote Node ID
Yes
```

```

show protection-group ethernet-ring aps (ring node, normal operation)
user@host> show protection-group ethernet-ring aps
Ethernet Ring Name  Request/state  No Flush  Ring Protection Link Blocked
pg102              NR             No        Yes

Originator  Remote Node ID
No          00:01:01:00:00:01
```

```

show protection-group      user@host> show protection-group ethernet-ring aps
ethernet-ring aps (owner   Ethernet Ring Name  Request/state  No Flush  Ring Protection Link Blocked
node, failure condition)  pg101              SF              No        No

                               Originator  Remote Node ID
                               No         00:01:02:00:00:01

show protection-group      user@host> show protection-group ethernet-ring aps
ethernet-ring aps (ring   Ethernet Ring Name  Request/state  No Flush  Ring Protection Link Blocked
node, failure condition)  pg102              SF              No        Yes

                               Originator  Remote Node ID
                               Yes         00:00:00:00:00:00

```

show protection-group ethernet-ring interface

| | |
|---------------------------------|--|
| Syntax | show protection-group ethernet-ring interface |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On MX-series routers, displays the status of the Automatic Protection Switching (APS) interfaces on an Ethernet ring. |
| Required Privilege Level | view |
| List of Sample Output | show protection-group ethernet-ring interface (owner node, normal operation) on page 218 show protection-group ethernet-ring interface (ring node, normal operation) on page 219 show protection-group ethernet-ring interface (owner node, failure condition) on page 219 show protection-group ethernet-ring interface (ring node, failure condition) on page 219 |
| Output Fields | Table 51 on page 218 lists the output fields for the show protection-group ethernet-ring interface command. Output fields are listed in the approximate order in which they appear. |

Table 51: show protection-group ethernet-ring interface Output Fields

| Field Name | Field Description |
|--|--|
| Ethernet ring port parameters for protection group <i>group-name</i> | The output is organized by configured protection group. |
| Interface | The physical interfaces configured for the Ethernet ring. |
| Control Channel | The logical unit configured on the physical interface. ■ NR—Indicates there is no request for APS on the ring. ■ SF—Indicates there is a signal failure on the ring. |
| Forwarding State | State of the ring forwarding on the interface: discarding or forwarding. |
| Ring Protection Link End | Is this interface the end of the ring? Yes or No. |
| Signal Failure | Is there a signal failure on the link? Ckear or Set. |
| Admin State | State of the interface: IFF ready or IFF disabled. |

```

show protection-group ethernet-ring interface
(owner node, normal operation)
user@host> show protection-group ethernet-ring interface
Ethernet ring port parameters for protection group pg101

Interface    Control Channel  Forward State  Ring Protection Link End
ge-1/0/1     ge-1/0/1.1      discarding    Yes
ge-1/2/4     ge-1/2/4.1      forwarding    No

Signal Failure  Admin State

```

```
Clear          IFF ready
Clear          IFF ready
```

**show protection-group
ethernet-ring interface
(ring node, normal
operation)**

```
user@host> show protection-group ethernet-ring interface
Ethernet ring port parameters for protection group pg102
```

| Interface | Control Channel | Forward State | Ring Protection Link End |
|-----------|-----------------|---------------|--------------------------|
| ge-1/2/1 | ge-1/2/1.1 | forwarding | No |
| ge-1/0/2 | ge-1/0/2.1 | forwarding | No |

```
Signal Failure Admin State
Clear          IFF ready
Clear          IFF ready
```

**show protection-group
ethernet-ring interface
(owner node, failure
condition)**

```
user@host> show protection-group ethernet-ring interface
Ethernet ring port parameters for protection group pg101
```

| Interface | Control Channel | Forward State | Ring Protection Link End |
|-----------|-----------------|---------------|--------------------------|
| ge-1/0/1 | ge-1/0/1.1 | forwarding | Yes |
| ge-1/2/4 | ge-1/2/4.1 | forwarding | No |

```
Signal Failure Admin State
Clear          IFF ready
Clear          IFF ready
```

**show protection-group
ethernet-ring interface
(ring node, failure
condition)**

```
user@host> show protection-group ethernet-ring interface
Ethernet ring port parameters for protection group pg102
```

| Interface | Control Channel | Forward State | Ring Protection Link End |
|-----------|-----------------|---------------|--------------------------|
| ge-1/2/1 | ge-1/2/1.1 | forwarding | No |
| ge-1/0/2 | ge-1/0/2.1 | discarding | No |

```
Signal Failure Admin State
Clear          IFF ready
Set            IFF ready
```

show protection-group ethernet-ring node-state

| | |
|---------------------------------|--|
| Syntax | show protection-group ethernet-ring node-state |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On MX-series routers, displays the status of the Automatic Protection Switching (APS) nodes on an Ethernet ring. |
| Required Privilege Level | view |
| List of Sample Output | show protection-group ethernet-ring node-state (owner node, normal operation) on page 221 show protection-group ethernet-ring node-state (ring node, normal operation) on page 221 show protection-group ethernet-ring node-state (owner node, failure condition) on page 221 show protection-group ethernet-ring node-state (ring node, failure condition) on page 221 |
| Output Fields | Table 52 on page 220 lists the output fields for the <code>show protection-group ethernet-ring node-state</code> command. Output fields are listed in the approximate order in which they appear. |

Table 52: show protection-group ethernet-ring node-state Output Fields

| Field Name | Field Description |
|----------------------------|---|
| Ethernet Ring Name | The name configured for the Ethernet ring. |
| APS State | The state of the Ethernet ring APS. <ul style="list-style-type: none"> ■ idle—Indicates there is no APS on the ring. ■ protected—Indicates there is a protection switch on the ring. |
| Event | Events on the ring. <ul style="list-style-type: none"> ■ NR-RB—Indicates there is no APS request and the ring link is blocked on the ring owner node. ■ NR—Indicates there is no APS request on the ring non-owner nodes. ■ SF—Indicates there is signal failure on a node link. |
| Ring Protection Link Owner | Is this node the ring owner? Yes or No . |
| Restore Timer | Is this node using a restoration timer? Enabled or Disabled . |
| Guard Timer | Is this node using a guard timer? Enabled or Disabled . |
| Operational State | State of the node: Operational or Non-operational . |


```

show protection-group
ethernet-ring node-state
(owner node, normal
operation)
user@host> show protection-group ethernet-ring node-state
Ethernet ring   APS State   Event       Ring Protection Link Owner
pg101           idle        NR-RB       Yes

Restore Timer   Quard Timer   Operation state
disabled        disabled      operational

show protection-group
ethernet-ring node-state
(ring node, normal
operation)
user@host> show protection-group ethernet-ring node-state
Ethernet ring   APS State   Event       Ring Protection Link Owner
pg102           idle        NR-RB       No

Restore Timer   Quard Timer   Operation state
disabled        disabled      operational

show protection-group
ethernet-ring node-state
(owner node, failure
condition)
user@host> show protection-group ethernet-ring node-state
Ethernet ring   APS State   Event       Ring Protection Link Owner
pg101           protected   SF          Yes

Restore Timer   Quard Timer   Operation state
disabled        disabled      operational

show protection-group
ethernet-ring node-state
(ring node, failure
condition)
user@host> show protection-group ethernet-ring node-state
Ethernet ring   APS State   Event       Ring Protection Link Owner
pg102           idle        NR-RB       No

Restore Timer   Quard Timer   Operation state
disabled        disabled      operational

```

show protection-group ethernet-ring statistics

| | |
|---------------------------------|--|
| Syntax | show protection-group ethernet-ring statistics <group-name <i>group-name</i> > |
| Release Information | Command introduced in JUNOS Release 9.4. |
| Description | On MX-series routers, displays statistics regarding Automatic Protection Switching (APS) protection groups on an Ethernet ring. |
| Options | <i>group-name</i> —Protection group for which to display statistics. In you omit this optional field, all protection group statistics for configured groups will be displayed. |
| Required Privilege Level | view |
| List of Sample Output | show protection-group ethernet-ring statistics (owner node, normal operation) on page 222 show protection-group ethernet-ring statistics (ring node, normal operation) on page 223 show protection-group ethernet-ring statistics (owner node, failure condition) on page 223 show protection-group ethernet-ring statistics (ring node, failure condition) on page 223 |
| Output Fields | Table 53 on page 222 lists the output fields for the show protection-group ethernet-ring statistics command. Output fields are listed in the approximate order in which they appear. |

Table 53: show protection-group ethernet-ring statistics Output Fields

| Field Name | Field Description |
|---------------------------------|--|
| Ethernet Ring Statistics for PG | The name of the protection group for which statistics are displayed. |
| RAPS sent | Number of Ring Automatic Protection Switching (RAPS) messages sent. |
| RAPS received | Number of RAPS messages received. |
| Local SF happened | Number of times a signal failure (SF) has occurred locally. |
| Remote SF happened | Number of times a signal failure (SF) has occurred anywhere else on the ring. |
| NR event happened | Number of times a No Request (NR) event has occurred on the ring. |
| NR-RB event happened | Number of times a No Request, Ring Blocked (NR-RB) event has occurred on the ring. |

```

show protection-group user@host> show protection-group ethernet-ring statistics group-name pg101
ethernet-ring statistics Ethernet Ring statistics for PG pg101
(owner node, normal RAPS sent : 1
operation) RAPS received : 0
Local SF happened: : 0
Remote SF happened: : 0

```

```
NR event happened:           : 0
NR-RB event happened:        : 1
```

```
show protection-group user@host> show protection-group ethernet-ring statistics group-name pg102
ethernet-ring statistics Ethernet Ring statistics for PG pg102
(ring node, normal RAPS sent : 0
operation) RAPS received : 1
Local SF happened: : 0
Remote SF happened: : 0
NR event happened: : 0
NR-RB event happened: : 1
```

```
show protection-group user@host> show protection-group ethernet-ring statistics group-name pg101
ethernet-ring statistics Ethernet Ring statistics for PG pg101
(owner node, failure RAPS sent : 1
condition) RAPS received : 1
Local SF happened: : 0
Remote SF happened: : 1
NR event happened: : 0
NR-RB event happened: : 1
```

```
show protection-group user@host> show protection-group ethernet-ring statistics group-name pg102
ethernet-ring statistics Ethernet Ring statistics for PG pg102
(ring node, failure RAPS sent : 1
condition) RAPS received : 1
Local SF happened: : 1
Remote SF happened: : 0
NR event happened: : 0
NR-RB event happened: : 1
```

traceroute ethernet

Syntax traceroute ethernet (*mac-address* | *mep-id*)
 maintenance-association *ma-name*
 maintenance-domain *md-name*
 ttl *value*
 <wait *seconds*>

Release Information Command introduced in JUNOS Release 9.0.
 mep-id option introduced in JUNOS Release 9.1.

Description Triggers the linktrace protocol to trace the route between two maintenance points. The result of the traceroute protocol is stored in the path database. To display the path database, use the `show oam ethernet connectivity-fault-management path-database` command.

Before using the traceroute command, you can verify the remote MEP's MAC address using the `show oam ethernet connectivity-fault-management path-database` command.

Options *mac-address*—Destination unicast MAC address of the remote maintenance point.

mep-id—MEP identifier of the remote maintenance point. The range of values is 1 through 8191.

maintenance-association ma-name—Specifies an existing maintenance association from the set of configured maintenance associations.

maintenance-domain md-name—Specifies an existing maintenance domain from the set of configured maintenance domains.

ttl value—Number of hops to use in the linktrace request. The range is 1 to 255 hops. The default is 4.

wait seconds—Maximum time to wait for a response to the traceroute request. The range is 1 to 255 seconds. The default is 5.

Required Privilege Level network

List of Sample Output traceroute ethernet on page 225

Output Fields Table 54 on page 224 lists the output fields for the `traceroute ethernet` command. Output fields are listed in the approximate order in which they appear.

Table 54: traceroute ethernet Output Fields

| Field Name | Field Description |
|--------------------|---|
| Linktrace to | MAC address of the destination maintenance point. |
| Interface | Local interface used to send the linktrace message (LTM). |
| Maintenance Domain | Maintenance domain specified in the traceroute command. |

Table 54: traceroute ethernet Output Fields *(continued)*

| Field Name | Field Description |
|-------------------------|--|
| Level | Maintenance domain level configured. |
| Maintenance Association | Maintenance association specified in the traceroute command. |
| Local Mep | The local maintenance end point identifier. |
| Transaction Identifier | A 4-byte identifier maintained by the MEP. Each LTM uses a transaction identifier. The transaction identifier is maintained globally across all Maintenance Domains. Use the transaction identifier to match an incoming linktrace response (LTR), with a previously sent LTM. |
| Hop | Sequential hop count of the linktrace path. |
| TTL | Number of hops remaining in the linktrace message. The time to live (TTL) is decremented at each hop. |
| Source MAC address | MAC address of the 802.1ag maintenance point that is sending the linktrace message. |
| Next-hop MAC address | MAC address of the 802.1ag node that is the next hop in the LTM path. |

```

traceroute ethernet user@host> traceroute ethernet maintenance-domain md1 maintenance-association ma1
00:90:69:7e:01:ff
Linktrace to 00:01:02:03:04:05, Interface : ge-5/0/0.0
Maintenance Domain: MD1, Level: 7
Maintenance Association: MA1, Local Mep: 1

Hop      TTL      Source MAC address      Next hop MAC address
Transaction Identifier:100001
1         63      00:00:aa:aa:aa:aa      00:00:bb:bb:bb:bb
2         62      00:00:bb:bb:bb:bb      00:00:cc:cc:cc:cc
3         61      00:00:cc:cc:cc:cc      00:01:02:03:04:05
4         60      00:01:02:03:04:05      00:00:00:00:00:00

```


Chapter 5

VRRP Operational Mode Commands

Table 55 on page 227 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Virtual Router Redundancy Protocol (VRRP) on Ethernet, Fast Ethernet, Gigabit Ethernet, 10-Gigabit Ethernet, and logical tunnel interfaces. Commands are listed in alphabetical order.

Table 55: VRRP Operational Mode Commands

| Task | Command |
|----------------------------------|------------|
| Clear (set to zero) VRRP groups. | clear vrrp |
| Display VRRP groups. | show vrrp |

clear vrrp

Syntax clear vrrp (all | *interface-name*)

Release Information Command introduced before JUNOS Release 7.4.

Description Set Virtual Router Redundancy Protocol (VRRP) interface statistics to zero.

Options all—Clear statistics on all interfaces.

interface-name—Clear statistics on the specified interface only.

Required Privilege Level clear

Related Topics show vrrp

List of Sample Output clear vrrp all on page 228

Output Fields When you enter this command, you are provided feedback on the status of your request.

clear vrrp all user@host> clear vrrp all

show vrrp

| | |
|---------------------------------|--|
| Syntax | show vrrp <brief detail extensive summary> <interface <i>interface-name</i> <group number>> <logical-system (<i>logical-system-name</i> all)> <track <interfaces>> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about Virtual Router Redundancy Protocol (VRRP) groups. |
| Options | <p>none—(Same as brief) Display brief status information about all VRRP interfaces.</p> <p>brief detail extensive summary—(Optional) Display the specified level of output.</p> <p>interface <i>interface-name</i> <group number>—(Optional) Display information and status about the specified VRRP interface, and, optionally, group number.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>track <interfaces>—(Optional) Display information and status about VRRP track interfaces.</p> |
| Required Privilege Level | view |
| Related Topics | clear vrrp |
| List of Sample Output | <p>show vrrp on page 233</p> <p>show vrrp brief on page 234</p> <p>show vrrp detail (IPv6) on page 234</p> <p>show vrrp detail (Route Track) on page 234</p> <p>show vrrp extensive on page 234</p> <p>show vrrp interface on page 236</p> <p>show vrrp summary on page 237</p> <p>show vrrp track detail on page 237</p> <p>show vrrp track summary on page 237</p> |
| Output Fields | Table 56 on page 229 lists the output fields for the show vrrp command. Output fields are listed in the approximate order in which they appear |

Table 56: show vrrp Output Fields

| Field Name | Field Description | Level of Output |
|-----------------|--|------------------------------|
| Interface | Name of the logical interface. | brief extensive none summary |
| Interface index | Physical interface index number, which reflects its initialization sequence. | extensive |
| Groups | Total number of VRRP groups configured on the interface. | extensive |

Table 56: show vrrp Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------------------|--|--------------------------------|
| Active | Total number of VRRP groups that are active (that is, whose interface state is either up or down). | extensive |
| Interface VRRP PDU statistics | Nonerrored statistics for the logical interface: <ul style="list-style-type: none"> ■ Advertisement sent—Number of VRRP advertisement protocol data units (PDUs) that the interface has transmitted. ■ Advertisement received—Number of VRRP advertisement PDUs received by the interface. ■ Packets received—Number of VRRP packets received for VRRP groups on the interface. ■ No group match received—Number of VRRP packets received for VRRP groups that do not exist on the interface. | extensive |
| Interface VRRP PDU error statistics | Errored statistics for the logical interface: <ul style="list-style-type: none"> ■ Invalid IPAH next type received—Number of packets received that use the IP Authentication Header protocol (IPAH) and that do not encapsulate VRRP packets. ■ Invalid VRRP ttl value received—Number of packets received whose IP time-to-live (TTL) value is not 255. ■ Invalid VRRP version received—Number of packets received whose VRRP version is not 2. ■ Invalid VRRP pdu type received—Number of packets received whose VRRP PDU type is not 1. ■ Invalid VRRP authentication type received—Number of packets received whose VRRP authentication is not none, simple, or md5. ■ Invalid VRRP IP count received—Number of packets received whose VRRP IP count exceeds 8. ■ Invalid VRRP checksum received—Number of packets received whose VRRP checksum does not match the calculated one. | extensive |
| Physical interface | Name of the physical interface. | detail extensive |
| Unit | Logical unit number. | All levels |
| Address | Address of the physical interface. | brief detail extensive none |
| Index | Physical interface index number, which reflects its initialization sequence. | detail extensive |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive |
| VRRP-Traps | Status of VRRP traps: Enabled or Disabled . | detail extensive |
| Type and Address | Identifier for the address and the address itself: <ul style="list-style-type: none"> ■ lcl—Configured local interface address. ■ mas—Address of the master virtual router. This address is displayed only when the local interface is acting as a backup router. ■ vip—Configured virtual IP addresses. | brief none summary |

Table 56: show vrrp Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------------------|--|---------------------------------|
| Interface state or Int state | State of the physical interface: <ul style="list-style-type: none"> ■ down—The device is present and the link is unavailable. ■ not present—The interface is configured, but no physical device is present. ■ unknown—The VRRP process has not had time to query the kernel about the state of the interface. ■ up—The device is present and the link is established. | brief extensive none summary |
| Group | VRRP group number. | brief extensive none summary |
| State | VRRP state: <ul style="list-style-type: none"> ■ backup—The interface is acting as the backup router interface. ■ bringup—VRRP is just starting, and the physical device is not yet present. ■ idle—VRRP is configured on the interface and is disabled. This can occur when VRRP is first enabled on an interface whose link is established. ■ initializing—VRRP is initializing. ■ master—The interface is acting as the master router interface. ■ transition—The interface is changing between being the backup and being the master router. | extensive |
| Priority | Configured VRRP priority for the interface. | detail extensive |
| Advertisement interval | Configured VRRP advertisement interval. | detail extensive |
| Authentication type | Configured VRRP authentication type: none , simple , or md5 . | detail extensive |
| Preempt | Whether preemption is allowed on the interface: yes or no . | detail extensive |
| Accept-data mode | Whether the interface is configured to accept packets destined for the virtual IP address: yes or no . | detail extensive |
| VIP count | Number of virtual IP addresses that have been configured on the interface. | detail extensive |
| VIP | List of virtual IP addresses configured on the interface. | detail extensive |
| Advertisement timer | How long, in seconds, until the advertisement timer expires. | detail extensive |
| Master router | IP address of the interface that is acting as the master. If the VRRP interface is down, the output is N/A. | detail extensive |
| Virtual router uptime | How long, in seconds, that the virtual router has been up. | detail extensive |
| Master router uptime | How long, in seconds, that the master route has been up. | detail extensive |
| Virtual MAC | MAC address associated with the virtual IP address. | detail extensive |
| Tracking | Whether tracking is enabled or disabled . | detail extensive |

Table 56: show vrrp Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------------|--|------------------|
| Current priority | Current operational priority for being the VRRP master. | detail extensive |
| Configured priority | Configured base priority for being the VRRP master. | detail extensive |
| Priority hold-time | Minimum time interval, in seconds, between successive changes to the current priority. Disabled indicates no minimum interval. | detail extensive |
| Remaining-time | (track option only) Displays the time remaining in the priority hold-time interval. | detail |
| Interface tracking | Whether interface tracking is enabled or disabled. When enabled, the output also displays the number of tracked interfaces. | detail extensive |
| Interface/Tracked interface | Name of the tracked interface. | detail extensive |
| Int state/Interface state | Current operational state of the tracked interface: up or down . | detail extensive |
| Int speed/Speed | Current operational speed, in bits per second, of the tracked interface. | detail extensive |
| Incurred priority cost | Operational priority cost incurred due to the state and speed of this tracked interface. This cost is applied to the configured priority to obtain the current priority. | detail extensive |
| Threshold | Speed below which the corresponding priority cost is incurred. In other words, when the speed of the interface drops below the threshold speed, the corresponding priority cost is incurred. An entry of down means that the corresponding priority cost is incurred when the interface is down. | detail extensive |
| Route tracking | Whether route tracking is enabled or disabled. When enabled, the output also displays the number of tracked routes. | detail extensive |
| Route count | The number of routes being tracked. | detail extensive |
| Route | The IP address of the route being tracked. | detail extensive |
| VRF name | The VPN routing and forwarding (VRF) routing instance that the tracked route is in. | detail extensive |
| Route state | The state of the route being tracked: up , down , or unknown . | detail extensive |
| Priority cost | Configured priority cost. This value is incurred when the interface speed drops below the corresponding threshold or when the tracked route goes down. | detail extensive |
| Active | Whether the threshold is active (*). If the threshold is active, the corresponding priority cost is incurred. | detail extensive |
| Group VRRP PDU statistics | Number of VRRP advertisements sent and received by the group. | extensive |

Table 56: show vrrp Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------------------|--|--------------------|
| Group VRRP PDU error statistics | <p>Errored statistics for the VRRP group:</p> <ul style="list-style-type: none"> ■ Bad authentication type received—Number of VRRP PDUs received with an invalid authentication type. The received authentication can be none, simple, or md5 and must be the same for all routing platforms in the VRRP group. ■ Bad password received—Number of VRRP PDUs received with an invalid key (password). The password for simple authentication must be the same for all routing platforms in the VRRP group ■ Bad MD5 digest received—Number of VRRP PDUs received for which the MD5 digest computed from the VRRP PDU differs from the digest expected by the VRRP instance configured on the router. ■ Bad advertisement timer received—Number of VRRP PDUs received with an advertisement time interval that is inconsistent with the one in use among the routers in the VRRP group. ■ Bad VIP count received—Number of VRRP PDUs whose virtual IP address counts differ from the count that has been configured on the VRRP instance. ■ Bad VIPADDR received—Number of VRRP PDUs whose virtual IP addresses differ from the list of virtual IP addresses configured on the VRRP instance. | extensive |
| Group state transition statistics | <p>State transition statistics for the VRRP group:</p> <ul style="list-style-type: none"> ■ Idle to master transitions—Number of times that the VRRP instance transitioned from the idle state to the master state. ■ Idle to backup transitions—Number of times that the VRRP instance transitioned from the idle state to the backup state. ■ Backup to master transitions—Number of times that the VRRP instance transitioned from the backup state to the master state. ■ Master to backup transitions—Number of times that the VRRP instance transitioned from the master state to the backup state. | extensive |
| VR state | <p>VRRP information:</p> <ul style="list-style-type: none"> ■ backup—The interface is acting as the backup router interface. ■ bringup—VRRP is just starting, and the physical device is not yet present. ■ idle—VRRP is configured on the interface and is disabled. This can occur when VRRP is first enabled on an interface whose link is established. ■ initializing—VRRP is initializing. ■ master—The interface is acting as the master router interface. ■ transition—The interface is changing between being the backup and being the master router. | brief none summary |
| Timer | <p>VRRP timer information:</p> <ul style="list-style-type: none"> ■ A—How long, in seconds, until the advertisement timer expires. ■ D—How long, in seconds, until the Master is Dead timer expires. | brief none |

```
show vrrp user@host> show vrrp
```

| Interface | State | Group | VR state | Timer | Type | Address |
|--------------|-------|-------|----------|---------|------|-----------------|
| fe-0/0/0.121 | up | 1 | master | A 1.052 | 1c1 | fec0::12:1:1:1 |
| | | | | | vip | fe80::12:1:1:99 |
| fe-0/0/2.131 | up | 1 | master | A 0.364 | 1c1 | fec0::13:1:1:1 |
| | | | | | vip | fe80::13:1:1:99 |
| | | | | | vip | fec0::13:1:1:99 |

show vrrp brief The output for the `show vrrp brief` command is identical to that for the `show vrrp` command. For sample output, see `show vrrp` on page 233

show vrrp detail (IPv6) user@host> `show vrrp detail`
Physical interface: fe-0/0/0, Unit: 121, Vlan-id: 212, Address: fec0::12:1:1:1/120

Index: 67, SNMP ifIndex: 45, VRRP-Traps: enabled
Interface state: up, Group: 1, State: master
Priority: 200, Advertisement interval: 1, Authentication type: none
Preempt: yes, Accept-data mode: no, VIP count: 2, VIP: fe80::12:1:1:99, fec0::12:1:1:99
Advertisement timer: 1.121s, Master router: fe80::12:1:1:1
Virtual router uptime: 00:03:47, Master router uptime: 00:03:41
Virtual MAC: 00:00:5e:00:02:01
Tracking: disabled

Physical interface: fe-0/0/2, Unit: 131, Vlan-id: 213, Address: fec0::13:1:1:1/120

Index: 69, SNMP ifIndex: 47, VRRP-Traps: enabled
Interface state: up, Group: 1, State: master
Priority: 200, Advertisement interval: 1, Authentication type: none
Preempt: yes, Accept-data mode: no, VIP count: 2, VIP: fe80::13:1:1:99, fec0::13:1:1:99
Advertisement timer: 0.327s, Master router: fe80::13:1:1:1
Virtual router uptime: 00:03:47, Master router uptime: 00:03:41
Virtual MAC: 00:00:5e:00:02:01
Tracking: disabled

show vrrp detail (Route Track) user@host> `show vrrp detail`
Physical interface: ge-1/2/0, Unit: 0, Address: 30.30.30.30/24

Index: 67, SNMP ifIndex: 379, VRRP-Traps: enabled
Interface state: up, Group: 100, State: master
Priority: 150, Advertisement interval: 1, Authentication type: none
Preempt: yes, Accept-data mode: no, VIP count: 1, VIP: 30.30.30.100
Advertisement timer: 1.218s, Master router: 30.30.30.30
Virtual router uptime: 00:04:28, Master router uptime: 00:00:13
Virtual MAC: 00:00:5e:00:01:64
Tracking: enabled
Current priority: 150, Configured priority: 150
Priority hold-time: disabled
Interface tracking: disabled
Route tracking: enabled, Route count: 1

| Route | VRF name | Route state | Priority cost |
|-----------------|----------|-------------|---------------|
| 192.168.40.0/22 | default | up | 30 |

show vrrp extensive user@host> `show vrrp extensive`
Interface: fe-0/0/0.121, Interface index: 67, Groups: 1, Active : 1
Interface VRRP PDU statistics

```

Advertisement sent           :          188
Advertisement received        :           0
Packets received             :           0
No group match received      :           0
Interface VRRP PDU error statistics
Invalid IPAH next type received :           0
Invalid VRRP TTL value received :           0
Invalid VRRP version received  :           0
Invalid VRRP PDU type received :           0
Invalid VRRP authentication type received:           0
Invalid VRRP IP count received :           0
Invalid VRRP checksum received :           0

```

Physical interface: fe-0/0/0, Unit: 121, Vlan-id: 212, Address: fec0::12:1:1:1/120

Index: 67, SNMP ifIndex: 45, VRRP-Traps: enabled
Interface state: up, Group: 1, State: master
Priority: 200, Advertisement interval: 1, Authentication type: none
Preempt: yes, Accept-data mode: no, VIP count: 2, VIP: fe80::12:1:1:99,
fec0::12:1:1:99

```

Advertisement timer: 1.034s, Master router: fe80::12:1:1:1
Virtual router uptime: 00:04:04, Master router uptime: 00:03:58
Virtual MAC: 00:00:5e:00:02:01
Tracking: disabled
Group VRRP PDU statistics
  Advertisement sent           :          188
  Advertisement received        :           0
Group VRRP PDU error statistics
Bad authentication type received:           0
Bad password received           :           0
Bad MD5 digest received         :           0
Bad advertisement timer received:           0
Bad VIP count received          :           0
Bad VIPADDR received            :           0
Group state transition statistics
Idle to master transitions      :           0
Idle to backup transitions      :           1
Backup to master transitions    :           1
Master to backup transitions    :           0

```

Interface: fe-0/0/2.131, Interface index: 69, Groups: 1, Active : 1

```

Interface VRRP PDU statistics
Advertisement sent           :          186
Advertisement received        :           0
Packets received             :           0
No group match received      :           0
Interface VRRP PDU error statistics
Invalid IPAH next type received :           0
Invalid VRRP TTL value received :           0
Invalid VRRP version received  :           0
Invalid VRRP PDU type received :           0
Invalid VRRP authentication type received:           0
Invalid VRRP IP count received :           0
Invalid VRRP checksum received :           0

```

Physical interface: fe-0/0/2, Unit: 131, Vlan-id: 213, Address: fec0::13:1:1:1/120

Index: 69, SNMP ifIndex: 47, VRRP-Traps: enabled
Interface state: up, Group: 1, State: master
Priority: 200, Advertisement interval: 1, Authentication type: none
Preempt: yes, Accept-data mode: no, VIP count: 2, VIP: fe80::13:1:1:99,

```

fec0::13:1:1:99
Advertisement timer: 0.396s, Master router: fe80::13:1:1:1
Virtual router uptime: 00:04:04, Master router uptime: 00:03:58
Virtual MAC: 00:00:5e:00:02:01
Tracking: disabled
Group VRRP PDU statistics
  Advertisement sent           :          186
  Advertisement received       :           0
Group VRRP PDU error statistics
  Bad authentication type received:          0
  Bad password received        :           0
  Bad MD5 digest received      :           0
  Bad advertisement timer received:          0
  Bad VIP count received       :           0
  Bad VIPADDR received        :           0
Group state transition statistics
  Idle to master transitions    :           0
  Idle to backup transitions   :           1
  Backup to master transitions  :           1
  Master to backup transitions :           0

```

show vrrp interface

```

user@host> show vrrp interface
Interface: fe-0/0/0.121, Interface index: 67, Groups: 1, Active : 1
Interface VRRP PDU statistics
  Advertisement sent           :          205
  Advertisement received       :           0
  Packets received             :           0
  No group match received      :           0
Interface VRRP PDU error statistics
  Invalid IPAH next type received:          0
  Invalid VRRP TTL value received:          0
  Invalid VRRP version received :          0
  Invalid VRRP PDU type received:          0
  Invalid VRRP authentication type received: 0
  Invalid VRRP IP count received:          0
  Invalid VRRP checksum received:          0

Physical interface: fe-0/0/0, Unit: 121, Vlan-id: 212, Address: fec0::12:1:1:1/120

Index: 67, SNMP ifIndex: 45, VRRP-Traps: enabled
Interface state: up, Group: 1, State: master
Priority: 200, Advertisement interval: 1, Authentication type: none
Preempt: yes, Accept-data mode: no, VIP count: 2, VIP: fe80::12:1:1:99,
fec0::12:1:1:99
Advertisement timer: 0.789s, Master router: fe80::12:1:1:1
Virtual router uptime: 00:04:26, Master router uptime: 00:04:20
Virtual MAC: 00:00:5e:00:02:01
Tracking: disabled
Group VRRP PDU statistics
  Advertisement sent           :          205
  Advertisement received       :           0
Group VRRP PDU error statistics
  Bad authentication type received:          0
  Bad password received        :           0
  Bad MD5 digest received      :           0
  Bad advertisement timer received:          0
  Bad VIP count received       :           0
  Bad VIPADDR received        :           0
Group state transition statistics
  Idle to master transitions    :           0
  Idle to backup transitions   :           1

```



```
Backup to master transitions : 1
Master to backup transitions : 0
```

show vrrp summary

```
user@host> show vrrp summary
```

| Interface | State | Group | VR state | Type | Address |
|------------|-------|-------|----------|------|-------------|
| ge-4/2/0.0 | up | 1 | backup | lcl | 10.57.0.2 |
| | | | | vip | 10.57.0.100 |

show vrrp track detail

```
user@host> show vrrp track detail
```

```
Tracked interface: ae1.211
State: up, Speed: 400m
Incurred priority cost: 0
Threshold Priority cost Active
400m      10
300m      60
200m     110
100m     160
down      190
Tracking VRRP interface: ae0.210, Group: 1
VR State: master
Current priority: 200, Configured priority: 200
Priority hold-time: disabled, Remaining-time: 50.351
```

show vrrp track summary

```
user@host> show vrrp track summary
```

| Track if | State | Speed | VRRP if | Group | VR State | Current prio |
|----------|-------|-------|---------|-------|----------|--------------|
| ae1.211 | up | 400m | ae0.210 | 1 | master | 200 |

Part 3

Digital Transmission Interfaces

- Digital Transmission Interface Operational Mode Commands on page 241

Chapter 6

Digital Transmission Interface Operational Mode Commands

Table 57 on page 241 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot digital transmission interfaces (T1, E1, T3, and E3). Commands are listed in alphabetical order.

Table 57: Digital Transmission Interface Operational Mode Commands

| Task | Command |
|---|----------------------------|
| Display status information about T1 or E1 interfaces. | show interfaces (T1 or E1) |
| Display status information about T3 or E3 interfaces. | show interfaces (T3 or E3) |



NOTE: Because the output for the E1 and T1 interfaces is almost identical, the command and output are explained once, with notations included for any differences. The same is true for the E3 and T3 interfaces.

show interfaces (T1 or E1)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified T1 or E1 interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the T1 interface type is <i>t1-fpc/pic/port</i>, whereas the E1 interface type is <i>e1-fpc/pic/port</i>. On the J-series routing platform, the T1 interface type is <i>t1-pim/0/port</i>, whereas the E1 interface type is <i>e1-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (T1, PPP) on page 251</p> <p>show interfaces detail (T1, PPP) on page 251</p> <p>show interfaces extensive (T1 CRC Errors) on page 252</p> <p>show interfaces extensive (T1, PPP) on page 253</p> <p>show interfaces (E1, Frame Relay) on page 254</p> <p>show interfaces detail (E1, Frame Relay) on page 255</p> <p>show interfaces extensive (E1, Frame Relay) on page 256</p> |
| Output Fields | Table 58 on page 242 lists the output fields for the show interfaces (T1 or E1) command. Output fields are listed in the approximate order in which they appear. |

Table 58: T1 or E1 show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |

Table 58: T1 or E1 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source: Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Framing | Physical layer framing format used on the link: G704 , G704-NO-CRC4 , or Unframed . The default is G704 . | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval seconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count number—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive none |

Table 58: T1 or E1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|--|-----------------------|
| Keepalive statistics | <p>(PPP and HDLC) Information about keepalive packets. (When no level of output is specified, the word statistics is not part of the field name and the last seen text is not displayed.)</p> <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago).—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago).—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. | detail extensive none |
| LMI settings | <p>(Frame Relay) Settings for Local Management Interface (LMI) can be either ANSI LMI settings or ITU LMI settings. ANSI LMI settings is the default. The format is (ANSI or ITU) LMI settings: value, value... xx seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1–255) ■ n392dce—DCE error threshold (1–10) ■ n392dte—DTE error threshold (1–10) ■ n393dce—DCE monitored event count (1–10) ■ n393dte—DTE monitored event count (1–10) ■ t391dte—DTE polling timer (5–30 seconds) ■ t392dce—DCE polling verification timer (5–30 seconds) | detail extensive none |
| LMI | <p>(Frame Relay) Local Management Interface (LMI) packet statistics:</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: nn (last seen hh:mm:ss ago). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: nn (last sent hh:mm:ss ago). | detail extensive none |
| DTE statistics | <p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data communications equipment (DCE):</p> <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |

Table 58: T1 or E1 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| DCE statistics | (Frame Relay) Statistics about messages transmitted from the DCE to the DTE: <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |
| Common statistics | (Frame Relay) Statistics about messages sent between the DTE and the DCE: <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no Local Management Interface (LMI) packet was reported for n392dte or n393dce intervals. (See LMI settings.) | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay. Displayed only from the DTE.) Number of DLCIs configured from the DCE. | detail extensive none |
| LCP state | (PPP) Link Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | (PPP) Network Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |

Table 58: T1 or E1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Down—CHAP authentication is incomplete (not yet completed or has failed). ■ Not-configured—CHAP is not configured on the interface. ■ Opened—CHAP authentication was successful. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive none |
| CoS Queues | Number of CoS queues configured. | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 58: T1 or E1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------|--|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ SRAM errors—Number of hardware errors that occurred in the static RAM (SRAM) on the PIC or PIM. If the value of this field increments, the PIC or PIM is malfunctioning. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |

Table 58: T1 or E1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------------|
| Queue counters | CoS queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| DS1 alarms | E1 media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain amount of time, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. The following lists all possible alarms and defects. For complete explanations of most of these alarms and defects, see <i>Belcore Telcordia GR-499-CORE</i> . <ul style="list-style-type: none"> ■ AIS—Alarm indication signal. ■ LOF—Loss of frame. ■ LOS—Loss of signal. ■ YLW—Yellow alarm. Indicates errors at the remote site receiver. | detail extensive none |
| DS1 defects | | |
| T1 media or E1 media | Counts of T1 or E1 media-specific errors. <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. The T1 or E1 media-specific error types are: <ul style="list-style-type: none"> ■ SEF—Severely errored framing ■ BEE—Bit error ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ YELLOW—Errors at the remote site receiver ■ CRC Major—Cyclic redundancy check major alarm threshold exceeded ■ CRC Minor—Cyclic redundancy check minor alarm threshold exceeded ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—Pulse code violation ■ CS—Carrier state ■ CRC—Cyclic redundancy check ■ FEBE—Far-end block error (E1 only) ■ LES—Line error seconds ■ ES—Errored seconds ■ BES—Bit error seconds ■ SES—Severely errored seconds ■ SEFS—Severely errored framing seconds ■ UAS—Unavailable seconds | extensive |

Table 58: T1 or E1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| HDLC configuration | <p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> ■ Policing bucket—Configured state of the receiving policer. ■ Shaping bucket—Configured state of the transmitting shaper. ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Timeslots—Time slots configured on the interface. ■ Buildout—(T1 only) Buildout setting: 0-132, 133-265, 266-398, 399-531, or 532-655 feet. ■ Timeslots—Configured time slots for the interface. ■ Byte encoding—(T1 only) Byte encoding used: Nx64K or Nx56K. ■ Line encoding—Line encoding used. For T1, the value can be B8ZS or AMI. For E1, the value is HDB3. ■ Data inversion—HDLC data inversion setting: Enabled or Disabled. ■ Idle cycle flag—Idle cycle flags. ■ Start end flag—Start and end flag. | extensive |
| DS1 BERT configuration | <p>BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface.</p> <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—The queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth</i> %—Percentage of bandwidth allocated to the queue. ■ <i>Bandwidth</i> bps—Bandwidth allocated to the queue (in bps). ■ <i>buffer</i> %—Percentage of buffer space allocated to the queue. ■ <i>Buffer usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ <i>Priority</i>—Queue priority. Possible values are low and high. ■ <i>Limit</i>—Displayed if rate limiting is configured for the queue. Possible values are none and exact. If exact is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |

Table 58: T1 or E1 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | (Frame Relay) Number and rate of bytes and packets received and transmitted on the logical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Local statistics | (Frame Relay) Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | (Frame Relay) Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. This counter normally stabilizes in less than 1 second. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as iso, inet6, mlfrr, or mpls. | detail extensive none |
| Multilink bundle | Interface name for the multilink bundle, if configured. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |

Table 58: T1 or E1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------|--|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive none |
| DLCI | <p>(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags, Total down time, Last down, and Traffic statistics or (Input packets, Output packets). Flags can be one or more of the following:</p> <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when the link is active, but no information is received from the DCE. ■ DCE-Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ DCE-configured—Displayed when the command is issued from the DTE. | detail extensive none |
| DLCI statistics | <p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

**show interfaces
(T1, PPP)**

```

user@host> show interfaces t1-1/1/0
Physical interface: t1-1/1/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 0 (never), Output: 0 (never)
  LCP state: Opened
  NCP state: Opened
  CHAP state: Opened
  CoS queues    : 4 supported, 4 in use
  Last flapped  : 2005-12-05 08:43:06 PST (02:13:35 ago)
  Input rate    : 0 bps (0 pps)
  Output rate   : 72 bps (0 pps)
  DS1 alarms   : None
  DS1 defects  : None

  Logical interface t1-1/1/0.0 (Index 66) (SNMP ifIndex 51)
    Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
    Protocol inet, MTU: 1500
    Flags: Protocol-Down
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255

```

**show interfaces detail
(T1, PPP)**

```

user@host> show interfaces t1-1/1/0 detail
Physical interface: t1-1/1/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45, Generation: 32
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF
  Device flags   : Present Running

```

```

Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags      : Keepalives
Hold-times      : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)
LCP state: Opened
NCP state: Opened
CHAP state: Opened
CoS queues      : 4 supported, 4 in use
Last flapped    : 2005-12-05 08:43:06 PST (02:13:52 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          0          0 bps
  Output bytes :         798          0 bps
  Input packets:          0          0 pps
  Output packets:         42          0 pps
Queue counters:      Queued packets  Transmitted packets  Dropped packets

  0 best-effort          0              0              0

  1 expedited-fo          0              0              0

  2 assured-forw          0              0              0

  3 network-cont         40             40              0

DS1  alarms   : None
DS1  defects  : None
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1
Logical interface t1-1/1/0.0 (Index 66) (SNMP ifIndex 51) (Generation 5)
Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 14, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
Generation: 18

```

**show interfaces
extensive (T1 CRC
Errors)**

```

user@host> show interfaces t1-3/2/0:1:1 extensive
Physical interface: t1-3/2/0:1:1, Enabled, Physical link is Down
Interface index: 179, SNMP ifIndex: 79, Generation: 180
:
:
DS1  alarms   : AIS, LOF, CRC Major, CRC Minor
DS1  defects  : AIS, LOF, CRC Major, CRC Minor
T1 media:      Seconds      Count  State
SEF            1            1  OK
BEE            1            1  OK
AIS           1128            1  Defect Active
LOF           1128            1  Defect Active
LOS            0             0  OK
YELLOW         0             0  OK
CRC Major      154            1  Defect Active
CRC Minor      154            1  Defect Active
BPV            0             0
EXZ            0             0
LCV            0             0
PCV            0             0

```



```

CS                0                0
CRC               154             15400
...

```

**show interfaces
extensive (T1, PPP)**

```

user@host> show interfaces t1-1/1/0 extensive
Physical interface: t1-1/1/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45, Generation: 32
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Hold-times    : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 0 (last seen: never)
    Output: 0 (last sent: never)
  LCP state: Down
  NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Closed
  CoS queues   : 4 supported, 4 in use
  Last flapped : 2005-12-05 08:43:06 PST (02:13:54 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :                0                0 bps
    Output bytes :               817               72 bps
    Input packets:                0                0 pps
    Output packets:              43                0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 0,
    L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
    HS link CRC errors: 0, SRAM errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

    Resource errors: 0
  Queue counters:      Queued packets  Transmitted packets      Dropped packets

    0 best-effort             0                0                0

    1 expedited-fo             0                0                0

    2 assured-forw             0                0                0

    3 network-cont            42                42                0

  DS1  alarms   : None
  DS1  defects  : None
  T1  media:      Seconds      Count  State
    SEF                1         1  OK
    BEE                0         0  OK
    AIS                0         0  OK
    LOF                1         1  OK
    LOS                0         0  OK
    YELLOW             1         1  OK
    BPV                1         1
    EXZ                1         1
    LCV                1       65535
    PCV                1       1023
    CS                 0         0

```

```

LES                      1
ES                       1
SES                      1
SEFS                    1
BES                     0
UAS                     0
HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 1514, Runt threshold: 3
  Timeslots      : All active
  Line encoding: B8ZS
  Buildout       : 0 to 132 feet
  Byte encoding: Nx64K, Data inversion: Disabled, Idle cycle flag: flags,
  Start end flag: shared
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1
Packet Forwarding Engine configuration:
  Destination slot: 1, PLP byte: 1 (0x00)
  CoS transmit queue      Bandwidth      Buffer      Priority      Limit
                        %      bps      %      usec
0 best-effort           95      1459200    95         0        low     none
3 network-control       5       76800     5         0        low     none

Logical interface t1-1/1/0.0 (Index 66) (SNMP ifIndex 51) (Generation 5)
Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 14, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
Generation: 18

```

show interfaces
(E1, Frame Relay)

```

user@host> show interfaces e1-3/0/0
Physical interface: e1-3/0/0, Enabled, Physical link is Up
Interface index: 146, SNMP ifIndex: 37
Link-level type: Frame-Relay, MTU: 1504, Clocking: Internal, Speed: E1,
Loopback: None, FCS: 16, Framing: G704
Device flags      : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps 16384
Link flags       : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 0 (never), Output: 11 (00:00:05 ago)
DTE statistics:
  Enquiries sent           : 10
  Full enquiries sent      : 1
  Enquiry responses received : 0
  Full enquiry responses received : 0
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 1
CoS queues      : 8 supported
Last flapped    : 2005-11-30 14:50:34 PST (4d 20:33 ago)
Input rate      : 0 bps (0 pps)

```

```

Output rate      : 0 bps (0 pps)
DS1  alarms     : None
DS1  defects    : None
Logical interface e1-3/0/0.0 (Index 72) (SNMP ifIndex 32)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
Input packets   : 0
Output packets  : 0
  Protocol inet, MTU: 1500
    Flags: None
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
      Destination: 10.1.3/24, Local: 10.1.3.1, Broadcast: 10.1.3.255
  DLCI 100
    Flags: Down, DCE-Unconfigured
    Total down time: 00:01:13 sec, Last down: 00:01:13 ago
    Input packets : 0
    Output packets: 0
DLCI statistics:
  Active DLCI :0  Inactive DLCI :1

```

**show interfaces detail
(E1, Frame Relay)**

```

user@host> show interfaces e1-3/0/0 detail
Physical interface: e1-3/0/0, Enabled, Physical link is Up
Interface index: 146, SNMP ifIndex: 37, Generation: 69
Link-level type: Frame-Relay, MTU: 1504, Clocking: Internal, Speed: E1,
Loopback: None, FCS: 16, Framing: G704
Device flags   : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps 16384
Link flags     : Keepalives DTE
Hold-times     : Up 0 ms, Down 0 ms
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI statistics:
  Input : 0 (last seen: never)
  Output: 12 (last sent 00:00:02 ago)
DTE statistics:
  Enquiries sent           : 10
  Full enquiries sent      : 2
  Enquiry responses received : 0
  Full enquiry responses received : 0
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 1
CoS queues : 8 supported
Last flapped : 2005-11-30 14:50:34 PST (4d 20:33 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 225 56 bps
Input packets: 0 0 pps
Output packets: 15 0 pps
Queue counters:      Queued packets  Transmitted packets  Dropped packets

0 limited           0              0              0

1 expedited-fo      0              0              0

```

```

2 real-plus          0          0          0
3 network-cont       15         15         0

```

DS1 alarms : None

DS1 defects : None

DS1 BERT configuration:

BERT time period: 10 seconds, Elapsed: 0 seconds

Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)

Logical interface e1-3/0/0.0 (Index 72) (SNMP ifIndex 32) (Generation 26)

Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID

Traffic statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Local statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Transit statistics:

Input bytes : 0 0 bps

Output bytes : 0 0 bps

Input packets: 0 0 pps

Output packets: 0 0 pps

Protocol inet, MTU: 1500, Generation: 32, Route table: 0

Flags: None

Addresses, Flags: Dest-route-down Is-Preferred Is-Primary

Destination: 10.1.3/24, Local: 10.1.3.1, Broadcast: 10.1.3.255,

Generation: 42

DLCI 100

Flags: Down, DCE-Unconfigured

Total down time: 00:01:18 sec, Last down: 00:01:18 ago

Traffic statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

DLCI statistics:

Active DLCI :0 Inactive DLCI :1

show interfaces extensive (E1, Frame Relay)

user@host> show interfaces e1-3/0/0 extensive

Physical interface: e1-3/0/0, Enabled, Physical link is Up

Interface index: 146, SNMP ifIndex: 37, Generation: 69

Link-level type: Frame-Relay, MTU: 1504, Clocking: Internal, Speed: E1,
Loopback: None, FCS: 16, Framing: G704

Device flags : Present Running

Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps 16384

Link flags : Keepalives DTE

Hold-times : Up 0 ms, Down 0 ms

ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds

LMI statistics:

Input : 0 (last seen: never)

Output: 12 (last sent 00:00:05 ago)

DTE statistics:

Enquiries sent : 10

Full enquiries sent : 2

Enquiry responses received : 0

Full enquiry responses received : 0

DCE statistics:

```

Enquiries received           : 0
Full enquiries received      : 0
Enquiry responses sent       : 0
Full enquiry responses sent  : 0
Common statistics:
  Unknown messages received   : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 1
CoS queues      : 8 supported
Last flapped    : 2005-11-30 14:50:34 PST (4d 20:33 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes  :          0          0 bps
  Output bytes :         225          0 bps
  Input packets:          0          0 pps
  Output packets:        15          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 0,
  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
  HS link CRC errors: 0, SRAM errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 17, Errors: 0, Drops: 0, Aged packets: 0,
  MTU errors: 0, Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 limited          0              0              0

  1 expedited-fo     0              0              0

  2 real-plus        0              0              0

  3 network-cont     15             15             0

DS1  alarms   : None
DS1  defects  : None
E1  media:
Seconds      Count  State
SEF          0      0 OK
BEE          5      5 OK
AIS          0      0 OK
LOF         245     15 OK
LOS         245      4 OK
YELLOW       0     11 OK
BPV          0      0
EXZ          9      9
LCV          0      0
PCV          0      0
CS           0      0
FEBE         0      0
LES          0
ES           0
SES          0
SEFS         0
BES          0
UAS         271

HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 1506, Runt threshold: 0
  Timeslots      : All active
  Line encoding:  HDB3, Data inversion: Disabled, Idle cycle flag: flags,

```

```

Start end flag: shared
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 3, PLP byte: 1 (0x00)
  CoS transmit queue      Bandwidth      Buffer  Priority  Limit
                        %      bps      %      usec
0 limited                95      1945600  95        0      low     none
3 network-control        5       102400   5         0      low     none
Logical interface e1-3/0/0.0 (Index 72) (SNMP ifIndex 32) (Generation 26)
Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Transit statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Protocol inet, MTU: 1500, Generation: 32, Route table: 0
  Flags: None
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 10.1.3/24, Local: 10.1.3.1, Broadcast: 10.1.3.255,
    Generation: 42
DLCI 100
  Flags: Down, DCE-Unconfigured
  Total down time: 00:01:21 sec, Last down: 00:01:21 ago
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
DLCI statistics:
  Active DLCI :0 Inactive DLCI :1

```

show interfaces (T3 or E3)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified T3 or E3 interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the T3 interface type is <i>t3-fpc/pic/port</i>, whereas the E3 interface type is <i>e3-fpc/pic/port</i>. On the J-series routing platform, the T3 interface type is <i>t3-pim/0/port</i>, whereas the E3 interface type is <i>e3-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (T3, PPP) on page 269</p> <p>show interfaces detail (T3, PPP) on page 269</p> <p>show interfaces extensive (T3, PPP) on page 270</p> <p>show interfaces (E3, Frame Relay) on page 272</p> <p>show interfaces detail (E3, Frame Relay) on page 273</p> <p>show interfaces extensive (E3, Frame Relay) on page 274</p> |
| Output Fields | Table 59 on page 259 lists the output fields for the show interfaces (T3 or E3) command. Output fields are listed in the approximate order in which they appear. |

Table 59: T3 or E3 show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |

Table 59: T3 or E3 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source. It can be Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Mode | (T3 only) Whether C-bit parity mode or M13 mode is enabled. | All levels |
| Long buildout | (T3 only) Buildout setting: less than 255 feet (68 meters) or greater than 255 feet and shorter than 450 feet (137 meters). | All levels |
| Framing | (E3 only) Physical layer framing format used on the link. It can be G751 or Unframed . The default is G751 . | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval seconds—Time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count number—Number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count number—Number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive none |

Table 59: T3 or E3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------------------|--|-----------------------|
| Keepalive statistics or Keepalive | <p>(PPP and HDLC) Information about keepalive packets.</p> <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. | detail extensive none |
| LMI settings | <p>(Frame Relay) Local Management Interface (LMI) settings (ANSI or ITU). ANSI LMI settings is the default. The format is LMI settings: value, value... xx seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1–255) ■ n392dce—DCE error threshold (1–10) ■ n392dte—DTE error threshold (1–10) ■ n393dce—DCE monitored event count (1–10) ■ n393dte—DTE monitored event count (1–10) ■ t391dte—DTE polling timer (5–30 seconds) ■ t392dce—DCE polling verification timer (5–30 seconds) | detail extensive none |
| LMI | <p>(Frame Relay) LMI statistics:</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: nn (last seen hh:mm:ss ago). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: nn (last sent hh:mm:ss ago). | detail extensive none |
| DTE statistics | <p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data communications equipment (DCE):</p> <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |

Table 59: T3 or E3 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| DCE statistics | <p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |
| Common statistics | <p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no LMI packet was reported for n392dte or n393dce intervals. (See LMI settings.) | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay. Displayed only from the DTE.) Number of DLCIs configured from the DCE. | detail extensive none |
| LCP state | <p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | <p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Opened—NCP negotiation is successful. | detail extensive none |

Table 59: T3 or E3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Resp-received—Response received for the challenge sent, but CHAP not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response sent for the challenge received. ■ Chap-Chal-sent—Challenge sent. ■ Chap-Chal-received—Challenge received but response not yet sent. ■ Down—CHAP authentication is incomplete (not yet completed or has failed). ■ Not-configured—CHAP is not configured on the interface. ■ Opened—CHAP authentication was successful. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone (year-month-day hour:minute:second ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive none |
| CoS queues | Number of CoS queues configured. | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets received on the interface. | detail extensive |

Table 59: T3 or E3 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------|--|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—(T3 only) Number of frames received that are smaller than the runt threshold. ■ Giants—(T3 only) Number of frames received that are larger than the giant threshold. ■ Bucket Drops—Drops resulting from the traffic load exceeding the interface transmit/receive leaky bucket configuration. The default is off. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ SRAM errors—Number of hardware errors that occurred in the static RAM (SRAM) on the PIC or PIM. If the value of this field increments, the PIC or PIM is malfunctioning. ■ Resource errors—Sum of transmit drops. | extensive |

Table 59: T3 or E3 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|----------------|---|-----------------------|
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| Active alarms | E3 media-specific defects that can render the interface unable to pass packets. When a defect persists for a certain amount of time, it is promoted to an alarm. | detail extensive none |
| Active defects | <p>Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface.</p> <ul style="list-style-type: none"> ■ AIS—Alarm indication signal ■ EXZ—Excessive zeros ■ FERF—Far-end receive failures ■ IDLE—Idle code detected ■ LCD—Loss of cell delineation ■ LCV—Line code violation ■ LOF—Loss of frame ■ LOS—Loss of signal ■ PLL—Phase-locked loop ■ YLW—Remote defect indication | |

Table 59: T3 or E3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------|--|-----------------|
| DS3 media or E3 media | <p>Counts of DS3 (T3) or E3 media-specific errors.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>The DS3 or E3 media-specific error types can be:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop out of lock ■ Reframing—Frame alignment recovery time ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ IDLE—Idle code detected ■ YELLOW—Errors at the remote site receiver ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—(DS3 only) Pulse code violation ■ CCV—(DS3 only) C-bit coding violation ■ FEBE—(DS3 only) Far-end block error ■ LES—Line error seconds ■ PES—(DS3 only) P-bit errored seconds ■ PSES—(DS3 only) P-bit errored seconds (section) ■ CES—(DS3 only) C-bit errored seconds ■ CSES—(DS3 only) C-bit severely errored seconds ■ SEFS—Severely errored framing seconds ■ UAS—Unavailable seconds | extensive |
| HDLC configuration | <p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> ■ Policing bucket—Configured state of the receiving policer. ■ Shaping bucket—Configured state of the transmitting shaper. ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Idle cycle flag—Idle cycle flags. ■ Start end flag—Start and end flag. | extensive |

Table 59: T3 or E3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| DSU configuration | <p>Information about the DSU configuration. The last three lines (Bit count, Error bit count, and LOS information) are displayed only if a BERT has ever been run on the interface.</p> <ul style="list-style-type: none"> ■ Compatibility mod—CSU/DSU compatibility mode: None, Larscom, Kentrox, or Digital-Link. ■ Scrambling—Payload scrambling: Enabled or Disabled. ■ Subrate—Configured subrate setting. Applies only when Digital-Link compatibility mode is used. The subrate can be Disabled or display units in Kbps. ■ FEAC loopbac—(T3) Whether a far-end alarm and control (FEAC) loopback is Active or Inactive. This feature is used to send alarm or status information from the far-end terminal back to the near-end terminal and to initiate T3 loopbacks at the far-end terminal from the near-end terminal. ■ Response—Whether the FEAC signal is Enabled or Disabled. ■ Count—Number of FEAC loopbacks. | extensive |
| DS3 (or E3) BERT configuration | <p>BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface.</p> <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—The queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. ■ <i>Bandwidth bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. ■ <i>Buffer usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ <i>Priority</i>—Queue priority: low or high. ■ <i>Limit</i>—Displayed if rate limiting is configured for the queue. Possible values are none and exact. If exact is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | detail extensive none |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |

Table 59: T3 or E3 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | extensive |
| Flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | detail extensive none |
| Encapsulation | Encapsulation on the logical interface. | detail extensive none |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | <p>(Frame Relay) Number and rate of bytes and packets received and transmitted on the logical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Local statistics | (Frame Relay) Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | (Frame Relay) Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. This counter normally stabilizes in less than 1 second. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as iso, inet6, mlfrr, or mpls. | detail extensive none |
| Multilink bundle | (Multilink) Interface name for the multilink bundle. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive none |

Table 59: T3 or E3 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-----------------|--|-----------------------|
| DLCI | <p>(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags, Total down time, Last down, and Traffic statistics (or Input packets, Output packets). Flags is one or more of the following:</p> <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when the link is active, but no information is received from the DCE. ■ DCE Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ DCE-configured—Displayed when the command is issued from the DTE. | detail extensive none |
| DLCI statistics | <p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

```

show interfaces      user@host> show interfaces t3-0/2/0
(T3, PPP)           Physical interface: t3-0/2/0, Enabled, Physical link is Up
                        Interface index: 139, SNMP ifIndex: 35
                        Link-level type: PPP, MTU: 4474, Clocking: Internal, Speed: T3,
                        Loopback: None, FCS: 16, Mode: C/Bit parity,
                        Long buildout: Shorter than 255 feet
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                        Link flags     : Keepalives
                        Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
                        Keepalive: Input: 0 (never), Output: 0 (never)
                        LCP state: Down
                        NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
                        mpls: Not-configured
                        CHAP state: Closed
                        CoS queues    : 4 supported, 4 in use
                        Last flapped  : 2005-12-05 08:43:06 PST (02:18:40 ago)
                        Input rate    : 0 bps (0 pps)
                        Output rate   : 72 bps (0 pps)
                        Active alarms : None
                        Active defects: None
                        DS3 BERT configuration:
                        BERT time period: 10 seconds, Elapsed: 0 seconds
                        Algorithm: 2^15 - 1, 0.151, Pseudorandom (9), Induced error rate: 10e-0

                        Logical interface t3-0/2/0.0 (Index 66) (SNMP ifIndex 54)
                        Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
                        Protocol inet, MTU: 4470
                        Flags: Protocol-Down
                        Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
                        Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255

```

```

show interfaces detail user@host> show interfaces t3-0/2/0 detail
(T3, PPP)           Physical interface: t3-0/2/0, Enabled, Physical link is Up
                        Interface index: 139, SNMP ifIndex: 35, Generation: 22

```

```

Link-level type: PPP, MTU: 4474, Clocking: Internal, Speed: T3,
Loopback: None, FCS: 16, Mode: C/Bit parity,
Long buildout: Shorter than 255 feet
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)
LCP state: Down
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
CoS queues   : 4 supported, 4 in use
Last flapped : 2005-12-05 08:43:06 PST (02:18:45 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :           0          0 bps
  Output bytes :          152          0 bps
  Input packets:           0          0 pps
  Output packets:          8          0 pps
Queue counters:      Queued packets  Transmitted packets  Dropped packets

  0 best-effort           0              0              0
  1 expedited-fo         0              0              0
  2 assured-forw         0              0              0
  3 network-cont         6              6              0

Active alarms : None
Active defects : None
DS3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^15 - 1, 0.151, Pseudorandom (9), Induced error rate: 10e-0

Logical interface t3-0/2/0.0 (Index 66) (SNMP ifIndex 54) (Generation 8)
  Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 4470, Generation: 17, Route table: 0
  Flags: Protocol-Down
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
    Generation: 24

```

**show interfaces
extensive (T3, PPP)**

```

user@host> show interfaces t3-0/2/0 extensive
Physical interface: t3-0/2/0, Enabled, Physical link is Up
Interface index: 139, SNMP ifIndex: 35, Generation: 22
Link-level type: PPP, MTU: 4474, Clocking: Internal, Speed: T3,
Loopback: None, FCS: 16, Mode: C/Bit parity,
Long buildout: Shorter than 255 feet
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)

```

```

LCP state: Down
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
CoS queues      : 4 supported, 4 in use
Last flapped    : 2005-12-05 08:43:06 PST (02:18:47 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes  :                0                0 bps
Output bytes :               171               72 bps
Input packets:                0                0 pps
Output packets:               9                0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
Bucket drops: 0, Policed discards: 0, L3 incompletes: 0,
L2 channel errors: 0, L2 mismatch timeouts: 0, HS link CRC errors: 0,
SRAM errors: 0, Resource errors: 0
Output errors:
Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort                0                0                0
1 expedited-fo              0                0                0
2 assured-forw              0                0                0
3 network-cont              7                7                0

Active alarms  : None
Active defects : None
DS3 media:      Seconds      Count  State
PLL Lock        0          0  OK
Reframing       0          0  OK
AIS             0          0  OK
LOF             0          0  OK
LOS             0          0  OK
IDLE            0          0  OK
YELLOW          0          0  OK
BPV             0          0
EXZ             0          0
LCV             1          4
PCV             0          0
CCV             0          0
FEBE            1         11
LES             1
PES             0
PSES            0
CES             0
CES             0
SEFS            0
UAS             0

HDLC configuration:
Policing bucket: Disabled
Shaping bucket : Disabled
Giant threshold: 4484, Runt threshold: 3
Idle cycle flag: flags, Start end flag: shared
DSU configuration:
Compatibility mode: None, Scrambling: Disabled, Subrate: Disabled

```

```

FEAC loopback: Inactive, Response: Disabled, Count: 0
DS3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^15 - 1, 0.151, Pseudorandom (9), Induced error rate: 10e-0
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 1 (0x00)
  CoS transmit queue      Bandwidth      Buffer   Priority   Limit
                        %          bps      %        usec
  0 best-effort           95      42499200  95         0        low   none
  3 network-control       5       2236800   5         0        low   none

Logical interface t3-0/2/0.0 (Index 66) (SNMP ifIndex 54) (Generation 8)
  Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 4470, Generation: 17, Route table: 0
  Flags: Protocol-Down
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
    Generation: 24

```

show interfaces
(E3, Frame Relay)

```

user@host> show interfaces e3-1/2/0
Physical interface: e3-1/2/0, Enabled, Physical link is Up
  Interface index: 153, SNMP ifIndex: 49
  Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, Speed: E3,
  Loopback: None, FCS: 16, Framing: G751
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives DTE
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI: Input: 0 (never), Output: 4 (00:00:06 ago)
  DTE statistics:
    Enquiries sent           : 4
    Full enquiries sent      : 0
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received  : 0
    Enquiry responses sent   : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 1
  CoS queues   : 4 supported, 4 in use
  Last flapped : 2005-12-05 08:46:14 PST (02:27:17 ago)
  Input rate   : 0 bps (0 pps)
  Output rate  : 0 bps (0 pps)
  Active alarms : None
  Active defects : None

Logical interface e3-1/2/0.0 (Index 66) (SNMP ifIndex 57)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 4470
  Flags: None
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255
  DLCI 100
  Flags: Down, DCE-Unconfigured

```

```

Total down time: 00:00:06 sec, Last down: 00:00:06 ago
Input packets : 0
Output packets: 0
DLCI statistics:
Active DLCI :0 Inactive DLCI :1

```

**show interfaces detail
(E3, Frame Relay)**

```

user@host> show interfaces e3-1/2/0 detail
Physical interface: e3-1/2/0, Enabled, Physical link is Up
Interface index: 153, SNMP ifIndex: 49, Generation: 36
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, Speed: E3,
Loopback: None, FCS: 16, Framing: G751
Device flags : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
Link flags : Keepalives DTE
Hold-times : Up 0 ms, Down 0 ms
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI statistics:
Input : 0 (last seen: never)
Output: 5 (last sent 00:00:07 ago)
DTE statistics:
Enquiries sent : 5
Full enquiries sent : 0
Enquiry responses received : 0
Full enquiry responses received : 0
DCE statistics:
Enquiries received : 0
Full enquiries received : 0
Enquiry responses sent : 0
Full enquiry responses sent : 0
Common statistics:
Unknown messages received : 0
Asynchronous updates received : 0
Out-of-sequence packets received : 0
Keepalive responses timedout : 1
CoS queues : 4 supported, 4 in use
Last flapped : 2005-12-05 08:46:14 PST (02:27:27 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 806 0 bps
Input packets: 0 0 pps
Output packets: 44 0 pps
Queue counters: Queued packets Transmitted packets Dropped packets

0 best-effort 0 0 0
1 expedited-fo 0 0 0
2 assured-forw 0 0 0
3 network-cont 43 43 0

Active alarms : None
Active defects : None

Logical interface e3-1/2/0.0 (Index 66) (SNMP ifIndex 57) (Generation 15)
Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0

```

```

Output packets:                0
Local statistics:
Input bytes :                  0
Output bytes :                 0
Input packets:                 0
Output packets:                0
Transit statistics:
Input bytes :                  0          0 bps
Output bytes :                 0          0 bps
Input packets:                 0          0 pps
Output packets:                0          0 pps
Protocol inet, MTU: 4470, Generation: 24, Route table: 0
Flags: None
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
Generation: 38
DLCI 100
Flags: Down, DCE-Unconfigured
Total down time: 00:00:16 sec, Last down: 00:00:16 ago
Traffic statistics:
Input bytes :                  0
Output bytes :                 0
Input packets:                 0
Output packets:                0
DLCI statistics:
Active DLCI :0 Inactive DLCI :1

```

**show interfaces
extensive
(E3, Frame Relay)**

```

user@host> show interfaces e3-1/2/0 extensive
Physical interface: e3-1/2/0, Enabled, Physical link is Up
Interface index: 153, SNMP ifIndex: 49, Generation: 36
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, Speed: E3,
Loopback: None, FCS: 16, Framing: G751
Device flags : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
Link flags : Keepalives DTE
Hold-times : Up 0 ms, Down 0 ms
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI statistics:
Input : 0 (last seen: never)
Output: 6 (last sent 00:00:02 ago)
DTE statistics:
Enquiries sent : 5
Full enquiries sent : 1
Enquiry responses received : 0
Full enquiry responses received : 0
DCE statistics:
Enquiries received : 0
Full enquiries received : 0
Enquiry responses sent : 0
Full enquiry responses sent : 0
Common statistics:
Unknown messages received : 0
Asynchronous updates received : 0
Out-of-sequence packets received : 0
Keepalive responses timeout : 1
CoS queues : 4 supported, 4 in use
Last flapped : 2005-12-05 08:46:14 PST (02:27:30 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 821 56 bps

```

```

Input packets:          0          0 pps
Output packets:         45          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 21118, Bucket drops: 0,
  Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0,
  L2 mismatch timeouts: 0, HS link CRC errors: 0, SRAM errors: 0,
  Resource errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
  Resource errors: 0
Queue counters:
  Queued packets  Transmitted packets  Dropped packets

  0 best-effort      0              0              0
  1 expedited-fo     0              0              0
  2 assured-forw     0              0              0
  3 network-cont     44             44             0

Active alarms : None
Active defects : None
E3 media:
  Seconds      Count  State
  PLL Lock      0        0 OK
  Reframing     187        1 OK
  AIS            0        0 OK
  LOF           187        1 OK
  LOS           187        1 OK
  IDLE          0         0 OK
  YELLOW        0         0 OK
  BPV           0         0
  EXZ           0         0
  LCV           188    12303167
  LES           188
  SEFS          187
  UAS           195
DSU configuration:
  Compatibility mode: None, Scrambling: Disabled
E3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^15 - 1, 0.151, Pseudorandom (9), Induced Error rate: 10e-0
Packet Forwarding Engine configuration:
  Destination slot: 1, PLP byte: 1 (0x00)
  CoS transmit queue  Bandwidth      Buffer  Priority  Limit
                     %      bps      %      usec
  0 best-effort      95    32649600  95      0      low  none
  3 network-control  5     1718400   5       0      low  none

Logical interface e3-1/2/0.0 (Index 66) (SNMP ifIndex 57) (Generation 15)
Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:         0
  Output packets:        0
Local statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:         0
  Output packets:        0

```

```
Transit statistics:
  Input bytes :                0                0 bps
  Output bytes :                0                0 bps
  Input packets:                0                0 pps
  Output packets:              0                0 pps
Protocol inet, MTU: 4470, Generation: 24, Route table: 0
  Flags: None
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
    Generation: 38
DLCI 100
  Flags: Down, DCE-Unconfigured
  Total down time: 00:00:19 sec, Last down: 00:00:19 ago
  Traffic statistics:
    Input bytes :                0
    Output bytes :                0
    Input packets:                0
    Output packets:              0
DLCI statistics:
  Active DLCI :0 Inactive DLCI :1
```


Part 4

IP Demux Interfaces

- IP Demux Interface Operational Mode Commands on page 279

Chapter 7

IP Demux Interface Operational Mode Commands

Table 60 on page 279 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot IP demultiplexing (demux) interfaces. Commands are listed in alphabetical order.

Table 60: IP Demux Interfaces Operational Mode Commands

| Task | Command |
|---|---|
| Display IP demux interface information. | show interfaces demux0 (Demux Interfaces) |

show interfaces demux0 (Demux Interfaces)

| | |
|---------------------------------|--|
| Syntax | show interfaces demux0 <i>logical-interface-number</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced in JUNOS Release 9.0. |
| Description | (MX-series and M-series routing platforms only) Display status information about the specified demux interface. |
| Options | <p>none—Display standard information about the specified demux interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (demux) on page 285 |
| Output Fields | Table 33 on page 154 lists the output fields for the show interfaces (demux interfaces) command. Output fields are listed in the approximate order in which they appear. |

Table 61: Demux show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|--------------------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | brief detail extensive none |
| Interface index | Index number of the physical interface, which reflects its initialization sequence. | brief detail extensive none |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | brief detail extensive none |
| Physical link | Status of the physical link (Up or Down). | detail extensive none |
| Admin | Administrative state of the interface (Up or Down). | terse |
| Interface index | Index number of the physical interface, which reflects its initialization sequence. | detail extensive none |

Table 61: Demux show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------------|
| Link | Status of the physical link (Up or Down). | terse |
| Proto | Protocol family configured on the interface. | terse |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. Software-Pseudo indicates a standard software interface with no associated hardware device. | brief detail extensive none |
| Link-level type | Encapsulation being used on the physical interface. | brief detail extensive |
| MTU | Maximum transmission unit size on the physical interface. | brief detail extensive |
| Clocking | Reference clock source: Internal (1) or External (2). | brief detail extensive |
| Speed | Speed at which the interface is running. | brief detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | brief detail extensive none |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | brief detail extensive none |
| Link type | Data transmission type. | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive none |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | Hardware MAC address. | detail extensive |
| Alternate link address | Backup address of the link. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second:timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |

Table 61: Demux show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|--|------------------|
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. ■ IPv6 transit statistics—Number of IPv6 transit bytes and packets received and transmitted on the physical interface if IPv6 statistics tracking is enabled. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runt—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant packet threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | extensive |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | none |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |

Table 61: Demux show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|--------------------------------|
| Output Rate | Output rate in bps and pps. | none |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | brief detail extensive none |
| Index | Index number of the logical interface, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP interface index number for the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | brief detail extensive none |
| Encapsulation | Encapsulation on the logical interface. | brief extensive none |
| Demux | Specific IP demultiplexing (demux) values: <ul style="list-style-type: none"> ■ Underlying interface—The underlying interface that the demux interface uses. ■ Index—Index number of the logical interface. ■ Family—Protocol family configured on the logical interface. ■ Source prefixes, total—Total number of source prefixes for the underlying interface. ■ Destination prefixes, total—Total number of destination prefixes for the underlying interface. ■ Prefix—Family Inet prefix. | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. | brief |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the specified interface set. <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface set. ■ Input packets, Output packets—Number of packets received and transmitted on the interface set. ■ IPv6 transit statistics—Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 61: Demux show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|----------------------------------|
| Local statistics | Number of transit bytes and packets received and transmitted on the local interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Transit statistics | Number and rate of bytes and packets transiting the switch. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| IPv6 Transit statistics | Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input packets | Number of packets received on the interface. | none |
| Output packets | Number of packets transmitted on the interface. | none |
| Protocol | Protocol family. Possible values are described in “Protocol Field” on page 92. | detail extensive none |
| MTU | Maximum transmission unit size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Route table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Mac-Validate Failures | Number of MAC address validation failures for packets and bytes. This field is displayed when MAC address validation is enabled for the logical interface. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive statistics none |
| Local | IP address of the logical interface. | detail extensive terse none |
| Remote | IP address of the remote interface. | terse |

Table 61: Demux show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|---|-----------------------|
| Broadcast | Broadcast address of the logical interlace. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces demux0
extensive (demux)  Physical interface: demux0, Enabled, Physical link is Up
                    Interface index: 128, SNMP ifIndex: 79, Generation: 129
                    Type: Software-Pseudo, Link-level type: Unspecified, MTU: 9192, Clocking: 1,
                    Speed: Unspecified
                    Device flags   : Present Running
                    Interface flags: Point-To-Point SNMP-Traps
                    Link type      : Full-Duplex
                    Link flags     : None
                    Physical info  : Unspecified
                    Hold-times     : Up 0 ms, Down 0 ms
                    Current address: Unspecified, Hardware address: Unspecified
                    Alternate link address: Unspecified
                    Last flapped   : Never
                    Statistics last cleared: Never
                    Traffic statistics:
                    Input bytes   :           0           0 bps
                    Output bytes  :           0           0 bps
                    Input packets :           0           0 pps
                    Output packets:           0           0 pps
                    IPv6 transit statistics:
                    Input bytes   :           0
                    Output bytes  :           0
                    Input packets :           0
                    Output packets:           0
                    Input errors:
                    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
                    Policed discards: 0, Resource errors: 0
                    Output errors:
                    Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
                    Resource errors: 0

                    Logical interface demux0.0 (Index 87) (SNMP ifIndex 84) (Generation 312)
                    Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
                    Demux:
                    Underlying interface: ge-2/0/1.0 (Index 74)
                    Family Inet Source prefixes, total 1
                    Prefix: 1.1.1/24
                    Traffic statistics:
                    Input bytes   :           0
                    Output bytes  :          1554
                    Input packets :           0
                    Output packets:           37
                    IPv6 transit statistics:
                    Input bytes   :           0
                    Output bytes  :           0
                    Input packets :           0
                    Output packets:           0
                    Local statistics:
                    Input bytes   :           0

```

```
Output bytes :          1554
Input  packets:          0
Output packets:         37
Transit statistics:
Input  bytes :          0          0 bps
Output bytes :          0          0 bps
Input  packets:         0          0 pps
Output packets:         0          0 pps
IPv6 transit statistics:
Input  bytes :          0
Output bytes :          0
Input  packets:         0
Output packets:         0
Protocol inet, MTU: 1500, Generation: 395, Route table: 0
Flags: Is-Primary, Mac-Validate-Strict
Mac-Validate Failures: Packets: 0, Bytes: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 11.1.1/24, Local: 11.1.1.1, Broadcast: 11.1.1.255,
Generation: 434
```

Part 5

PPP and PPPoE Interfaces

- PPP Interface Operational Mode Commands on page 289
- PPPoE Interface Operational Mode Commands on page 305

Chapter 8

PPP Interface Operational Mode Commands

Table 62 on page 289 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Point-to-Point Protocol (PPP) interfaces. Commands are listed in alphabetical order.

Table 62: PPP Interfaces Operational Mode Commands

| Task | Command |
|--|-----------------------|
| Clear PPP statistics. | clear ppp statistics |
| Display PPP address pool information. | show ppp address-pool |
| Display PPP session information for an interface. | show ppp interface |
| Display PPP session statistics. | show ppp statistics |
| Display summary information about PPP-configured interfaces. | show ppp summary |

clear ppp statistics

| | |
|---------------------------------|--|
| Syntax | clear ppp statistics <interface <i>interface-name</i> > |
| Release Information | Command introduced in JUNOS Release 7.6. |
| Description | Reset PPP session statistics information. |
| Options | none—Reset PPP statistics for all interfaces. interface <i>interface-name</i> —(Optional) Reset PPP statistics for the specified interface. |
| Required Privilege Level | clear |
| Related Topics | show pppoe statistics |
| List of Sample Output | clear ppp statistics on page 290 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear ppp statistics | user@host> clear ppp statistics |

show ppp address-pool

| | |
|---------------------------------|---|
| Syntax | show ppp address-pool <i>pool-name</i> <detail> |
| Release Information | Command introduced in JUNOS Release 7.5. |
| Description | Display PPP address pool information. |
| Options | <i>pool-name</i> —Address pool name. detail—(Optional) Display detailed address pool information. |
| Required Privilege Level | view |
| List of Sample Output | show ppp address-pool on page 292 show ppp address-pool detail on page 292 |
| Output Fields | Table 63 on page 291 lists the output fields for the show ppp address-pool command. Output fields are listed in the approximate order in which they appear. |

Table 63: show ppp address-pool Output Fields

| Field Name | Field Description | Level of Output |
|--------------------------------|--|-----------------|
| Address pool | Trace address pool code. | All levels |
| Address range | Range of sequentially ordered IP addresses contained in the address pool. | detail |
| Number of assigned addresses | Fixed IP address that is to be given to remote users when they dial in. This is a host-only IP address (subnet mask is 255.255.255.255) and is only for single connection receiver profiles. | All levels |
| Number of addresses configured | Number of IP addresses that are available for allocation and used by PPP sessions. | All levels |
| Assigned addresses | Addresses assigned to PPP sessions from the address pool. | detail |

```
show ppp address-pool user@host> show ppp address-pool
Address pool ppp1
  Address range: 10.10.220.1 - 10.10.220.10
  Number of assigned addresses: 0
  Number of addresses configured: 10

show ppp address-pool user@host> show ppp address-pool ppp1 detail
detail Address pool ppp1
  Address range: 10.10.220.1 - 10.10.220.10
  Number of assigned addresses: 2
  Number of addresses configured: 10
  Assigned addresses:
    10.10.220.1
    10.10.220.2
```


show ppp interface

| | |
|---------------------------------|--|
| Syntax | show ppp interface <i>interface-name</i> <extensive terse> |
| Release Information | Command introduced in JUNOS Release 7.5. |
| Description | Display information about PPP interfaces. |
| Options | <i>interface-name</i> —Name of a logical interface. extensive terse—(Optional) Display the specified level of output. |
| Required Privilege Level | view |
| List of Sample Output | show ppp interface on page 297 show ppp interface extensive on page 297 show ppp interface terse on page 298 |
| Output Fields | Table 64 on page 293 lists the output fields for the show ppp interface command. Output fields are listed in the approximate order in which they appear. |

Table 64: show ppp interface Output Fields

| Field Name | Field Description | Level of Output |
|-----------------------|---|-----------------|
| Session | Name of the logical interface on which the session is running. | All levels |
| Type | Session type: PPP. | All levels |
| Phase | PPP process phase: Authenticate, Pending, Establish, LCP, Network, and Disabled. | All levels |
| Session flags | Special conditions present in the session: Bundled, TCC, No-keepalives, Looped, Monitored, and NCP-only. | All levels |
| <i>protocol</i> State | Protocol state information. See specific protocol state fields for information. | None specified |
| AUTHENTICATION | Challenge-Handshake Authentication Protocol (CHAP) authentication state information or Password Authentication Protocol (PAP) state information. See the Authentication field description for further information. | None specified |

Table 64: show ppp interface Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|--|-----------------|
| LCP | <p>LCP information:</p> <ul style="list-style-type: none"> ■ State—LCP protocol state: <ul style="list-style-type: none"> ■ Ack-rcvd—A Configure-Request has been sent and a Configure-Ack has been received. ■ Ack-sent—A Configure-Request and a Configure-Ack have both been sent, but a Configure-Ack has not yet been received. ■ Closed—Link is not available for traffic. ■ Opened—Link is administratively available for traffic. ■ Req-sent—An attempt has been made to configure the connection. ■ Last started—LCP state start time. ■ Last completed—LCP state completion time. ■ Negotiated options: <ul style="list-style-type: none"> ■ ACFC—Address and-Control Field Compression. A configuration option that provides a method to negotiate the compression of the Data Link Layer Address and Control fields. ■ Asynchronous map—Asynchronous control character map. A configuration option used on asynchronous links such as telephone lines to identify control characters that must be replaced by a two-character sequence to prevent them from being interpreted by equipment used to establish the link. ■ Authentication protocol—Protocol used for authentication. This option provides a method to negotiate the use of a specific protocol for authentication. It requires a peer to authenticate itself before allowing network-layer protocol packets to be exchanged. By default, authentication is not required. ■ Authentication algorithm—Type of authentication algorithm. The Message Digest algorithm (MD5) is the only algorithm supported. ■ Endpoint discriminator class—For multilink PPP (MLPPP), a configuration option that identifies the system transmitting the packet. This option advises a system that the peer on this link could be the same as the peer on another existing link. ■ Magic number—A configuration option that provides a method to detect looped-back links and other data-link layer anomalies. By default, the magic number is not negotiated. ■ MRU—Maximum receive unit. A configuration option that may be sent to inform the peer that the implementation can receive larger packets, or to request that the peer send smaller packets. The default value is 1500 octets. ■ MRRU—For multilink PPP, the maximum receive reconstructed unit. A configuration option that specifies the maximum number of octets in the Information fields of reassembled packets. ■ Multilink header suspendable classes—For MLPPP, an LCP option that advises the peer that the implementation wishes to receive fragments with a format given by the code number, with the maximum number of suspendable classes given. ■ Multilink header format classes—For MLPPP, an LCP option that advises the peer that the implementation wishes to receive fragments with a format given by the code number. ■ PFC—Protocol-Field-Compression. A configuration option that provides a method to negotiate the compression of the PPP Protocol field. ■ short sequence—For MLPPP, an option that advises the peer that the implementation wishes to receive fragments with short, 12-bit sequence numbers. | extensive |

Table 64: show ppp interface Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------|--|-----------------|
| Authentication | <p>CHAP or PAP authentication state information. For CHAP authentication:</p> <ul style="list-style-type: none"> ■ Chap-ans-rcvd—Packet was sent from the peer, indicating that the peer received the Chap-resp-sent packet. ■ Chap-ans-sent—Packet was sent from the authenticator, indicating that the authenticator received the peer's Chap-resp-rcvd packet. ■ Chap-chal-rcvd—Challenge packet has been received by the peer. ■ Chap-chal-sent—Challenge packet has been sent by the authenticator to begin the CHAP protocol or has been transmitted at any time during the Network-Layer Protocol (NCP) phase to ensure that the connection has not been altered. ■ Chap-resp-rcvd—CHAP response packet has been received by the authenticator. ■ Chap-resp-sent—CHAP response packet has been sent to the authenticator. ■ Closed—Link is not available for authentication. ■ Failure—Authenticator compares the response value in the response packet from the peer with its own response value, but the value does not match. Authentication fails. ■ Success—Authenticator compares the response value in the response packet from the peer with its own response value, and the value matches. Authentication is successful. <p>For PAP authentication:</p> <ul style="list-style-type: none"> ■ Pap-resp-sent—PAP response sent to peer (ACK/NACK). ■ Pap-req-rcvd—PAP request packet received from peer. ■ Pap-resp-rcvd—PAP response received from the peer (ACK/NACK). ■ Pap-req-sent—PAP request packet sent to the peer. ■ Closed—Link is not available for authentication. ■ Failure—Authenticator compares the response value in the response packet from the peer with its own response value, but the value does not match. Authentication fails. ■ Success—Authenticator compares the response value in the response packet from the peer with its own response value, and the value matches. Authentication is successful. | None specified |

Table 64: show ppp interface Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|--|-----------------|
| IPCP | <p>Internet Protocol Control Protocol (IPCP) information.</p> <ul style="list-style-type: none"> ■ State—One of the following values: <ul style="list-style-type: none"> ■ Ack-rcvd—A Configure-Request has been sent and a Configure-Ack has been received. ■ Ack-sent—A Configure-Request and a Configure-Ack have both been sent, but a Configure-Ack has not yet been received. ■ Closed—Link is not available for traffic. ■ Opened—Link is administratively available for traffic. ■ Req-sent—An attempt has been made to configure the connection. ■ Last started—IPCP state start time. ■ Last completed—IPCP state authentication completion time. ■ Negotiated options: <ul style="list-style-type: none"> ■ compression protocol—Negotiate the use of a specific compression protocol. By default, compression is not enabled. ■ local address—Desired local address of the sender of a Configure-Request. If all four octets are set to zero, the peer provides the IP address. ■ primary DNS server—Negotiate with the remote peer to select the address of the primary DNS server to be used on the local end of the link. ■ primary WINS server—Negotiate with the remote peer to select the address of the primary WINS server to be used on the local end of the link. ■ remote address—IP address of the remote end of the link in dotted quad notation. ■ secondary DNS server—Negotiate with the remote peer to select the address of the secondary DNS server to be used on the local end of the link. ■ secondary WINS server—Negotiate with the remote peer to select the address of the secondary WINS server to be used on the local end of the link. | extensive |
| IPV6CP | <p>Internet Protocol version 6 Control Protocol (IPV6CP) information.</p> <ul style="list-style-type: none"> ■ State—One of the following values: <ul style="list-style-type: none"> ■ Ack-rcvd—A Configure-Request has been sent and a Configure-Ack has been received. ■ Ack-sent—A Configure-Request and a Configure-Ack have both been sent, but a Configure-Ack has not yet been received. ■ Closed—Link is not available for traffic. ■ Opened—Link is administratively available for traffic. ■ Req-sent—An attempt has been made to configure the connection. ■ Last started—IPV6CP state start time. ■ Last completed—IPV6CP state authentication completion time. ■ Negotiated options : <ul style="list-style-type: none"> ■ local interface identifier—Desired local address of the sender of a Configure-Request. If all four octets are set to zero, the peer provides the IP address. ■ remote interface identifier—IP address of the remote end of the link in dotted quad notation. | extensive |

Table 64: show ppp interface Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------|--|-------------------|
| OSINLCP State | <p>OSI Network Layer Control Protocol (OSINLCP) protocol state information:</p> <ul style="list-style-type: none"> ■ State: <ul style="list-style-type: none"> ■ Ack-rcvd—Configure-Request has been sent and Configure-Ack has been received. ■ Ack-sent—Configure-Request and Configure-Ack have both been sent, but Configure-Ack has not yet been received. ■ Closed—Link is not available for traffic. ■ Opened—Link is administratively available for traffic. ■ Req-sent—Attempt has been made to configure the connection. ■ Last started—OSINLCP state start time. ■ Last completed—OSINLCP state completion time. | extensive |
| TAGCP | <p>TAGCP information.</p> <ul style="list-style-type: none"> ■ State—One of the following values: <ul style="list-style-type: none"> ■ Ack-rcvd—A Configure-Request has been sent and a Configure-Ack has been received. ■ Ack-sent—A Configure-Request and a Configure-Ack have both been sent, but a Configure-Ack has not yet been received. ■ Closed—Link is not available for traffic. ■ Opened—Link is administratively available for traffic. ■ Req-sent—An attempt has been made to configure the connection. ■ Last started—TAGCP state start time. ■ Last completed—TAGCP state authentication completion time. | extensive none |

```

show ppp interface user@host> show ppp interface so-1/3/0.0
Session so-1/3/0.0, Type: PPP, Phase: Authenticate
Session flags: Monitored
LCP State: Opened
AUTHENTICATION: CHAP State: Chap-resp-sent, Chap-ans-sent
IPCP State: Closed, OSINLCP State: Closed

show ppp interface user@host> show ppp interface so-0/0/3.0 extensive
extensive Session so-0/0/3.0, Type: PPP, Phase: Network
LCP
State: Opened
Last started: 2007-01-29 10:43:50 PST
Last completed: 2007-01-29 10:43:50 PST
Negotiated options:
Authentication protocol: PAP, Magic number: 2341124815, MRU: 4470
Authentication: PAP
State: Success
Last started: 2007-01-29 10:43:50 PST
Last completed: 2007-01-29 10:43:50 PST
IPCP
State: Opened
Last started: 2007-01-29 10:43:50 PST
Last completed: 2007-01-29 10:43:50 PST
Negotiated options:
Local address: 10.10.10.1, Remote address: 10.10.10.2

```

```
show ppp interface terse  user@host> show ppp interface so-1/3/0 terse  
Session name      Session type  Session phase  Session flags  
so-1/3/0.0        PPP          Authenticate   Monitored
```

show ppp statistics

| | |
|---------------------------------|---|
| Syntax | show ppp statistics <detail> <memory> |
| Release Information | Command introduced in JUNOS Release 7.5. |
| Description | Display PPP interface statistics information. |
| Options | detail—(Optional) Display the detailed statistics. memory—(Optional) Display PPP process memory statistics. |
| Required Privilege Level | view |
| List of Sample Output | show ppp statistics detail on page 302 |
| Output Fields | Table 65 on page 299 lists the output fields for the show ppp statistics command. Output fields are listed in the approximate order in which they appear. |

Table 65: show ppp statistics Output Fields

| Field Name | Field Description | Level of Output |
|--------------------------------|---|-----------------|
| Total sessions | Number of PPP sessions on an interface. | none detail |
| Sessions in disabled phase | Number of PPP sessions disabled. Number of sessions where the link is either administratively or physically down. Once the PPP process learns from the kernel that Layer 2 is ready to send and receive traffic, it will do a phase transition from disabled to established. When LCP and NCP transitions through states, links transition to the establish phase when terminate packets are exchanged or some other failure, such as authentication or expiration of a timer occurs. | none detail |
| Sessions in establish phase | Number of PPP sessions in establish phase. In order to establish communications over a point-to-point link, each end of the PPP link must first send LCP packets to configure and test the data link. | none detail |
| Sessions in authenticate phase | Number of PPP sessions in authenticate phase. Each end of the PPP link must first send LCP packets to configure the data link during the link establishment phase. After the link has been established, PPP provides for an optional authentication phase before proceeding to the Network-Layer Protocol (NLP) phase. | none detail |
| Sessions in network phase | Number of PPP sessions in the network phase. After a link has been established and optional facilities have been negotiated as needed by the LCP, PPP must send Network Control Protocol (NCP) packets to choose and configure one or more network-layer protocols, such as IP, IPX, or AppleTalk. Once each of the chosen network-layer protocols has been configured, datagrams from each network-layer protocol can be sent over the link. | none detail |
| Bundles in pending phase | Number of unique bundles to which PPP links are referring. | none detail |

Table 65: show ppp statistics Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|--|-----------------|
| Type | Type of structure for which memory is allocated. | detail |
| | <ul style="list-style-type: none"> ■ Queued rtsock msgs—Queued route socket messages. When a PPP process is unable to send a route socket message to the kernel (typically because of congestion of the route socket interface), the message is queued for deferred processing. ■ PPP session—Active PPP session. Stores all the information for a PPP session, such as authentication, sequence number, LCP session, and NCP session information. ■ Interface address—Interface address associated with a PPP connection. Stores the information about the interface address that PPP obtains from the kernel. ■ Destination profile—Stores the destination profile information associated with an interface address. ■ ML link settings—Stores information about an MLPPP link, such as the bundle name and compressed real-time transport protocol (CRTP) settings. ■ IPCP blocked address—When addresses are blocked in an address pool (for example, when the interface address is within the range of an address pool, it will be implicitly blocked), this structure is used to store the address in the pool. ■ PPP session trace—A PPP session trace is allocated for record keeping for each session listed at the [set protocols ppp monitor-session] hierarchy level. ■ IFL redundancy state—Stores redundancy state information needed for high availability (HA) operation. ■ Protocol family—Stores the information about the protocol family that PPP obtains from the kernel. | |

Table 65: show ppp statistics Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------|
| Type (continued) | <ul style="list-style-type: none"> ■ ML bundle settings—Multilink bundle settings. Stores the context information for a MLPPP bundle. ■ PPP LCP session—PPP Link Control Protocol session, used for establishing, configuring, and testing the data-link connection. Stores the information for an LCP session, such as negotiated options, current state, and statistics. ■ PPP NCP session—PPP Network Control Protocol (NCP) phase in the PPP link connection process. Stores the information for an NCP session, such as negotiated options, current state, address family, and statistics. ■ Physical interface—Stores the information about the physical interface that PPP obtains from the kernel. ■ Access profile—Stores the information found at the [edit access profile] hierarchy level for each profile. ■ ML wait entry—Created when there are MLPPP links joining a bundle. before its addition to the PPP process. Links are saved here, and when the bundle is added, are properly assigned to the bundle. ■ Group profile—Stores information set in the PPP stanza of a group profile, such as the primary and secondary Domain Name System (DNS), primary and secondary NDNS, and address pool name. ■ Profile client—Stores the per-client information of the access profile (information obtained from the [set access profile name client client-name] hierarchy level. ■ PPP Auth session—PPP authentication session. Stores all the session-specific authentication protocol parameters. ■ Logical interface—Stores the information about the logical interface that PPP obtains from the kernel. ■ Non-tagged—Generic catch-all for allocations not of a particular structure type. | detail |
| Total | Total memory allocations. | detail |
| Size | Size of the structure. | detail |
| Active | Number of instances of the structure that are used. | detail |
| Free | Number of instances of the structure that are on the free list. Types with a number in the Free column are pooled structures, and are typically types that are often used. | detail |
| Limit | Maximum number of instances that can be on the free list. Types with a number in the Limit column are pooled structures, and are typically types that are often used. | detail |
| Total size | Total amount of memory being used by a type of structure (includes active and free instances). | detail |
| Requests | Number of allocation requests made by a type of structure. | detail |
| Failures | Number of failed allocations. | detail |

```

show ppp statistics user@host> show ppp statistics detail
detail Session statistics from PPP process
    Total sessions: 0
    Sessions in disabled phase : 0
    Sessions in establish phase : 0
    Sessions in authenticate phase: 0
    Sessions in network phase : 0
    Bundles in pending phase : 0

```

| Type | Size | Active | Free | Limit | Total size | Requests | Failures |
|----------------------|------|--------|------|-------|------------|----------|----------|
| Queued rtsock msgs | 28 | 0 | 0 | 65535 | 0 | 0 | |
| PPP session | 60 | 0 | | | 0 | 0 | |
| Interface address | 64 | 0 | 0 | 65535 | 0 | 0 | |
| Destination profile | 65 | 0 | | | 0 | 0 | |
| ML link settings | 68 | 0 | | | 0 | 0 | |
| IPCP blocked address | 68 | 0 | | | 0 | 0 | |
| PPP session trace | 76 | 0 | | | 0 | 0 | |
| IFL redundancy state | 76 | 0 | | | 0 | 0 | |
| Protocol family | 84 | 0 | 0 | 65535 | 0 | 0 | |
| ML bundle settings | 108 | 0 | | | 0 | 0 | |
| PPP LCP session | 120 | 0 | | | 0 | 0 | |
| PPP NCP session | 124 | 0 | | | 0 | 0 | |
| Physical interface | 124 | 170 | 0 | 65535 | 21080 | 170 | |
| Access profile | 132 | 0 | | | 0 | 0 | |
| ML wait entry | 144 | 0 | 0 | 20 | 0 | 0 | |
| Group profile | 164 | 0 | | | 0 | 0 | |
| Profile client | 272 | 0 | | | 0 | 0 | |
| PPP Auth session | 356 | 0 | | | 0 | 0 | |
| Logical interface | 524 | 0 | 0 | 65535 | 0 | 0 | |
| Non-tagged | | | | | 8 | 2 | |
| Total | | | | | 21088 | 172 | 0 |

show ppp summary

| | |
|---------------------------------|---|
| Syntax | show ppp summary |
| Release Information | Command introduced in JUNOS Release 7.5. |
| Description | Display PPP session summary information. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show ppp summary on page 303 |
| Output Fields | Table 66 on page 303 lists the output fields for the <code>show ppp summary</code> command. Output fields are listed in the approximate order in which they appear. |

Table 66: show ppp summary Output Fields

| Field Name | Field Description |
|---------------|--|
| Interface | Interface on which the PPP session is running. |
| Session type | Type of session: PPP or Cisco-HDLC. |
| Session phase | PPP process phases: Authenticate, Pending, Establish, Network, Disabled. |
| Session flags | Special conditions present in the session, such as Bundled, TCC, No-keepalives, Looped, Monitored, and NCP-only. |

```

user@host> show ppp summary
Interface      Session type  Session phase  Session flags
at-4/0/0.456   PPP          Network       NCP-only
lsq-0/3/0.0    PPP          Disabled
lsq-1/0/0.0    PPP          Disabled
r1sq0.0        PPP          Network
so-1/0/0.0     PPP          Authenticate
so-1/0/1.0     PPP          Disabled      Looped
so-2/0/0.0     Cisco-HDLC   Establish
so-4/0/0.0     PPP          Establish      Monitored
t1-1/3/0:1.0   PPP          Network       Bundled
t1-1/3/0:2.0   PPP          Network       Bundled

```


Chapter 9

PPPoE Interface Operational Mode Commands

Table 67 on page 305 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Point-to-Point Protocol over Ethernet (PPPoE) interfaces. Commands are listed in alphabetical order.

Table 67: PPPoE Interfaces Operational Mode Commands

| Task | Command |
|---|-------------------------|
| Clear PPPoE sessions. | clear pppoe sessions |
| Clear PPPoE session statistics. | clear pppoe statistics |
| Display interface-specific information about PPPoE-configured interfaces. | show interfaces (PPPoE) |
| Display session-specific information about PPPoE-configured interfaces | show pppoe interfaces |
| Display PPPoE session statistics. | show pppoe statistics |
| Display PPPoE version information. | show pppoe version |



NOTE: PPPoE interfaces are supported on Fast Ethernet and ATM-over-ADSL and ATM-over-SHDSL interfaces on the J-series routing platform. PPPoE interfaces connect multiple PPPoE-client hosts on an Ethernet LAN to a remote site through a J-series Services Router. The J-series router can only be configured as a PPPoE client. Hosts share a common digital subscriber line (DSL), a cable modem, or a wireless connection to the Internet. For information about how to configure PPPoE interfaces, see the *J-series Services Router Basic LAN and WAN Access Configuration Guide* or the *JUNOS Network Interfaces Configuration Guide*.

For information about monitoring and troubleshooting Fast Ethernet interfaces, see “Ethernet Interface Operational Mode Commands” on page 97.

For information about monitoring and troubleshooting ATM-over-ADSL and ATM-over-SHDSL, interfaces, see “ATM Interface Operational Mode Commands” on page 397.

clear pppoe sessions

| | |
|---------------------------------|--|
| Syntax | clear pppoe sessions <interface <i>interface-name</i> > |
| Release Information | Command introduced in JUNOS Release 7.5. |
| Description | (J-series routing platforms and M120 routers only) Reset PPPoE sessions. |
| Options | none—Reset PPPoE sessions for all interfaces. interface <i>interface-name</i> —(Optional) Reset PPPoE sessions for the specified interface. |
| Required Privilege Level | clear |
| Related Topics | show pppoe interfaces |
| List of Sample Output | clear pppoe sessions on page 307 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear pppoe sessions | user@host> clear pppoe sessions |

clear pppoe statistics

| | |
|---------------------------------|--|
| Syntax | clear pppoe statistics <interface <i>interface-name</i> > |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platforms and M120 routers only) Reset PPPoE session statistics information. |
| Options | none—Reset PPPoE statistics for all interfaces. interface <i>interface-name</i> —(Optional) Reset PPPoE statistics for the specified interface. |
| Required Privilege Level | clear |
| Related Topics | show pppoe statistics |
| List of Sample Output | clear pppoe statistics on page 308 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear pppoe statistics | user@host> clear pppoe statistics |

show interfaces (PPPoE)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>pp0.logical</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series Services Routers and M120 Internet routers only) Display status information about the PPPoE interface. |
| Options | <p><i>pp0.logical</i>—Display standard status information about the PPPoE interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about PPPoE interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display PPPoE interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (PPPoE) on page 314</p> <p>show interfaces brief (PPPoE) on page 314</p> <p>show interfaces detail (PPPoE) on page 315</p> <p>show interfaces detail (PPPoE on J-series Services Routers) on page 315</p> <p>show interfaces extensive (PPPoE on M120 Internet Router) on page 316</p> |
| Output Fields | Table 68 on page 309 lists the output fields for the show interfaces (PPPoE) command. Output fields are listed in the approximate order in which they appear. |

Table 68: show interfaces (PPPoE) Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 68: show interfaces (PPPoE) Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------|---|------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Physical interface type (PPPoE). | All levels |
| Link-level type | Encapsulation on the physical interface (PPPoE). | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source. It can be Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Physical interface link type: full duplex or half duplex . | All levels |
| Link flags | Information about the interface. Possible values are described in “Link Flags” on page 91. | All levels |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Physical Info | Physical interface information. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | MAC address of the hardware. | detail extensive |
| Alternate link address | Backup address of the link. | detail extensive |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 68: show interfaces (PPPoE) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| IPv6 transit statistics | <p>Number of IPv6 transit bytes and packets received and transmitted on the physical interface if IPv6 statistics tracking is enabled.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <p>Input errors on the interface:</p> <ul style="list-style-type: none"> ■ Errors—Sum of incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of B chip Tx drops and IXP Tx net transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions —Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of B chip Tx drops and IXP Tx net transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number (which reflects its initialization sequence). | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |

Table 68: show interfaces (PPPoE) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|------------------|
| Encapsulation | Type of encapsulation configured on the logical interface. | All levels |
| PPPoE | PPPoE status: <ul style="list-style-type: none"> ■ State—State of the logical interface (up or down). ■ Session ID—PPPoE session ID. ■ Service name—Type of service required. Can be used to indicate an Internet service provider (ISP) name or a class or quality of service. ■ Configured AC name—Configured access concentrator name. ■ Auto-reconnect timeout—Time after which to try to reconnect after a PPPoE session is terminated, in seconds. ■ Idle Timeout—Length of time (in seconds) that a connection can be idle before disconnecting. ■ Underlying interface—Interface on which PPPoE is running. | All levels |
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. This counter usually takes less than 1 second to stabilize. | detail extensive |
| IPv6 transit statistics | Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. This counter usually takes less than 1 second to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. This counter usually takes less than 1 second to stabilize. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval seconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count number—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive |

Table 68: show interfaces (PPPoE) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------------|--|-----------------------|
| Keepalive statistics | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time the last keepalive packet was received, in the format <i>hh:mm:ss</i>. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. | detail extensive |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| LCP state | (PPP) Link Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | none detail extensive |
| NCP state | (PPP) Network Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |
| CHAP state | (PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction. <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | none detail extensive |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <i>inet</i> , the IP address of the interface is also displayed. | brief |

Table 68: show interfaces (PPPoE) Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------|---|-----------------------|
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive none |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the addresses configured for the protocol family. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |

```

show interfaces (PPPoE) user@host> show interfaces pp0
Physical interface: pp0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 24
  Type: PPPoE, Link-level type: PPPoE, MTU: 1532
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link type      : Full-Duplex
  Link flags     : None
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)

Logical interface pp0.0 (Index 72) (SNMP ifIndex 72)
  Flags: Hardware-Down Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
  PPPoE:
    State: SessionDown, Session ID: None,
    Service name: None, Configured AC name: sapphire,
    Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
    Underlying interface: at-5/0/0.0 (Index 70)
  Input packets : 0
  Output packets: 0
  LCP state: Not-configured
  NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Closed
    Protocol inet, MTU: 100
    Flags: User-MTU, Negotiate-Address

show interfaces brief (PPPoE) user@host> show interfaces pp0 brief
Physical interface: pp0, Enabled, Physical link is Up
  Type: PPPoE, Link-level type: PPPoE, MTU: 1532, Speed: Unspecified
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps

Logical interface pp0.0

```

```

Flags: Hardware-Down Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
PPPoE:
  State: SessionDown, Session ID: None,
  Service name: None, Configured AC name: sapphire,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: at-5/0/0.0 (Index 70)
inet

```

**show interfaces detail
(PPPoE)**

```

user@host> show interfaces pp0 detail
Physical interface: pp0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 24, Generation: 9
Type: PPPoE, Link-level type: PPPoE, MTU: 1532, Speed: Unspecified
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link type : Full-Duplex
Link flags : None
Physical info : Unspecified
Hold-times : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Logical interface pp0.0 (Index 72) (SNMP ifIndex 72) (Generation 14)
Flags: Hardware-Down Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
PPPoE:
  State: SessionDown, Session ID: None,
  Service name: None, Configured AC name: sapphire,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: at-5/0/0.0 (Index 70)
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Transit statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
LCP state: Not-configured
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
Protocol inet, MTU: 100, Generation: 14, Route table: 0
Flags: User-MTU, Negotiate-Address

```

**show interfaces detail
(PPPoE on J-series
Services Routers)**

```

user@host> show interfaces pp0 detail
Physical interface: pp0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 24, Generation: 9
Type: PPPoE, Link-level type: PPPoE, MTU: 1532, Speed: Unspecified
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps

```

```

Link type      : Full-Duplex
Link flags     : None
Physical info  : Unspecified
Hold-times    : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Statistics last cleared: Never
Traffic statistics:
Input bytes   :                0                0 bps
Output bytes  :                0                0 bps
Input packets :                0                0 pps
Output packets:               0                0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
Policed discards: 0, Resource errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
Resource errors: 0

Logical interface pp0.0 (Index 72) (SNMP ifIndex 72) (Generation 14)
Flags: Hardware-Down Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
PPPoE:
State: SessionDown, Session ID: None,
Service name: None, Configured AC name: sapphire,
Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
Underlying interface: at-5/0/0.0 (Index 70)
Traffic statistics:
Input bytes   :                0
Output bytes  :                0
Input packets :                0
Output packets:               0
Local statistics:
Input bytes   :                0
Output bytes  :                0
Input packets :                0
Output packets:               0
Transit statistics:
Input bytes   :                0                0 bps
Output bytes  :                0                0 bps
Input packets :                0                0 pps
Output packets:               0                0 pps
LCP state: Not-configured
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
Protocol inet, MTU: 100, Generation: 14, Route table: 0
Flags: User-MTU, Negotiate-Address

```

**show interfaces
extensive (PPPoE on
M120 Internet Router)**

```

user@host> show interfaces pp0 extensive
Physical interface: pp0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 93, Generation: 129
Type: PPPoE, Link-level type: PPPoE, MTU: 1532, Speed: Unspecified
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link type      : Full-Duplex
Link flags     : None
Physical info  : Unspecified
Hold-times    : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Statistics last cleared: Never

```



```

Traffic statistics:
Input bytes :          972192          0 bps
Output bytes :          975010          0 bps
Input packets:          1338          0 pps
Output packets:         1473          0 pps
IPv6 transit statistics:
Input bytes :           0
Output bytes :           0
Input packets:           0
Output packets:          0
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0, Policed discards:
0,
Resource errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0, Resource errors:
0

Logical interface pp0.0 (Index 69) (SNMP ifIndex 96) (Generation 194)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
PPPoE:
State: SessionUp, Session ID: 26,
Session AC name: None, AC MAC address: 00:17:cb:48:c8:12,
Service name: None, Configured AC name: None,
Auto-reconnect timeout: Never, Idle timeout: Never,
Underlying interface: ge-3/0/1.0 (Index 67)
Traffic statistics:
Input bytes :          252
Output bytes :          296
Input packets:           7
Output packets:           8
IPv6 transit statistics:
Input bytes :           0
Output bytes :           0
Input packets:           0
Output packets:          0
Local statistics:
Input bytes :          252
Output bytes :          296
Input packets:           7
Output packets:           8
Transit statistics:
Input bytes :           0          0 bps
Output bytes :           0          0 bps
Input packets:           0          0 pps
Output packets:           0          0 pps
IPv6 transit statistics:
Input bytes :           0
Output bytes :           0
Input packets:           0
Output packets:          0
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
Input : 1 (last seen 00:00:00 ago)
Output: 1 (last sent 00:00:03 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
PAP state: Closed
Protocol inet, MTU: 1492, Generation: 171, Route table: 0

```

```
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 12.12.12.2, Local: 12.12.12.1, Broadcast: Unspecified,
Generation: 206
```

show pppoe interfaces

| | |
|---------------------------------|--|
| Syntax | show pppoe interfaces <brief detail extensive> <pp0.logical/> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series Services Routers and M120 Internet routers only) Displays session-specific information about PPPoE interfaces. |
| Options | none—Display interface information for all PPPoE interfaces. brief detail extensive—(Optional) Display the specified level of output. pp0.logical—(Optional) Name of an interface. The logical unit number can be a value from 0 to 16385. |
| Required Privilege Level | view |
| List of Sample Output | show pppoe interfaces on page 320 show pppoe interfaces brief on page 320 show pppoe interfaces detail on page 320 show pppoe interfaces extensive on page 321 |
| Output Fields | Table 69 on page 319 lists the output fields for the show pppoe interfaces command. Output fields are listed in the approximate order in which they appear. |

Table 69: show pppoe interfaces Output Fields

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface, which reflects its initialization sequence. | detail extensive none |
| State | State of the logical interface: up or down. | detail extensive none |
| Session ID | Session ID. | detail extensive none |
| Service name | Type of service required (can be used to indicate an ISP name or a class or quality of service). | detail extensive none |
| Configured AC name | Configured access concentrator name. | detail extensive none |
| Session AC name | Name of the access concentrator. | detail extensive none |
| AC MAC address | MAC address of the access concentrator. | detail extensive none |
| Auto-reconnect timeout | Time after which to try to reconnect after a PPPoE session is terminated, in seconds. | detail extensive none |

Table 69: show pppoe interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------------|
| Idle timeout | Length of time (in seconds) that a connection can be idle before disconnecting. | detail extensive none |
| Underlying interface | Interface on which PPPoE is running. | All levels |
| Packet Type | Number of packets sent and received during the PPPoE session, categorized by packet type and packet errors: <ul style="list-style-type: none"> ■ PADI—PPPoE Active Discovery Initiation packets. ■ PADO—PPPoE Active Discovery Offer packets. ■ PADR—PPPoE Active Discovery Request packets. ■ PADS—PPPoE Active Discovery Session-Confirmation packets. ■ PADT—PPPoE Active Discovery Termination packets. ■ Service name error—Packets for which the Service-Name request could not be honored. ■ AC system error—Packets for which the access concentrator experienced an error in performing the host request. For example, the host had insufficient resources to create a virtual circuit. ■ Generic error—Packets that indicate an unrecoverable error occurred. ■ Malformed packets—Malformed or short packets that caused the packet handler to discard the frame as unreadable. ■ Unknown packets—Unrecognized packets. | extensive |
| Timeout | Information about timeouts that occurred during the PPPoE session: <ul style="list-style-type: none"> ■ PADI—No PADO packet has been received within the timeout period. ■ PADO—No PADR packet has been received within the timeout period. (This value is always zero and is not supported.) ■ PADR—No PADS packet has been received within the timeout period. | extensive |

```

show pppoe interfaces user@host> show pppoe interfaces
pp0.0 Index 66
  State: Down, Session ID: None,
  Service name: None, Configured AC name: sapphire,
  Session AC name: None, AC MAC address: 00:00:00:00:00:00,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: at-5/0/0.0 Index 71

show pppoe interfaces brief user@host> show pppoe interfaces brief
Interface    Underlying interface  State    AC
-----
pp0.0        at-5/0/0.0           Down     None
              None                 None     00:00:00:00:00:00

show pppoe interfaces detail user@host> show pppoe interfaces detail
pp0.0 Index 66
  State: Down, Session ID: None,
  Service name: None, Configured AC name: sapphire,
  Session AC name: None, AC MAC address: 00:00:00:00:00:00,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: at-5/0/0.0 Index 71

```

```

show pppoe interfaces user@host> show pppoe interfaces extensive
extensive pp0.0 Index 66
    State: Down, Session ID: None,
    Service name: None, Configured AC name: sapphire,
    Session AC name: None, AC MAC address: 00:00:00:00:00:00,
    Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
    Underlying interface: at-5/0/0.0 Index 71
    PacketType          Sent      Received
    PADI                 0         0
    PADO                 0         0
    PADR                 0         0
    PADS                 0         0
    PADT                 0         0
    Service name error   0         0
    AC system error      0         0
    Generic error        0         0
    Malformed packets    0         0
    Unknown packets      0         0
    Timeout
    PADI                 0
    PADO                 0
    PADR                 0

```

show pppoe statistics

| | |
|---------------------------------|--|
| Syntax | show pppoe statistics |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series Services Routers and M120 Internet routers only) Display statistics information about PPPoE interfaces. |
| Options | This command has no options. |
| Required Privilege Level | view |
| Related Topics | show ppp address-pool |
| List of Sample Output | show pppoe statistics on page 322 |
| Output Fields | Table 70 on page 322 lists the output fields for the show pppoe statistics command. Output fields are listed in the approximate order in which they appear. |

Table 70: show pppoe statistics Output Fields

| Field Name | Field Description |
|-----------------------|--|
| Active PPPoE sessions | <p>Total number of active PPPoE sessions and the number of packets sent and received during the PPPoE session, categorized by packet type and packet errors:</p> <ul style="list-style-type: none"> ■ PADI—PPPoE Active Discovery Initiation packets. ■ PADO—PPPoE Active Discovery Offer packets. ■ PADR—PPPoE Active Discovery Request packets. ■ PADS—PPPoE Active Discovery Session-Confirmation packets. ■ PADT—PPPoE Active Discovery Termination packets. ■ Service name error—Packets for which the Service-Name request could not be honored. ■ AC system error—Packets for which the access concentrator experienced an error in performing the host request. For example, the host had insufficient resources to create a virtual circuit. ■ Generic error—Packets that indicate an unrecoverable error occurred. ■ Malformed packets—Malformed or short packets that caused the packet handler to discard the frame as unreadable. ■ Unknown packets—Unrecognized packets. |
| Timeouts | <p>Information about timeouts that occurred during the PPPoE session:</p> <ul style="list-style-type: none"> ■ PADI—No PADR packet has been received within the timeout period. (This value is always zero and is not supported.) ■ PADO—No PPPoE Active Discovery Offer packet has been received within the timeout period. ■ PADR—No PADS packet has been received within the timeout period. |

```

show pppoe statistics  user@host> show pppoe statistics
                        Active PPPoE sessions: 1
                        PacketType           Sent      Received

```

| | | |
|--------------------|---|---|
| PADI | 0 | 0 |
| PADO | 0 | 0 |
| PADR | 0 | 0 |
| PADS | 0 | 0 |
| PADT | 0 | 0 |
| Service name error | 0 | 0 |
| AC system error | 0 | 0 |
| Generic error | 0 | 0 |
| Malformed packets | 0 | 0 |
| Unknown packets | 0 | 0 |
| Timeouts | | |
| PADI | 0 | |
| PADO | 0 | |
| PADR | 0 | |

show pppoe version

| | |
|---------------------------------|---|
| Syntax | show pppoe version |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series and M120 routing platforms only) Display version information about PPPoE. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show pppoe version on page 324 |
| Output Fields | Table 71 on page 324 lists the output fields for the show pppoe version command. Output fields are listed in the approximate order in which they appear. |

Table 71: show pppoe version Output Fields

| Field Name | Field Description |
|---------------------------|---|
| version <i>n</i> | PPPoE version number and RFC. For example, version 1, rfc 2516 . |
| PPPoE protocol | Shows whether the protocol is enabled or disabled. |
| Maximum Sessions | Maximum active sessions supported per router. The default is 256 sessions. |
| PADI resend timeout | Initial time, in seconds, that the router waits to receive a PADO packet for the PADI packet sent. This timeout doubles for each successive PADI packet sent. |
| PADR resend timeout | Initial time, in seconds, that the router waits to receive a PADS packet for the PADR packet sent. This timeout doubles for each successive PADR packet sent. |
| Max resend timeout | Maximum value, in seconds, that the PADI or PADR resend timer can accept. The maximum value is 64. |
| Max Configured AC timeout | Time, in seconds, during which the configured access concentrator must respond. |

```

show pppoe version  user@host> show pppoe version
                        Point-to-Point Protocol Over Ethernet, version 1. rfc2516
                        PPPoE protocol                = Enabled
                        Maximum Sessions                = 256
                        PADI resend timeout             = 2 seconds
                        PADR resend timeout             = 16 seconds
                        Max resend timeout              = 64 seconds
                        Max Configured AC timeout       = 4 seconds

```


Part 6

Serial Interfaces

- Serial Interface Operational Mode Commands on page 327

Chapter 10

Serial Interface Operational Mode Commands

Table 72 on page 327 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot serial interfaces. Commands are listed in alphabetical order.

Table 72: Serial Interface Operational Mode Commands

| Task | Command |
|---|--------------------------|
| Display status information about serial interfaces. | show interfaces (Serial) |

show interfaces (Serial)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about serial interfaces, including RS-232, RS-422/449, EIA-530, X.21, and V.35. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the interface type is <i>se-fpc/pic/port</i>. On the J-series routing platform, the interface type is <i>se-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Serial, EIA-530) on page 334</p> <p>show interfaces brief (Serial, EIA-530) on page 334</p> <p>show interfaces detail (Serial, EIA-530) on page 334</p> <p>show interfaces extensive (Serial, EIA-530) on page 335</p> <p>show interfaces (Serial, V.35) on page 336</p> <p>show interfaces brief (Serial, V.35) on page 337</p> <p>show interfaces detail (Serial, V.35) on page 337</p> <p>show interfaces extensive (Serial, V.35) on page 338</p> <p>show interfaces statistics detail (RS 449) on page 339</p> |
| Output Fields | Table 73 on page 328 lists the output fields for the show interfaces (Serial) command. Output fields are listed in the approximate order in which they appear. |

Table 73: show interfaces (Serial) Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---------------------------------|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |

Table 73: show interfaces (Serial) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------------|
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | Maximum transmission unit (MTU) size on the physical interface. | All levels |
| Maximum speed | Maximum speed. The nonconfigurable value is 16,384 kbps. | detail extensive none |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalive packets. <ul style="list-style-type: none"> ■ Interval seconds—Time between successive keepalive requests. The range of values, in seconds, is 10 to 32,767. The default value is 10. ■ Up-count number—Number of keepalive packets a destination must receive to change a link's status from down to up. The range of values is 1 to 255. The default value is 1. ■ Down-count number—Number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 to 255. The default value is 3. | All levels |
| Keepalive | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input: number (hh:mm:ss ago)—Number of keepalive packets received by PPP and the time since the last keepalive packet was received. ■ Output: number (hh:mm:ss ago)—Number of keepalive packets sent by PPP and the time since the last keepalive packet was sent. | brief none |
| Keepalive statistics | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input: number (last seen hh:mm:ss ago)—Number of keepalive packets received by PPP and the time since the last keepalive packet was received. ■ Output: number (last seen hh:mm:ss ago)—Number of keepalive packets sent by PPP and the time since the last keepalive packet was sent. | detail extensive |

Table 73: show interfaces (Serial) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| LCP state | (PPP) Link Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | (PPP) Network Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |
| CHAP state | (PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction. <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | detail extensive none |
| CoS queues | Number of CoS queues configured. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive none |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |

Table 73: show interfaces (Serial) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|------------------|
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeds the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |
| Egress queues supported | Total number of egress queues supported on the specified interface. Displayed with the statistics option. | detail extensive |
| Egress queues in use | Total number of egress queues in use on the specified interface. Displayed with the statistics option. | detail extensive |

Table 73: show interfaces (Serial) Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------|---|------------------|
| Queue counters | CoS queue number and its associated user-configured forwarding class name. Displayed with the statistics option. <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| Serial media information | Information about the physical media: <ul style="list-style-type: none"> ■ Line protocol—eia530, eia530a, rs232, rs449, v.35, or x.21.. ■ Resync history—Information about resynchronization events: <ul style="list-style-type: none"> ■ Sync loss count—Number of times the synchronization was lost. ■ Data signal—(X.21 and V.35) Information about the data signal: <ul style="list-style-type: none"> ■ Rx Clock—Receive clock status: OK (DTE is receiving the receive clock signal) or Not detected (receive clock signal is not being received). ■ Control signals—Information about modem control signals: <ul style="list-style-type: none"> ■ Local mode:DCE (data communication equipment) or DTE (data terminal equipment) ■ To DCE—Control signals that the Serial PIC sent to the DCE: DTR (Data Terminal Ready: up or down) or RTS (Request To Send: up or down.) ■ From DC—Control signals that the Serial PIC received from the DCE: CTS (Clear To Send: up or down), DCD (Data Carrier Detect: up or down), DSR (Data Set Ready: up or down), or TM (Test Mode: up or down). ■ Clocking mode—Clocking used for the transmit clock: <ul style="list-style-type: none"> ■ dte—Transmit clock is generated by DTE. ■ dce—Transmit clock is generated by the DCE and is looped back as the transmit clock. ■ loop-timed—Receive clock from the DCE is looped back as the transmit clock. ■ Clock rate—Rate, in megahertz (MHz), at which the clock is configured. ■ Loopback—Configured loopback mode for the interface: dce-remote, dce-local, liu, local, or none. ■ Tx clock—Clocking phase of the transmit clock: invert (transmit clock polarity is inverted) or non-invert (transmit clock polarity is not inverted). ■ Line encoding—Type of line encoding used: nrz (nonreturn to zero) or nrzi (return to zero inverted). | detail extensive |

Table 73: show interfaces (Serial) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—The queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. ■ Bandwidth <i>bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. ■ Buffer <i>usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority. Possible values are low and high. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are none and exact. If exact is configured, the queue transmits only up to the configured bandwidth, even if there is excess bandwidth available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is inet , the source and destination address are also displayed. | brief |
| Protocol | Protocol family configured on the logical interface, such as iso , inet6 , mpls . | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0 . | detail extensive |
| Flags | Information about protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |

Table 73: show interfaces (Serial) Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|---|-----------------------|
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces se-5/0/1
(Serial, EIA-530)  Physical interface: se-5/0/1, Enabled, Physical link is Up
                    Interface index: 144, SNMP ifIndex: 41
                    Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
                    Device flags   : Present Running
                    Interface flags: Point-To-Point Internal: 0x4000
                    Link flags     : Keepalives
                    Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
                    Keepalive: Input: 32 (00:00:10 ago), Output: 31 (00:00:07 ago)
                    LCP state: Opened
                    NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
                    Not-configured
                    CHAP state: Closed
                    CoS queues      : 8 supported, 8 maximum usable queues
                    Last flapped    : 2006-04-26 15:10:18 PDT (00:05:22 ago)
                    Input rate      : 0 bps (0 pps)
                    Output rate     : 0 bps (0 pps)

                    Logical interface se-5/0/1.0 (Index 71) (SNMP ifIndex 45)
                    Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
                    Protocol inet, MTU: 1500
                    Flags: None
                    Addresses, Flags: Is-Preferred Is-Primary
                    Destination: 12.0.0.0/30, Local: 12.0.0.1, Broadcast: 12.0.0.3

```

```

show interfaces brief user@host> show interfaces se-5/0/1 brief
(Serial, EIA-530)  Physical interface: se-5/0/1, Enabled, Physical link is Up
                    Type: Serial, Link-level type: PPP, MTU: 1504
                    Device flags   : Present Running
                    Interface flags: Point-To-Point Internal: 0x4000
                    Link flags     : Keepalives
                    Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
                    Keepalive: Input: 235 (00:00:10 ago), Output: 234 (00:00:00 ago)

                    Logical interface se-5/0/1.0
                    Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
                    inet 12.0.0.1/30

```

```

show interfaces detail user@host> show interfaces se-5/0/1 detail
(Serial, EIA-530)  Physical interface: se-5/0/1, Enabled, Physical link is Up
                    Interface index: 144, SNMP ifIndex: 41, Generation: 25
                    Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
                    Device flags   : Present Running
                    Interface flags: Point-To-Point Internal: 0x4000
                    Link flags     : Keepalives
                    Hold-times      : Up 0 ms, Down 0 ms
                    Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
                    Keepalive statistics:

```

```

    Input : 37 (last seen 00:00:06 ago)
    Output: 35 (last sent 00:00:01 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
CoS queues      : 8 supported, 8 maximum usable queues
Last flapped    : 2006-04-26 15:10:18 PDT (00:06:02 ago)
Statistics last cleared: Never
Traffic statistics:
Input  bytes :                928                40 bps
Output bytes :               1023                48 bps
Input  packets:                 76                 0 pps
Output packets:                 77                 0 pps
Serial media information:
Line protocol: eia530
Resync history:
  Sync loss count: 0
Data signal:
  Rx Clock: OK
Control signals:
  Local mode: DTE
  To DCE: DTR: up, RTS: up
  From DCE: CTS: up, DCD: up, DSR: up
Clocking mode: loop-timed
Clock rate: 8.0 MHz
Loopback: none
Tx clock: non-invert
Line encoding: nrz

Logical interface se-5/0/1.0 (Index 71) (SNMP ifIndex 45) (Generation 9)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 15, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 12.0.0.0/30, Local: 12.0.0.1, Broadcast: 12.0.0.3,
Generation: 23

```

**show interfaces
extensive
(Serial, EIA-530)**

```

user@host> show interfaces se-5/0/1 extensive
Physical interface: se-5/0/1, Enabled, Physical link is Up
Interface index: 144, SNMP ifIndex: 41, Generation: 25
Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
Device flags      : Present Running
Interface flags: Point-To-Point Internal: 0x4000
Link flags        : Keepalives
Hold-times        : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 40 (last seen 00:00:00 ago)
  Output: 37 (last sent 00:00:09 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
CoS queues      : 8 supported, 8 maximum usable queues
Last flapped    : 2006-04-26 15:10:18 PDT (00:06:28 ago)
Statistics last cleared: Never
Traffic statistics:
Input  bytes :                988                40 bps
Output bytes :               1088                48 bps
Input  packets:                 81                 0 pps

```

```

Output packets:                82                0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 2, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0
Serial media information:
  Line protocol: eia530
  Resync history:
    Sync loss count: 0
  Data signal:
    Rx Clock: OK
  Control signals:
    Local mode: DTE
    To DCE: DTR: up, RTS: up
    From DCE: CTS: up, DCD: up, DSR: up
  Clocking mode: loop-timed
  Clock rate: 8.0 MHz
  Loopback: none
  Tx clock: non-invert
  Line encoding: nrz
Packet Forwarding Engine configuration:
  Destination slot: 5, PLP byte: 1 (0x00)


| CoS transmit queue | %  | Bandwidth<br>bps | %  | Buffer<br>usec | Priority | Limit |
|--------------------|----|------------------|----|----------------|----------|-------|
| 0 best-effort      | 95 | 15564800         | 95 | 0              | low      | none  |
| 3 network-control  | 5  | 819200           | 5  | 0              | low      | none  |


Logical interface se-5/0/1.0 (Index 71) (SNMP ifIndex 45) (Generation 9)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 15, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 12.0.0.0/30, Local: 12.0.0.1, Broadcast: 12.0.0.3,
  Generation: 23

```

show interfaces
(Serial, V.35)

```

user@host> show interfaces se-5/0/0
Physical interface: se-5/0/0, Enabled, Physical link is Down
Interface index: 150, SNMP ifIndex: 39
Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
Device flags   : Present Running Down
Interface flags: Hardware-Down Point-To-Point Internal: 0x4000
Link flags     : Loose-NCP
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive: Input: 0 (never), Output: 0 (never)
LCP state: Down
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
CoS queues    : 8 supported, 8 maximum usable queues
Last flapped  : 2006-04-26 14:51:27 PDT (01:02:23 ago)
Input rate    : 0 bps (0 pps)
Output rate   : 0 bps (0 pps)

Logical interface se-5/0/0.0 (Index 73) (SNMP ifIndex 27)
Flags: Hardware-Down Device-Down Point-To-Point SNMP-Traps
Encapsulation: PPP
Protocol inet, MTU: 1500
Flags: Protocol-Down

```

Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
 Destination: 13.0.0.0/30, Local: 13.0.0.2, Broadcast: 13.0.0.3

show interfaces brief
(Serial, V.35)

```
user@host> show interfaces se-5/0/0 brief
Physical interface: se-5/0/0, Enabled, Physical link is Down
Type: Serial, Link-level type: PPP, MTU: 1504
Device flags   : Present Running Down
Interface flags: Hardware-Down Point-To-Point Internal: 0x4000
Link flags     : Loose-NCP
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive: Input: 0 (never), Output: 0 (never)

Logical interface se-5/0/0.0
Flags: Hardware-Down Device-Down Point-To-Point SNMP-Traps
Encapsulation: PPP
inet 13.0.0.2/30
```

show interfaces detail
(Serial, V.35)

```
user@host> show interfaces se-5/0/0 detail
Physical interface: se-5/0/0, Enabled, Physical link is Down
Interface index: 150, SNMP ifIndex: 39, Generation: 31
Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
Device flags   : Present Running Down
Interface flags: Hardware-Down Point-To-Point Internal: 0x4000
Link flags     : Loose-NCP
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)
LCP state: Down
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
CoS queues   : 8 supported, 8 maximum usable queues
Last flapped : 2006-04-26 14:51:27 PDT (01:03:15 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes   : 0          0 bps
  Output bytes  : 0          0 bps
  Input packets: 0          0 pps
  Output packets: 0         0 pps
Serial media information:
  Line protocol: v.35
  Resync history:
    Sync loss count: 0
  Data signal:
    Rx Clock: Not Detected
  Control signals:
    Local mode: DCE
    To DTE: CTS: down, DCD: down, DSR: up
    From DTE: DTR: down, RTS: down
  DCE loopback override: Off
  Clocking mode: internal
  Clock rate: 38.4 KHz
  Loopback: none
  Tx clock: non-invert
  Line encoding: nrz

Logical interface se-5/0/0.0 (Index 73) (SNMP ifIndex 27) (Generation 12)
Flags: Hardware-Down Device-Down Point-To-Point SNMP-Traps
Encapsulation: PPP
```

```

Protocol inet, MTU: 1500, Generation: 17, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 13.0.0.0/30, Local: 13.0.0.2, Broadcast: 13.0.0.3,
Generation: 23

```

```

show interfaces user@host> show interfaces se-5/0/0 extensive
extensive (Serial, V.35) Physical interface: se-5/0/0, Enabled, Physical link is Down
Interface index: 150, SNMP ifIndex: 39, Generation: 31
Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
Device flags : Present Running Down
Interface flags: Hardware-Down Point-To-Point Internal: 0x4000
Link flags : Loose-NCP
Hold-times : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)
LCP state: Down
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Closed
CoS queues : 8 supported, 8 maximum usable queues
Last flapped : 2006-04-26 14:51:27 PDT (01:04:17 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0
Serial media information:
  Line protocol: v.35
  Resync history:
    Sync loss count: 0
  Data signal:
    Rx Clock: Not Detected
  Control signals:
    Local mode: DCE
    To DTE: CTS: down, DCD: down, DSR: up
    From DTE: DTR: down, RTS: down
  DCE loopback override: Off
  Clocking mode: internal
  Clock rate: 38.4 KHz
  Loopback: none
  Tx clock: non-invert
  Line encoding: nrz
Packet Forwarding Engine configuration:
  Destination slot: 5, PLP byte: 1 (0x00)
  CoS transmit queue      Bandwidth      Buffer      Priority  Limit
                        %      bps      %      usec
  0 best-effort           95      15564800  95      0        low     none
  3 network-control       5       819200   5       0        low     none

Logical interface se-5/0/0.0 (Index 73) (SNMP ifIndex 27) (Generation 12)
Flags: Hardware-Down Device-Down Point-To-Point SNMP-Traps

```

**show interfaces
statistics detail (RS
449)**

```

Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 17, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 13.0.0.0/30, Local: 13.0.0.2, Broadcast: 13.0.0.3,
Generation: 23

user@host> show interfaces se-6/0/0 statistics detail
Interface index: 149, SNMP ifIndex: 59, Generation: 150
Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 8mbps
Device flags : Present Running
Interface flags: Point-To-Point Internal: 0x4000
Link flags : No-Keepalives Loose-NCP
Hold-times : Up 0 ms, Down 0 ms
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
PAP state: Closed
CoS queues : 8 supported, 8 maximum usable queues
Last flapped : 2007-11-28 19:38:36 PST (00:14:06 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 744 0 bps
Output bytes : 5978 0 bps
Input packets: 33 0 pps
Output packets: 129 0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0, Policed discards:
0,
Resource errors: 0
Output errors:
Carrier transitions: 13, Errors: 0, Drops: 0, MTU errors: 0, Resource errors:
0
Egress queues: 8 supported, 5 in use
Queue counters: Queued packets Transmitted packets Dropped packets

0 best-effort 24 24 0
1 expedited-fo 0 0 0
2 bulk 0 0 0
3 assured-forw 105 105 0
4 voip 0 0 0

Serial media information:
Line protocol: rs449
Resync history:
Sync loss count: 0
Data signal:
Rx Clock: OK
Control signals:
Local mode: DTE
To DCE: DTR: up, RTS: up
From DCE: CTS: up, DCD: up, DSR: up
Clocking mode: internal
Loopback: none
Tx clock: non-invert
Line encoding: nrz

```

```
Logical interface se-6/0/0.0 (Index 75) (SNMP ifIndex 69) (Generation 141)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  Protocol inet, MTU: 256, Generation: 145, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 11.11.11/24, Local: 11.11.11.2, Broadcast: 11.11.11.255,
    Generation: 157
```


Part 7

Optical Interfaces

- SONET/SDH Interface Operational Mode Commands on page 343

Chapter 11

SONET/SDH Interface Operational Mode Commands

Table 74 on page 343 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot aggregated SONET/SDH interfaces and SONET/SDH interfaces. Commands are listed in alphabetical order.

Table 74: SONET/SDH Interface Operational Mode Commands

| Task | Command |
|--|---|
| Monitor Automatic Protection Switching (APS) information. | <code>show aps</code> |
| Display status information about aggregated SONET/SDH interfaces. | <code>show interfaces (Aggregated SONET/SDH)</code> |
| Display status information about SONET/SDH interfaces. | <code>show interfaces (SONET/SDH)</code> |
| Display the transceiver temperature, laser bias current, laser output power, receive optical power, and related alarms for SONET interfaces. | <code>show interfaces diagnostics optics (SONET)</code> |

For more information about monitoring and troubleshooting SONET interfaces, see “Investigate SONET Interfaces” in the *JUNOS Interfaces Network Operations Guide*.

show aps

| | |
|---------------------------------|--|
| Syntax | show aps <brief detail extensive summary> <group <i>group</i> interface <i>so-fpc/pic/port</i> > |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display information about Automatic Protection Switching (APS). |
| Options | <p>none—(Same as brief) Display brief information about APS for all groups and SONET/SDH interfaces.</p> <p>brief detail extensive summary—(Optional) Display the specified level of output.</p> <p>group <i>group</i>—(Optional) Display APS information for the specified group.</p> <p>interface <i>so-fpc/pic/port</i>—(Optional) Display APS information for the specified SONET/SDH interface.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show aps on page 346</p> <p>show aps brief on page 346</p> <p>show aps detail on page 346</p> <p>show aps extensive on page 347</p> |
| Output Fields | Table 75 on page 345 lists the output fields for the show aps command. Output fields are listed in the approximate order in which they appear. |

Table 75: show aps Output Fields

| Field Name | Field Description | Level of Output |
|-----------------------|---|------------------|
| Interface | Name of the SONET/SDH interface. | All levels |
| Group | Group name. | All levels |
| Circuit | Circuit type: Working or Protect . | All levels |
| Intf state | <p>State of the circuit and interface in the format <i>circuit-state</i>, <i>interface-state</i>:</p> <p>For <i>circuit-state</i>:</p> <ul style="list-style-type: none"> ■ enabled ■ disabled ■ invalid ■ unknown <p>For <i>interface-state</i>:</p> <ul style="list-style-type: none"> ■ admin down ■ degraded ■ down ■ invalid ■ nonexistent ■ unknown ■ up | All levels |
| Neighbor | Address and state of neighbor interface. If the working and protect interfaces are on the same router, the neighbor address is displayed as 0.0.0.0. | detail extensive |
| adj | <p>State of the neighbor adjacency:</p> <ul style="list-style-type: none"> ■ Down ■ Init ■ Invalid ■ Unknown ■ Up | detail extensive |
| neighbor interface | State of the neighbor interface: enabled or disabled . | detail extensive |
| dead | Number of seconds before the neighbor is declared dead | detail extensive |
| Channel state | Circuit that has been selected: Working or Protect . | detail extensive |
| Local-mode | Mode in which the local router is configured to interoperate with SONET line-terminating equipment (LTE): unidirectional or bidirectional . The parenthetical value represents the mode type in the K2 byte. | extensive |
| neighbor-mode | Mode in which the neighboring device is operating: unidirectional or bidirectional . The parenthetical value represents the mode type in the K2 byte. | extensive |
| Protect circuit is on | Interface name of the APS protect circuit, displayed when both the working circuit and protect circuit are on the same router. | detail extensive |

Table 75: show aps Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------|---|------------------|
| Working circuit is on | Interface name of the APS working circuit, displayed when both the working circuit and protect circuit are on the same router. | detail extensive |
| Req K1 | Value of the SONET/SDH K1 byte requested to be transmitted by this circuit. | extensive |
| rcv K1 | Value of the SONET/SDH K1 byte received on this interface. (Valid only on the protect circuit.) | extensive |
| xmit K1 | Value of the SONET/SDH K1 byte being transmitted on this interface. (Valid only on the protect circuit.) | extensive |
| nbr K1 | Value of the SONET/SDH K1 byte requested to be transmitted by the neighbor. | extensive |
| nbr paired req | Nonzero if the neighbor is requesting a particular K1 value because of a change in the paired circuit. | extensive |
| Revert time | Configured time to wait after the working circuit has become functional before making the working circuit active again. | extensive |
| neighbor revert time | Configured time, on the neighbor interface, to wait after the working circuit has again become functional before making the working circuit active again. | extensive |
| Hello due in | Time until the next hello packet is sent. | extensive |

```

show aps      user@host> show aps
                Interface  Group          Circuit  Intf state
                so-0/0/0   aviva-aps     Working  enabled, up
                so-0/0/1   aviva-aps     Protect  disabled, up

```

show aps brief The output for the **show aps brief** command is identical to that for the **show aps** command. For sample output, see **show aps** on page 346.

```

show aps detail user@host> show aps detail
                Interface  Group          Circuit  Intf state
                so-0/0/0   aviva-aps     Working  enabled, up
                Neighbor 0.0.0.0, adj up, neighbor interface disabled, dead 2.987
                so-0/0/1   aviva-aps     Protect  disabled, up
                Neighbor 0.0.0.0, adj up, neighbor interface enabled, dead 2.147

```

```

show aps extensive  user@host> show aps extensive
Interface      Group                      Circuit  Intf state
so-0/0/0       aviva-aps                  Working  enabled, up
Neighbor 0.0.0.0, adj up, neighbor interface disabled, dead 2.511
Channel state Working
Protect circuit is on interface so-0/0/1
Local-mode bidirectional(5), neighbor-mode bidirectional(5)
Req K1 0x00, rcv K1 0x00, xmit K1 0x00, nbr K1 0x00, nbr paired req 0
Revert time 0, neighbor revert time 0
Hello due in 0.055
so-0/0/1       aviva-aps                  Protect  disabled, up
Neighbor 0.0.0.0, adj up, neighbor interface enabled, dead 2.230
Channel state Working
Working circuit is on interface so-0/0/0
Local-mode bidirectional(5), neighbor-mode bidirectional(5)
Req K1 0x00, rcv K1 0x00, xmit K1 0x00, nbr K1 0x00, nbr paired req 0
Revert time 0, neighbor revert time 0
Hello due in 0.416

```

show interfaces (Aggregated SONET/SDH)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>asnumber</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified aggregated SONET/SDH interface. |
| Options | <p><i>asnumber</i>—Display standard information about the specified aggregated SONET/SDH interface.</p> <p>brief detail extensive terse—(Optional) Display brief interface information.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Aggregated SONET) on page 351</p> <p>show interfaces brief (Aggregated SONET) on page 352</p> <p>show interfaces detail (Aggregated SONET) on page 352</p> <p>show interfaces extensive (Aggregated SONET) on page 353</p> |
| Output Fields | Table 76 on page 348 lists the output fields for the show interfaces (aggregated SONET/SDH) command. Output fields are listed in the approximate order in which they appear. |

Table 76: Aggregated SONET/SDH show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 76: Aggregated SONET/SDH show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Minimum links needed | Number of child links that must be operational for the aggregated interface to be operational. | detail extensive none |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval seconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ up-count number—The number of keepalive packets a destination must receive to change a link’s status from down to up. The range is 1 through 255, with a default of 1. ■ down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. | All levels |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number of bytes and packets received and transmitted on the physical interface, and the traffic rate in bits per seconds (bps). <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 76: Aggregated SONET/SDH show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeds the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface's index number (which reflects its initialization sequence). | detail extensive none |
| SNMP ifIndex | Logical interface's SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 76: Aggregated SONET/SDH show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------------|---|-----------------------|
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91 | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Bandwidth | Interface bandwidth. | detail extensive none |
| Statistics | <p>Information about fragments and packets received and sent by the router. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router.</p> <p>Statistics include input and output counts for packets, packets per second (pps), bytes, and bytes per second (Bps) for the following entities:</p> <ul style="list-style-type: none"> ■ Bundle—Information about bundles. ■ Link—Information about links used in the multilink operation. | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <i>inet</i> , the source and destination address are also displayed. | brief |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table <i>inet.0</i> . | detail extensive |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table <i>inet.0</i> . | detail extensive |

```

show interfaces      user@host> show interfaces as0
(Aggregated SONET) Physical interface: as0, Enabled, Physical link is Up
                        Interface index: 149, SNMP ifIndex: 45
                        Link-level type: PPP, MTU: 4474, Speed: 466560kbps, Minimum links needed: 1

```

```

Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Last flapped   : Never
Input rate     : 216 bps (1 pps)
Output rate    : 48 bps (0 pps)

```

```

Logical interface as0.0 (Index 79) (SNMP ifIndex 55)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  Bandwidth: 311040kbps
  Statistics
    Packets      pps      Bytes      bps
  Bundle:
    Input :      1178      1      11772      176
    Output:         0      0         0         0
  Protocol inet, MTU: 4470
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.100.1.1, Local: 10.100.1.2

```

**show interfaces brief
(Aggregated SONET)**

```

user@host> show interfaces as0 brief
Physical interface: as0, Enabled, Physical link is Up
Link-level type: PPP, MTU: 4474, Speed: 466560kbps
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3

Logical interface as0.0
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  inet 10.100.1.2    --> 10.100.1.1

```

**show interfaces detail
(Aggregated SONET)**

```

user@host> show interfaces as0 detail
Physical interface: as0, Enabled, Physical link is Up
Interface index: 149, SNMP ifIndex: 45, Generation: 32
Link-level type: PPP, MTU: 4474, Speed: 466560kbps, Minimum links needed: 1
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Last flapped   : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :      15888      272 bps
  Output bytes :       6189       48 bps
  Input packets:       1547        2 pps
  Output packets:        393        0 pps
Egress queues: 4 supported, 4 in use
Queue counters:
  Queued packets  Transmitted packets  Dropped packets

  0 best-effort           0              0              0
  1 expedited-fo          0              0              0
  2 assured-forw          0              0              0
  3 network-cont    196806      196806              0

```

```

Logical interface as0.0 (Index 79) (SNMP ifIndex 55) (Generation 18)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP

```

```

Bandwidth: 311040kbps
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :      1334      2      13332      232
  Output:      0      0      0      0
Link:
  so-0/0/0.0 <-- down
    Input :      0      0      0      0
    Output:      0      0      0      0
  so-0/0/1.0
    Input :      541      1      5406      120
    Output:      0      0      0      0
  so-0/0/2.0
    Input :      793      1      7926      112
    Output:      0      0      0      0
Protocol inet, MTU: 4470, Generation: 38, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.100.1.1, Local: 10.100.1.2, Broadcast: Unspecified,
Generation: 40

```

**show interfaces
extensive
(Aggregated SONET)**

```

userhost1> show interfaces as0 extensive
Physical interface: as0, Enabled, Physical link is Up
Interface index: 149, SNMP ifIndex: 45, Generation: 32
Link-level type: PPP, MTU: 4474, Speed: 466560kbps, Minimum links needed: 1
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Last flapped   : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes :      17562      136 bps
Output bytes :      6862      72 bps
Input packets:      1710      1 pps
Output packets:      436      0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
Policed discards: 0, Resource errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
Resource errors: 0
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets      Transmitted packets      Dropped packets

  0 best-effort      0      0      0
  1 expedited-fo      0      0      0
  2 assured-forw      0      0      0
  3 network-cont    196848    196848      0

Logical interface as0.0 (Index 79) (SNMP ifIndex 55) (Generation 18)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Bandwidth: 311040kbps
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :      1475      1      14742      136
  Output:      0      0      0      0

```

```

Link:
so-0/0/0.0 <-- down
  Input :          0          0          0          0
  Output:          0          0          0          0
so-0/0/1.0
  Input :          598          0          5976          24
  Output:           0          0           0           0
so-0/0/2.0
  Input :          877          1          8766          112
  Output:           0          0           0           0
Protocol inet, MTU: 4470, Generation: 38, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.100.1.1, Local: 10.100.1.2, Broadcast: Unspecified,
  Generation: 40

```

show interfaces (SONET/SDH)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>so-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified SONET/SDH interface. |
| Options | <p><i>so-fpc/pic/port</i>—Display standard information about the specified SONET/SDH interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (SDH Mode, PPP) on page 368</p> <p>show interfaces brief (SDH Mode, PPP) on page 369</p> <p>show interfaces detail (SDH Mode, PPP) on page 369</p> <p>show interfaces extensive (SDH Mode, PPP) on page 370</p> <p>show interfaces brief (SONET Mode, Frame Relay) on page 372</p> <p>show interfaces (SONET Mode, Frame Relay) on page 372</p> <p>show interfaces detail (SONET Mode, Frame Relay) on page 373</p> <p>show interfaces extensive (SONET Mode, Frame Relay) on page 375</p> <p>show interfaces extensive (OC768-over-4xOC192 Mode) on page 377</p> <p>show interfaces detail (IPv6 Tracking) on page 380</p> <p>show interfaces (shared interface) on page 381</p> |
| Output Fields | Table 77 on page 355 lists the output fields for the show interfaces (SONET/SDH) command. Output fields are listed in the approximate order in which they appear. |

Table 77: SONET/SDH show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---------------------------------|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |

Table 77: SONET/SDH show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | SONET/SDH reference clock source: Internal or External . Clocking is configured and displayed only for channel 0. | All levels |
| Framing mode | Framing mode: SONET or SDH . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Payload scrambler | Whether payload scrambling is enabled. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Shared-interface | Indicates whether the routing domain is the owner or non-owner of the shared interface. If the routing domain is the Root System Domain (RSD), the value is Owner . If the routing domain is a Protected System Domain (PSD) under the RSD, the value is Non-owner . | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| ANSI or ITU LMI settings | (Frame Relay) Settings for Local Management Interface (LMI). The format is (ANSI or ITU) LMI settings: <i>value</i> , <i>value</i> ... <i>xx</i> seconds, where <i>value</i> can be: <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1-255) ■ n392dce—DCE error threshold (1-10) ■ n392dte—DTE error threshold (1-10) ■ n393dce—DCE monitored event count (1-10) ■ n393dte—DTE monitored event count (1-10) ■ t391dte—DTE polling timer (5-30 seconds) ■ t392dce—DCE polling verification timer (5-30 seconds) | All levels |
| LMI | Input: <i>value</i> (<i>hh:mm:ss</i> ago), Output: <i>value</i> (<i>hh:mm:ss</i> ago) | brief none |

Table 77: SONET/SDH show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| LMI statistics | (Frame Relay) LMI packet statistics: <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: nn (last seen <i>hh:mm:ss</i> ago). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: nn (last sent <i>hh:mm:ss</i> ago). | detail extensive |
| DTE statistics | (Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data circuit-terminating equipment (DCE): <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |
| DCE statistics | (Frame Relay) Statistics about messages transmitted from the DCE to the DTE: <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |
| Common statistics | (Frame Relay) Statistics about messages sent between the DTE and the DCE: <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no LMI packet was reported for n392dte or n393dce intervals. (See LMI settings.) | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay. Displayed only from the DTE) Number of DLCIs configured from the DCE. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------------------|---|-----------------------|
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval <i>seconds</i>—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count <i>number</i>—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count <i>number</i>—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | All levels |
| Keepalive or Keepalive statistics | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. | All levels |
| LCP state | (PPP) Link Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | (PPP) Network Control Protocol state. <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---|--|-----------------------|
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | detail extensive none |
| CoS queues | Number of CoS queues configured. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour: minute: second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number of bytes and packets received and transmitted on the physical interface, and the traffic rate in bits per seconds (bps).</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Label-switched interface (LSI) traffic statistics | <p>(Frame Relay) LSI traffic statistics:</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes and speed, in bits per second (bps), received on the interface. ■ Output packets—Number of packets and speed, in bps, transmitted on the interface. | extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------|--|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Bucket Drops—Drops resulting from the traffic load exceeding the interface transmit/receive leaky bucket configuration. The default is off. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ HS link FIFO overflows—Number of FIFO overflows on the high-speed links between the ASICs responsible for handling the router interfaces. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ HS link FIFO underflows—Number of FIFO underflows on the high-speed links between the ASICs responsible for handling the router interfaces. ■ MTU errors—Number of packets whose size exceeds the MTU of the interface. | extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------------|---|------------------|
| IPv6 transit statistics | <p>Number of transit bytes and packets received and transmitted on the physical interface if IPv6 statistics tracking is enabled.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | extensive |
| SONET alarms SONET defects | (SONET) SONET media-specific alarms and defects that prevents the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SONET PHY, SONET section, SONET line, and SONET path. | All levels |
| Link | (For 4-port OC192c PIC operating in OC768-over-4xOC192 mode) The link number. Errors and alarms are displayed for each link. | extensive |
| SONET PHY | <p>Counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------|---|-----------------|
| SONET section | <p>Counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B1—Bit interleaved parity for SONET section overhead ■ SEF—Severely errored framing ■ LOL—Loss of light ■ LOF—Loss of frame ■ ES-S—Errored seconds (section) ■ SES-S—Severely errored seconds (section) ■ SEFS-S—Severely errored framing seconds (section) | extensive |
| SONET line | <p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B2—Bit interleaved parity for SONET line overhead ■ REI-L—Remote error indication (near-end line) ■ RDI-L—Remote defect indication (near-end line) ■ AIS-L—Alarm indication signal (near-end line) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ ES-L—Errored seconds (near-end line) ■ SES-L—Severely errored seconds (near-end line) ■ UAS-L—Unavailable seconds (near-end line) ■ ES-LFE—Errored seconds (far-end line) ■ SES-LFE—Severely errored seconds (far-end line) ■ UAS-LFE—Unavailable seconds (far-end line) | extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|----------------------------|--|-----------------|
| SONET path | <p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B3—Bit interleaved parity for SONET section overhead ■ REI-P—Remote error indication ■ LOP-P—Loss of pointer (path) ■ AIS-P—Path alarm indication signal ■ RDI-P—Path remote defect indication ■ UNEQ-P—Path unequipped ■ PLMP—Path payload label mismatch ■ ES-P—Errored seconds (near-end STS path) ■ SES-P—Severely errored seconds (near-end STS path) ■ UAS-P—Unavailable seconds (near-end STS path) ■ ES-PFE—Errored seconds (far-end STS path) ■ SES-PFE—Severely errored seconds (far-end STS path) ■ UAS-PFE—Unavailable seconds (far-end STS path) | extensive |
| Received SONET overhead | <p>Values of the received and transmitted SONET overhead:</p> <ul style="list-style-type: none"> ■ C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. | extensive |
| Transmitted SONET overhead | <ul style="list-style-type: none"> ■ F1—Section user channel byte. This byte is set aside for the purposes of users. ■ K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. ■ J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. ■ S1—Synchronization status. The S1 byte is located in the first STS-1 of an STS-N. ■ Z3 and Z4—Allocated for future use. | |
| SDH alarms | <p>SDH media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SDH PHY, SDH regenerator section, SDH multiplex section, and SDH path.</p> | All levels |
| SDH defects | | |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------|
| SDH PHY | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |
| SDH regenerator section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ RS-BIP8—24-bit BIP for multiplex section overhead (B2 bytes) ■ OOF—Out of frame ■ LOS—Loss of signal ■ LOF—Loss of frame ■ RS-ES—Errored seconds (near-end regenerator section) ■ RS-SES—Severely errored seconds (near-end regenerator section) ■ RS-SEFS—Severely errored framing seconds (regenerator section) | extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-----------------------|---|-----------------|
| SDH multiplex section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ MS-BIP24—8-bit BIP for high-order path overhead (B3 byte) ■ MS-FEBE—Far-end block error (multiplex section) ■ MS-FERF—Far-end remote fail (multiplex section) ■ MS-AIS—Alarm indication signal (multiplex section) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ MS-ES—Errored seconds (near-end multiplex section) ■ MS-SES—Severely errored seconds (near-end multiplex section) ■ MS-UAS—Unavailable seconds (near-end multiplex section) ■ MS-ES-FE—Errored seconds (far-end multiplex section) ■ MS-SES-FE—Severely errored seconds (far-end multiplex section) ■ MS-UAS-FE—Unavailable seconds (far-end multiplex section) | extensive |
| SDH path | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ HP-BIP8—8-bit BIP for regenerator section overhead (B1 byte) ■ HP-FEBE—Far-end block error (high-order path) ■ HP-LOP—Loss of pointer (high-order path) ■ HP-AIS—High-order-path alarm indication signal ■ HP-FERF—Far-end remote fail (high-order path) ■ HP-UNEQ—Unequipped (high-order path) ■ HP-PLM—Payload label mismatch (high-order path) ■ HP-ES—Errored seconds (near-end high-order path) ■ HP-SES—Severely errored seconds (near-end high-order path) ■ HP-UAS—Unavailable seconds (near-end high-order path) ■ HP-ES-FE—Errored seconds (far-end high-order path) ■ HP-SES-FE—Severely errored seconds (far-end high-order path) ■ HP-UAS-FE—Unavailable seconds (far-end high-order path) | extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--|---|-----------------|
| Received SDH overhead | Values of the received and transmitted SONET overhead: | extensive |
| Transmitted SDH overhead | <ul style="list-style-type: none"> ■ C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. ■ F1—Section user channel byte. This byte is set aside for the purposes of users. ■ K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. ■ J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. ■ S1—Synchronization status. The S1 byte is located in the first STS-1 of an STS-N. ■ Z3 and Z4—Allocated for future use. | |
| Received path trace | SONET/SDH interfaces allow path trace bytes to be sent inband across the SONET/SDH link. Juniper Networks and other router manufacturers use these bytes to help diagnose misconfigurations and network errors by setting the transmitted path trace message so that it contains the system hostname and name of the physical interface. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits. | extensive |
| Transmitted path trace | | |
| HDLC configuration | Information about the HDLC configuration. <ul style="list-style-type: none"> ■ Policing bucket—Configured state of the receiving policer. ■ Shaping bucket—Configured state of the transmitting shaper. ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. | extensive |
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—The queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. ■ <i>Bandwidth bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. ■ <i>Buffer usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ <i>Priority</i>—Queue priority. Possible values are <i>low</i> and <i>high</i>. ■ <i>Limit</i>—Displayed if rate limiting is configured for the queue. Possible values are <i>none</i> and <i>exact</i>. If <i>exact</i> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <i>none</i> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |

Table 77: SONET/SDH show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------------|--|-----------------------|
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| PPP parameters | The PPP loopback clear timer value. | extensive |
| Shared interface | Provides the following information: <ul style="list-style-type: none"> ■ shared with—(RSD only) Indicates which PSD owns the logical shared interface. For example, <code>psd3</code>. ■ peer interface—(PSD only) Lists the logical tunnel interface that peers with the logical shared interface. For example, <code>ut-2/1/0.2</code>. ■ tunnel token—Specifies the receive (RX) and transmit (TX) tunnel tokens. For example, Rx: 5.519, Tx: 13.514. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as <code>iso</code> , <code>inet6</code> , or <code>mpls</code> . | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <code>inet</code> , the IP address of the interface is also displayed. | brief |
| Multilink bundle | (If the logical interface is configured as part of a multilink bundle.) Interface name for the multilink bundle. | detail extensive none |
| AS bundle | (If the logical interface is configured as part of an aggregated SONET bundle.) AS bundle number. | detail extensive |

Table 77: SONET/SDH show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the interface. | detail extensive none |
| DLCI | (Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags , Total down time , Last down , and Traffic statistics . Flags is one or more of the following: <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when the link is active, but no information is received from the DCE. ■ Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ Dce-configured—Displayed when the command is issued from the DTE. | detail extensive |
| DLCI statistics | (Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

```

show interfaces      user@host> show interfaces so-0/0/0
(SDH Mode, PPP)    Physical interface: so-0/0/0, Enabled, Physical link is Up
                      Interface index: 149, SNMP ifIndex: 66
                      Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
                      Loopback: None, FCS: 16, Payload scrambler: Enabled
                      Device flags   : Present Running
                      Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                      Link flags     : Keepalives
                      Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
                      Keepalive: Input: 30 (00:00:07 ago), Output: 29 (00:00:05 ago)
                      LCP state: Opened
                      NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
                      Not-configured
                      CHAP state: Closed
                      CoS queues      : 4 supported, 4 maximum usable queues

```

```

Last flapped   : 2006-03-24 13:20:56 PST (00:05:09 ago)
Input rate    : 0 bps (0 pps)
Output rate   : 0 bps (0 pps)
SDH alarms    : None
SDH defects   : None

Logical interface so-0/0/0.0 (Index 66) (SNMP ifIndex 43)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  Protocol inet, MTU: 4470
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 10.0.12.0/30, Local: 10.0.12.1, Broadcast: 10.0.12.3
  Protocol iso, MTU: 4470
    Flags: Protocol-Down
  Protocol mpls, MTU: 4458
    Flags: Protocol-Down, Is-Primary

```

**show interfaces brief
(SDH Mode, PPP)**

```

user@host> show interfaces so-0/0/0 brief
Physical interface: so-0/0/0, Enabled, Physical link is Up
Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
Loopback: None, FCS: 16, Payload scrambler: Enabled
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive: Input: 25 (00:00:01 ago), Output: 24 (00:00:04 ago)
SDH alarms     : None
SDH defects    : None

Logical interface so-0/0/0.0
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  inet 10.0.12.1/30
  iso
  mpls

```

**show interfaces detail
(SDH Mode, PPP)**

```

user@host> show interfaces so-0/0/0 detail
Physical interface: so-0/0/0, Enabled, Physical link is Up
Interface index: 149, SNMP ifIndex: 66, Generation: 35
Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
Loopback: None, FCS: 16, Payload scrambler: Enabled
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 33 (last seen 00:00:05 ago)
  Output: 32 (last sent 00:00:06 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
CoS queues    : 4 supported, 4 maximum usable queues
Last flapped   : 2006-03-24 13:20:56 PST (00:05:38 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes   :           862           0 bps
  Output bytes  :          3592          64 bps
  Input packets:           70           0 pps
  Output packets:         330           0 pps
Egress queues: 4 supported, 4 in use

```

| Queue counters: | Queued packets | Transmitted packets | Dropped packets |
|-----------------|----------------|---------------------|-----------------|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 329 | 329 | 0 |

SDH alarms : None
SDH defects : None

Logical interface so-0/0/0.0 (Index 66) (SNMP ifIndex 43) (Generation 19)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Protocol inet, MTU: 4470, Generation: 48, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.0.12.0/30, Local: 10.0.12.1, Broadcast: 10.0.12.3,
Generation: 48
Protocol iso, MTU: 4470, Generation: 49, Route table: 0
Flags: Protocol-Down
Protocol mpls, MTU: 4458, Generation: 50, Route table: 0
Flags: Protocol-Down, Is-Primary

**show interfaces
extensive
(SDH Mode, PPP)**

```
user@host> show interfaces so-0/0/0 extensive
Physical interface: so-0/0/0, Enabled, Physical link is Up
Interface index: 149, SNMP ifIndex: 66, Generation: 35
Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
Loopback: None, FCS: 16, Payload scrambler: Enabled
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags : Keepalives
Hold-times : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 36 (last seen 00:00:01 ago)
  Output: 35 (last sent 00:00:10 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
CoS queues : 4 supported, 4 maximum usable queues
Last flapped : 2006-03-24 13:20:56 PST (00:06:08 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes : 922 0 bps
  Output bytes : 3850 64 bps
  Input packets: 75 0 pps
  Output packets: 356 0 pps
Label-switched interface (LSI) traffic statistics:
  Input bytes : 0 0 bps
  Input packets: 0 0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Bucket drops: 0, Policed discards: 218, L3 incompletes: 0,
  L2 channel errors: 0, L2 mismatch timeouts: 2, HS link CRC errors: 0,
  HS link FIFO overflows: 0
Output errors:
  Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0,
  HS link FIFO underflows: 0, MTU errors: 0
```

Egress queues: 4 supported, 4 in use

| Queue counters: | Queued packets | Transmitted packets | Dropped packets |
|-----------------|----------------|---------------------|-----------------|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 354 | 354 | 0 |

SDH alarms : None

SDH defects : None

| SDH PHY: | Seconds | Count | State |
|-----------|---------|-------|-------|
| PLL Lock | 0 | 0 | OK |
| PHY Light | 2 | 1 | OK |

SDH regenerator section:

| | | | |
|---------|---|---|----|
| RS-BIP8 | 0 | 0 | |
| OOF | 3 | 8 | OK |
| LOS | 3 | 2 | OK |
| LOF | 3 | 2 | OK |
| RS-ES | 3 | | |
| RS-SES | 3 | | |
| RS-SEFS | 3 | | |

SDH multiplex section:

| | | | |
|-----------|---|---|----|
| MS-BIP24 | 0 | 0 | |
| MS-FEBE | 0 | 0 | |
| MS-FERF | 3 | 2 | OK |
| MS-AIS | 2 | 1 | OK |
| BERR-SF | 0 | 0 | OK |
| BERR-SD | 0 | 0 | OK |
| MS-ES | 3 | | |
| MS-SES | 3 | | |
| MS-UAS | 0 | | |
| MS-SES-FE | 3 | | |
| MS-UAS-FE | 0 | | |

SDH path:

| | | | |
|-----------|---|---|----|
| HP-BIP8 | 0 | 0 | |
| HP-FEBE | 0 | 0 | |
| HP-LOP | 1 | 1 | OK |
| HP-AIS | 2 | 1 | OK |
| HP-FERF | 3 | 2 | OK |
| HP-UNEQ | 0 | 0 | OK |
| HP-PLM | 1 | 1 | OK |
| HP-ES | 3 | | |
| HP-SES | 3 | | |
| HP-UAS | 0 | | |
| HP-ES-FE | 3 | | |
| HP-SES-FE | 3 | | |
| HP-UAS-FE | 0 | | |

Received SDH overhead:

| | | | | |
|----|------------|-----------------|------------|--------|
| F1 | : 0x00, J0 | : 0x00, K1 | : 0x00, K2 | : 0x00 |
| S1 | : 0x00, C2 | : 0xcf, C2(cmp) | : 0xcf, F2 | : 0x00 |
| Z3 | : 0x00, Z4 | : 0x00, S1(cmp) | : 0x00 | |

Transmitted SDH overhead:

| | | | | |
|----|------------|------------|------------|--------|
| F1 | : 0x00, J0 | : 0x01, K1 | : 0x00, K2 | : 0x00 |
| S1 | : 0x00, C2 | : 0xcf, F2 | : 0x00, Z3 | : 0x00 |
| Z4 | : 0x00 | | | |

Received path trace: R2 so-0/0/0

52 32 20 73 6f 2d 30 2f 30 00 00 00 00 00 R2 so-0/0/0.....

Transmitted path trace: R1 so-0/0/0

```

52 31 20 73 6f 2d 30 2f 30 2f 30 00 00 00 00 00 R1 so-0/0/0.....
HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 4484, Runt threshold: 3
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 1 (0x00)
  CoS transmit queue   Bandwidth   Buffer Priority  Limit
                       %           bps    %    usec
0 best-effort         95  147744000  95     0      low  none
3 network-control     5    7776000   5     0      low  none

Logical interface so-0/0/0.0 (Index 66) (SNMP ifIndex 43) (Generation 19)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
PPP parameters:
  PPP loopback clear timer: 3 sec
Protocol inet, MTU: 4470, Generation: 48, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.12.0/30, Local: 10.0.12.1, Broadcast: 10.0.12.3,
  Generation: 48
Protocol iso, MTU: 4470, Generation: 49, Route table: 0
Flags: Protocol-Down
Protocol mpls, MTU: 4458, Generation: 50, Route table: 0
Flags: Protocol-Down, Is-Primary
MS-ES-FE                               3

```

**show interfaces brief
(SONET Mode,
Frame Relay)**

```

user@host> show interfaces so-0/0/0 brief
Physical interface: so-0/0/0, Enabled, Physical link is Up
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, FCS: 16, Payload scrambler: Enabled
Device flags   : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 29 (00:00:02 ago), Output: 28 (00:00:01 ago)
SONET alarms   : None
SONET defects  : None

Logical interface so-0/0/0.0
Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
inet 10.0.12.1 --> 10.0.12.2
iso
mpls
DLCI 16
Flags: Down, DCE-Unconfigured
Total down time: 00:04:12 sec, Last down: 00:04:12 ago

```

**show interfaces
(SONET Mode,
Frame Relay)**

```

user@host> show interfaces so-0/0/0
Physical interface: so-0/0/0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 66
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, FCS: 16, Payload scrambler: Enabled
Device flags   : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 23 (00:00:05 ago), Output: 22 (00:00:03 ago)
DTE statistics:
  Enquiries sent           : 19
  Full enquiries sent      : 3

```



```

    Enquiry responses received      : 20
    Full enquiry responses received : 3
DCE statistics:
    Enquiries received             : 0
    Full enquiries received        : 0
    Enquiry responses sent         : 0
    Full enquiry responses sent    : 0
Common statistics:
    Unknown messages received      : 0
    Asynchronous updates received  : 0
    Out-of-sequence packets received : 0
    Keepalive responses timeout    : 1
CoS queues      : 4 supported, 4 maximum usable queues
Last flapped   : 2006-03-06 11:53:20 PST (3d 03:09 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 56 bps (0 pps)
SONET alarms   : None
SONET defects  : None

Logical interface so-0/0/0.0 (Index 79) (SNMP ifIndex 43)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 4470
    Flags: None
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
      Destination: 10.0.12.2, Local: 10.0.12.1
  Protocol iso, MTU: 4470
    Flags: None
  Protocol mpls, MTU: 4450
  DLCI 16
    Flags: Down, DCE-Unconfigured
    Total down time: 00:03:11 sec, Last down: 00:03:11 ago
    Input packets : 0
    Output packets: 0
DLCI statistics:
  Active DLCI :0 Inactive DLCI :1

```

**show interfaces detail
(SONET Mode,
Frame Relay)**

```

user@host> show interfaces so-0/0/0 detail
Physical interface: so-0/0/0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 66, Generation: 11
  Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, SONET mode,
  Speed: OC3, Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives DTE
  Hold-times     : Up 0 ms, Down 0 ms
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI statistics:
    Input : 33 (last seen 00:00:09 ago)
    Output: 32 (last sent 00:00:01 ago)
  DTE statistics:
    Enquiries sent             : 27
    Full enquiries sent        : 5
    Enquiry responses received : 28
    Full enquiry responses received : 5
  DCE statistics:
    Enquiries received             : 0
    Full enquiries received        : 0
    Enquiry responses sent         : 0
    Full enquiry responses sent    : 0

```

```

Common statistics:
  Unknown messages received      : 0
  Asynchronous updates received  : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout    : 1
CoS queues      : 4 supported, 4 maximum usable queues
Last flapped    : 2006-03-06 11:53:20 PST (3d 03:10 ago)
Statistics last cleared: Never
Traffic statistics:
  Input  bytes :          495368          0 bps
  Output bytes :        2765014         56 bps
  Input  packets:          41165          0 pps
  Output packets:        133530         0 pps
Egress queues: 4 supported, 4 in use
Queue counters:
  Queued packets  Transmitted packets  Dropped packets

  0 best-effort          18              18              0
  1 expedited-fo          0              0              0
  2 assured-forw          0              0              0
  3 network-cont    133506          133506              0

SONET alarms   : None
SONET defects  : None
Logical interface so-0/0/0.0 (Index 79) (SNMP ifIndex 43) (Generation 28)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
  Traffic statistics:
    Input bytes :          0
    Output bytes :          0
    Input packets:          0
    Output packets:          0
  Local statistics:
    Input bytes :          0
    Output bytes :          0
    Input packets:          0
    Output packets:          0
  Transit statistics:
    Input bytes :          0          0 bps
    Output bytes :          0          0 bps
    Input packets:          0          0 pps
    Output packets:          0          0 pps
  Protocol inet, MTU: 4470, Generation: 49, Route table: 0
    Flags: None
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
      Destination: 10.0.12.2, Local: 10.0.12.1, Broadcast: Unspecified,
      Generation: 61
  Protocol iso, MTU: 4470, Generation: 50, Route table: 0
    Flags: None
  Protocol mpls, MTU: 4450, Generation: 51, Route table: 0
  DLCI 16
    Flags: Down, DCE-Unconfigured
    Total down time: 00:04:54 sec, Last down: 00:04:54 ago
    Traffic statistics:
      Input bytes :          0
      Output bytes :          0
      Input packets:          0
      Output packets:          0
  DLCI statistics:
    Active DLCI :0 Inactive DLCI :1

```

**show interfaces
extensive (SONET Mode,
Frame Relay)**

```

user@host> show interfaces so-0/0/0 extensive
Physical interface: so-0/0/0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 66, Generation: 11
  Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, SONET mode,
  Speed: OC3, Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives DTE
  Hold-times     : Up 0 ms, Down 0 ms
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI statistics:
    Input : 39 (last seen 00:00:02 ago)
    Output: 36 (last sent 00:00:07 ago)
  DTE statistics:
    Enquiries sent           : 30
    Full enquiries sent      : 6
    Enquiry responses received : 33
    Full enquiry responses received : 6
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received  : 0
    Enquiry responses sent   : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 1
  CoS queues : 4 supported, 4 maximum usable queues
  Last flapped : 2006-03-06 11:53:20 PST (3d 03:11 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 495452 56 bps
    Output bytes : 2765074 0 bps
    Input packets: 41171 0 pps
    Output packets: 133534 0 pps
  Label-switched interface (LSI) traffic statistics:
    Input bytes : 0 0 bps
    Input packets: 0 0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Bucket drops: 0, Policed discards: 0, L3 incompletes: 0,
    L2 channel errors: 0, L2 mismatch timeouts: 0, HS link CRC errors: 0,
    HS link FIFO overflows: 0
  Output errors:
    Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0,
    HS link FIFO underflows: 0, MTU errors: 0
  Egress queues: 4 supported, 4 in use
  Queue counters:

```

| | Queued packets | Transmitted packets | Dropped packets |
|----------------|----------------|---------------------|-----------------|
| 0 best-effort | 18 | 18 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 133510 | 133510 | 0 |

```

  SONET alarms : None
  SONET defects : None
  SONET PHY:
    Seconds      Count  State

```

```

    PLL Lock                0                0 OK
    PHY Light                60                1 OK
SONET section:
    BIP-B1                   0                0
    SEF                      108             158 OK
    LOS                      108             2 OK
    LOF                      108             2 OK
    ES-S                     108
    SES-S                     108
    SEFS-S                    108
SONET line:
    BIP-B2                   0                0
    REI-L                    0                0
    RDI-L                    1                1 OK
    AIS-L                    107             1 OK
    BERR-SF                   0                0 OK
    BERR-SD                   44             2 OK
    ES-L                     108
    SES-L                     108
    UAS-L                     97
    ES-LFE                    1
    SES-LFE                    1
    UAS-LFE                    0
SONET path:
    BIP-B3                   0                0
    REI-P                     0                0
    LOP-P                     1                1 OK
    AIS-P                     107             1 OK
    RDI-P                     1                1 OK
    UNEQ-P                    0                0 OK
    PLM-P                     1                1 OK
    ES-P                      108
    SES-P                      108
    UAS-P                      97
    ES-PFE                     1
    SES-PFE                     1
    UAS-PFE                     0
Received SONET overhead:
    F1      : 0x00, J0      : 0x00, K1      : 0x00, K2      : 0x00
    S1      : 0x00, C2      : 0xcf, C2(cmp) : 0xcf, F2      : 0x00
    Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00
Transmitted SONET overhead:
    F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
    S1      : 0x00, C2      : 0xcf, F2      : 0x00, Z3      : 0x00
    Z4      : 0x00
Received path trace: R2 so-0/0/0
    52 32 20 73 6f 2d 30 2f 30 2f 30 00 00 00 00 00 R2 so-0/0/0.....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 0d 0a .....
Transmitted path trace: R1 so-0/0/0
    52 31 20 73 6f 2d 30 2f 30 2f 30 00 00 00 00 00 R1 so-0/0/0.....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
HDLC configuration:
    Policing bucket: Disabled
    Shaping bucket : Disabled
    Giant threshold: 4484, Runt threshold: 3
Packet Forwarding Engine configuration:
    Destination slot: 0, PLP byte: 1 (0x00)

```

| CoS transmit queue | Bandwidth | | Buffer | Priority | Limit |
|--------------------|-----------|-----------|--------|----------|----------|
| | % | bps | | | |
| 0 best-effort | 95 | 147744000 | 95 | 0 | low none |
| 3 network-control | 5 | 7776000 | 5 | 0 | low none |

Logical interface so-0/0/0.0 (Index 79) (SNMP ifIndex 43) (Generation 28)

Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID

Traffic statistics:

Input bytes : 0
 Output bytes : 0
 Input packets: 0
 Output packets: 0

Local statistics:

Input bytes : 0
 Output bytes : 0
 Input packets: 0
 Output packets: 0

Transit statistics:

Input bytes : 0 0 bps
 Output bytes : 0 0 bps
 Input packets: 0 0 pps
 Output packets: 0 0 pps

Protocol inet, MTU: 4470, Generation: 49, Route table: 0

Flags: None

Addresses, Flags: Dest-route-down Is-Preferred Is-Primary

Destination: 10.0.12.2, Local: 10.0.12.1, Broadcast: Unspecified,
 Generation: 61

Protocol iso, MTU: 4470, Generation: 50, Route table: 0

Flags: None

Protocol mpls, MTU: 4450, Generation: 51, Route table: 0

DLCI 16

Flags: Down, DCE-Unconfigured

Total down time: 00:05:42 sec, Last down: 00:05:42 ago

Traffic statistics:

Input bytes : 0
 Output bytes : 0
 Input packets: 0
 Output packets: 0

DLCI statistics:

Active DLCI :0 Inactive DLCI :1

**show interfaces
 extensive
 (OC768-over-4xOC192
 Mode)**

user@host> **show interfaces so-7/0/0 extensive**

Physical interface: so-7/0/0, Enabled, Physical link is Up

Interface index: 163, SNMP ifIndex: 23, Generation: 186

Link-level type: Cisco-HDLC, MTU: 4474, Clocking: Internal, SONET mode, Speed:
 OC768,

Loopback: Local, FCS: 16, Payload scrambler: Enabled

Device flags : Present Running

Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000

Link flags : No-Keepalives

Hold-times : Up 0 ms, Down 0 ms

CoS queues : 8 supported, 8 maximum usable queues

Last flapped : 2006-01-13 10:43:39 PST (01:05:33 ago)

Statistics last cleared: Never

Traffic statistics:

Input bytes : 76992 200 bps
 Output bytes : 83707 216 bps
 Input packets: 1343 0 pps
 Output packets: 1343 0 pps

Input errors:

Errors: 0, Drops: 3885, Framing errors: 68154624, Runts: 0, Giants: 0, Bucket

```

drops: 0,
  Policed discards: 0, L3 incompletes: 95040248, L2 channel errors: 0, L2
mismatch timeouts: 0,
  HS link CRC errors: 0, HS link FIFO overflows: 30742070
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, HS link FIFO
underflows: 0,
  MTU errors: 0
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort              2              2              0

  1 expedited-fo             0              0              0

  2 assured-forw             0              0              0

  3 network-cont            1341            1341            0

SONET alarms   : None
SONET defects  : None
Link : 0
SONET alarms   : None
SONET defects  : None
SONET PHY:
  Seconds      Count  State
  PLL Lock     0      0  OK
  PHY Light    0      0  OK
SONET section:
  BIP-B1       0      0
  SEF          2      1  OK
  LOS          0      0  OK
  LOF          3      2  OK
  ES-S         2
  SES-S        2
  SEFS-S       2
SONET line:
  BIP-B2       0      0
  REI-L        0      0
  RDI-L        1      1  OK
  AIS-L        2      1  OK
  BERR-SF      0      0  OK
  BERR-SD      0      0  OK
  ES-L         3
  SES-L        3
  UAS-L        0
  ES-LFE       1
  SES-LFE      1
  UAS-LFE      0
SONET path:
  BIP-B3       0      0
  REI-P        0      0
  LOP-P        0      0  OK
  AIS-P        2      1  OK
  RDI-P        0      0  OK
  UNEQ-P       0      0  OK
  PLM-P        0      0  OK
  ES-P         3
  SES-P        3
  UAS-P        0
  ES-PFE       0
  SES-PFE      0

```

```

UAS-PFE                                0
Payload pointer:
  Current pointer                       : 522
  Pointer increment count               : 0
  Pointer decrement count               : 0
  New pointer NDF count                 : 0
Received SONET overhead:
  F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0xcf, C2(cmp) : 0xcf, F2      : 0x00
  Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00
Transmitted SONET overhead:
  F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0xcf, F2      : 0x00, Z3      : 0x00
  Z4      : 0x00
Received path trace: fold so-7/0/0
  66 6f 6c 64 20 73 6f 2d 37 2f 30 2f 30 00 00 00  fold so-7/0/0...
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 0d 0a .....
Transmitted path trace: fold so-7/0/0
  66 6f 6c 64 20 73 6f 2d 37 2f 30 2f 30 00 00 00  fold so-7/0/0...
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Link : 1
SONET alarms   : None
SONET defects  : None
SONET PHY:
  Seconds      Count  State
  PLL Lock     0       0 OK
  PHY Light    0       0 OK
SONET section:
  BIP-B1       0       0
  SEF          2       1 OK
  LOS          0       0 OK
  LOF          3       2 OK
  ES-S         2
  SES-S        2
  SEFS-S       2
SONET line:
  BIP-B2       0       0
  REI-L        0       0
  RDI-L        0       0 OK
  AIS-L        2       1 OK
  BERR-SF      0       0 OK
  BERR-SD      0       0 OK
  ES-L         3
  SES-L        3
  UAS-L        0
  ES-LFE       0
  SES-LFE      0
  UAS-LFE      0
SONET path:
  BIP-B3       0       0
  REI-P        0       0
  LOP-P        0       0 OK
  AIS-P        2       1 OK
  RDI-P        0       0 OK
  UNEQ-P       0       0 OK
  PLM-P        0       0 OK
  ES-P         3
  SES-P        3

```

```

UAS-P                0
ES-PFE               0
SES-PFE              0
UAS-PFE              0
Payload pointer:
  Current pointer      : 522
  Pointer increment count : 0
  Pointer decrement count : 0
  New pointer NDF count  : 0
Received SONET overhead:
  F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0xcf, C2(cmp) : 0xcf, F2      : 0x00
  Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00
Transmitted SONET overhead:
  F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0xcf, F2      : 0x00, Z3      : 0x00
  Z4      : 0x00
Received path trace: fold so-7/0/0
66 6f 6c 64 20 73 6f 2d 37 2f 30 00 00 00  fold so-7/0/0...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 0d 0a .....
Transmitted path trace: fold so-7/0/0
66 6f 6c 64 20 73 6f 2d 37 2f 30 00 00 00  fold so-7/0/0...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
...

```

show interfaces detail (IPv6 Tracking)

```

user@host> show interfaces so-0/2/0 detail
Physical interface: so-0/2/0, Enabled, Physical link is Up
  Interface index: 130, SNMP ifIndex: 26, Generation: 131
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode,
Speed: OC3,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Hold-times     : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 7 (last seen 00:00:01 ago)
    Output: 6 (last sent 00:00:08 ago)
  LCP state: Opened
  NCP state: inet: Not-configured, inet6: Opened, iso: Not- configured, mpls:
Not-configured
  CHAP state: Closed
  PAP state: Closed
  CoS queues   : 4 supported, 4 maximum usable queues
  Last flapped : 2007-11-29 08:45:47 PST (1d 03:44 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :          7407782          40 bps
    Output bytes :         7307322          48 bps
    Input packets:         107570           0 pps
    Output packets:        108893           0 pps
  IPv6 transit statistics:
    Input bytes :          57328
    Output bytes :          57400
    Input packets:           1024
    Output packets:          1025

```



```

Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets  Dropped packets
  0 best-effort      1191              1191                 0
  1 expedited-fo     0                  0                    0
  2 assured-forw     0                  0                    0
  3 network-cont     107700             107700               0
SONET alarms   : None
SONET defects  : None

```

```

Logical interface so-0/2/0.0 (Index 70) (SNMP ifIndex 47) (Generation 231)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Protocol inet6, MTU: 4470, Generation: 433, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: abcd::a18:104/126, Local: abcd::a18:105,
  Broadcast: Unspecified, Generation: 683
Addresses, Flags: Is-Preferred
  Destination: fe80::/64, Local: fe80::2a0:a5ff:fe56:52a,
  Broadcast: Unspecified, Generation: 684

```

show interfaces (shared interface)

```

user@rsd1> show interfaces so-7/2/0
Physical interface: so-7/2/0, Enabled, Physical link is Down
Interface index: 128, SNMP ifIndex: 109
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, SONET mode,
Speed: OC192, Loopback: None, FCS: 16, Payload scrambler: Enabled
Device flags   : Present Running Down
Interface flags: Hardware-Down Point-To-Point SNMP-Traps Internal: 0x4000
Shared-interface : Owner
Link flags     : No-Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 0 (never), Output: 0 (never)
DTE statistics:
  Enquiries sent           : 0
  Full enquiries sent      : 0
  Enquiry responses received : 0
  Full enquiry responses received : 0
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 0
CoS queues   : 8 supported, 8 maximum usable queues
Last flapped : 2008-08-11 10:51:51 PDT (1w1d 04:47 ago)
Input rate   : 0 bps (0 pps)
Output rate  : 0 bps (0 pps)
SONET alarms : LOL, PLL
SONET defects : LOL, PLL, LOF, SEF, AIS-L, AIS-P

Logical interface so-7/2/0.0 (Index 67) (SNMP ifIndex 117)
Flags: Device-Down Point-To-Point SNMP-Traps 0x4000 Encapsulation: FR-NLPID
Shared interface:
  Shared with: psd5
  Tunnel token: Rx: 2.517, Tx: 1.517
Input packets : 0
Output packets: 0
DLCI 700

```

```
Flags: Active
Total down time: 00:01:09 sec, Last down: 284:58:21 ago
  Input packets : 0
  Output packets: 0
DLCI statistics:
  Active DLCI   :1  Inactive DLCI  :0
```

show interfaces diagnostics optics (SONET)


| | |
|---|--|
| Syntax | show interfaces diagnostics optics <i>so-fpc/pic/port</i> |
| Release Information | Command introduced in JUNOS Release 7.5. |
| Description | (T-series routers only) On OC768 SONET interfaces, display 300-pin Multisource Agreement (MSA) diagnostics data and alarms. For OC192 and OC768 interfaces on the 4-port OC-192c PIC, display XFP diagnostics and data alarms. |
| Options | <i>so-fpc/pic/port</i> —SONET/SDH interface name. |
| Additional Information | <p>300-pin Multisource Agreement (MSA) optics, XENPAK MSA optics, and XFP optics are supported. The 300-pin MSA tool kit polls the PIC and the XENPAK driver polls the XENPAK transceiver in 1-second intervals for diagnostics data, alarms, and warnings and stores them into memory. The alarms will not cause the links to go down or the LEDs to change color or generate SNMP traps. Changes in alarm and warning status will generate system log messages.</p> <p>Thresholds that trigger a high alarm, low alarm, high warning, or low warning are set by the transponder vendors. Generally, a high alarm or low alarm indicates that the optics module is not operating properly. This information can be used to diagnose why a PIC is not working.</p> |
|  | <p>NOTE: The show interfaces diagnostics optics command for optical interfaces does not report the decibel (dBm) value of the received signal if the received power is zero milliwatts (0.0000 mW).</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces diagnostics optics (300-Pin MSA Optics) on page 391</p> <p>show interfaces diagnostics optics (Next-Generation SONET/SDH SFP Optics) on page 392</p> <p>show interfaces diagnostics optics (XENPAK MSA Optics) on page 392</p> <p>show interfaces diagnostics optics (XFP Optics) on page 393</p> |
| Output Fields | Table 78 on page 383 lists the output fields for the show interfaces diagnostics optics command when the router is operating with MSA optics. Output fields are listed in the approximate order in which they appear |

Table 78: 300-Pin MSA Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|--------------------|---|
| Physical interface | Name of the physical interface. |
| Laser bias current | Magnitude of the laser bias power setting current, in milliamperes. This indicator is a software equivalent to the LsBIASMON pin in hardware. |

Table 78: 300-Pin MSA Optics show interfaces diagnostics optics Output Fields (*continued*)

| Field Name | Field Description |
|--|--|
| Laser output power | Laser output power, in milliwatts (mW) and decibels, referenced to 1.0 mW (dBm). This is a software equivalent to the LsPOWMON pin in hardware. |
| Receiver signal average optical power | Average received optical power, in mW and dBm. This indicator is a software equivalent to the RxPOWMON pin in hardware. Average optical power is vendor-specific. For example: <ul style="list-style-type: none"> ■ Intel—Rx power monitor: +/- 1 dB ■ Opnext—Rx power monitor: +/- 1.5 dB |
| Laser end-of-life alarm | Laser end-of-life alarm: On or Off. |
| Laser wavelength alarm | Laser wavelength alarm: On or Off. |
| Laser bias current alarm | Laser bias current alarm: On or Off. |
| Laser temperature alarm | Laser temperature alarm: On or Off. |
| Laser power alarm | Laser power alarm: On or Off. |
| Modulator temperature alarm | (Opnext 300-pin MSA transponders only) Modulator temperature alarm: On or Off. |
| Modulator bias alarm | Modulator bias alarm: On or Off. |
| Tx multiplexer FIFO error alarm | Transmit multiplexer first in, first out (FIFO) error alarm: On or Off. |
| Tx loss of PLL lock alarm | Transmit loss of phase-locked loop (PLL) lock alarm: On or Off. |
| Rx loss of average optical power alarm | Receive loss of average optical power alarm: On or Off. |
| Rx loss of AC power alarm | (Opnext 300-pin MSA transponders only) Receive loss of AC power alarm: On or Off. |
| Rx loss of PLL lock alarm | Receive loss of phase-locked loop (PLL) lock alarm: On or Off. |

Table 79 on page 384 lists the output fields for the **show interfaces diagnostics optics** command when the router is operating with next-generation SONET/SDH SFP optics. Output fields are listed in the approximate order in which they appear.

Table 79: 10-Gigabit Ethernet Next-Generation SONET/SDH SFP Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|--------------------|---------------------------------|
| Physical interface | Name of the physical interface. |

Table 79: 10-Gigabit Ethernet Next-Generation SONET/SDH SFP Optics show interfaces diagnostics optics Output Fields (continued)

| Field Name | Field Description |
|---------------------------------------|---|
| Laser bias current | Magnitude of the laser bias power setting current, in milliamperes. The laser bias provides direct modulation of laser diodes and modulates currents. |
| Laser output power | Laser output power, in milliwatts (mW) and decibels, referenced to 1.0 mW (dBm). |
| Module temperature | Temperature of the XFP optics module, in Celsius and Fahrenheit. |
| Module voltage | Internally measured module voltage. |
| Receiver signal average optical power | Average received optical power, in mW and dBm. |
| Laser bias current high alarm | Laser bias power setting high alarm. Displays on or off. |
| Laser bias current low alarm | Laser bias power setting low alarm. Displays on or off. |
| Laser bias current high warning | Laser bias power setting high warning. Displays on or off. |
| Laser bias current low warning | Laser bias power setting low warning. Displays on or off. |
| Laser output power high alarm | Laser output power high alarm. Displays on or off. |
| Laser output power low alarm | Laser output power low alarm. Displays on or off. |
| Laser output power high warning | Laser output power high warning. Displays on or off. |
| Laser output power low warning | Laser output power low warning. Displays on or off. |
| Module temperature high alarm | Module temperature high alarm. Displays on or off. |
| Module temperature low alarm | Module temperature low alarm. Displays on or off. |
| Module temperature high warning | Module temperature high warning. Displays on or off. |
| Module temperature low warning | Module temperature low warning. Displays on or off. |
| Module voltage high alarm | Module voltage high alarm. Displays on or off. |
| Module voltage low alarm | Module voltage low alarm. Displays on or off. |

Table 79: 10-Gigabit Ethernet Next-Generation SONET/SDH SFP Optics show interfaces diagnostics optics Output Fields (*continued*)

| Field Name | Field Description |
|---|---|
| Module voltage high warning | Module voltage high warning . Displays on or off. |
| Module voltage low warning | Module voltage high warning . Displays on or off. |
| Laser rx power high alarm | Receive laser power high alarm. Displays on or off. |
| Laser rx power low alarm | Receive laser power low alarm. Displays on or off. |
| Laser rx power high warning | Receive laser power high warning. Displays on or off. |
| Laser rx power low warning | Receive laser power low warning. Displays on or off. |
| Laser bias current high alarm threshold | Vendor-specified threshold for the laser bias current high alarm: 80.000 mA. |
| Laser bias current low alarm threshold | Vendor-specified threshold for the laser bias current low alarm: 2.000 mA. |
| Laser bias current high warning threshold | Vendor-specified threshold for the laser bias current high warning: 70.000 mA. |
| Laser bias current low warning threshold | Vendor-specified threshold for the laser bias current low warning: 4.000 mA. |
| Laser output power high alarm threshold | Vendor-specified threshold for the laser output power high alarm: 1.2600 mW or 1.00 dBm. |
| Laser output power low alarm threshold | Vendor-specified threshold for the laser output power low alarm: 0.0440 mW or -13.57 dBm. |
| Laser output power high warning threshold | Vendor-specified threshold for the laser output power high warning: 0.7950 mW or -1.00 dBm. |
| Laser output power low warning threshold | Vendor-specified threshold for the laser output power low warning: 0.0700 mW or -11.55 dBm. |
| Module temperature high alarm threshold | Vendor-specified threshold for the module temperature high alarm: 110° C or 230° F. |
| Module temperature low alarm threshold | Vendor-specified threshold for the module temperature low alarm: -40° C or -40° F. |
| Module temperature high warning threshold | Vendor-specified threshold for the module temperature high warning: 93° C or 199° F. |
| Module temperature low warning threshold | Vendor-specified threshold for the module temperature low warning: -30° C or -22° F. |

Table 79: 10-Gigabit Ethernet Next-Generation SONET/SDH SFP Optics show interfaces diagnostics optics Output Fields (continued)

| Field Name | Field Description |
|---------------------------------------|---|
| Module voltage high alarm threshold | Module voltage high alarm threshold: 3.900 v. |
| Module voltage low alarm threshold | Module voltage low alarm threshold: 2.700 v. |
| Module voltage high warning threshold | Module voltage high warning threshold: 3.700 v. |
| Module voltage low warning threshold | Module voltage high warning threshold: 2.900 v. |
| Laser rx power high alarm threshold | Vendor-specified threshold for the laser Rx power high alarm: 1.1749 mW or 0.70 dBm. |
| Laser rx power low alarm threshold | Vendor-specified threshold for the laser Rx power low alarm: 0.0039 mW or -24.09 dBm. |
| Laser rx power high warning threshold | Vendor-specified threshold for the laser Rx power high warning: 0.7942 mW or 1.00 dBm. |
| Laser rx power low warning threshold | Vendor-specified threshold for the laser Rx power low warning: 0.0100 mW or -20.00 dBm. |

Table 80 on page 387 lists the output fields for the `show interfaces diagnostics optics` command generated from XENPAK MSA optics.

Table 80: XENPAK MSA Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|-------------------------------|---|
| Physical interface | Name of the physical interface. |
| Laser bias current | Measured laser bias current in uA. |
| Laser output power | Measured laser output power in mW. |
| Module temperature | Internally measured module temperature. |
| Laser rx power | Measured receive optical power in mW. |
| Laser bias current high alarm | Laser bias current high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current low alarm | Laser bias current low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser output power high alarm | Laser output power high alarm: On or Off. Alarm ranges are vendor-specific. |

Table 80: XENPAK MSA Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---------------------------------|--|
| Laser output power low alarm | Laser output power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp high alarm | Module temperature high alarm: On or Off. Alarm ranges are vendor-specific. |
| Module temp low alarm | Module temperature low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power high alarm | Laser receive power high alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser rx power low alarm | Laser receive power low alarm: On or Off. Alarm ranges are vendor-specific. |
| Laser bias current high warning | Laser bias current high warning: On or Off. Warning ranges are vendor-specific. |
| Laser bias current low warning | Laser bias current low warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power high warning | Laser output power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser output power low warning | Laser output power low warning: On or Off. Warning ranges are vendor-specific. |
| Module temp high warning | Module temperature high warning: On or Off. Warning ranges are vendor-specific. |
| Module temp low warning | Module temperature low warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power high warning | Laser receive power high warning: On or Off. Warning ranges are vendor-specific. |
| Laser rx power low warning | Laser receive power low warning: On or Off. Warning ranges are vendor-specific. |

Table 81 on page 388 lists the output fields for the **show interfaces diagnostics optics** command when the router is operating with XFP optics. Output fields are listed in the approximate order in which they appear.

Table 81: XFP Optics show interfaces diagnostics optics Output Fields

| Field Name | Field Description |
|--------------------|---|
| Physical interface | Name of the physical interface. |
| Link | (For 4-port OC-192c PIC is operating in OC768-over-4xOC192 mode) The link number. Diagnostics and alarms are displayed for each link. |

Table 81: XFP Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---------------------------------|---|
| Laser bias current | Magnitude of the laser bias power setting current, in milliamperes. The laser bias provides direct modulation of laser diodes and modulates currents. |
| Laser output power | Laser output power, in milliwatts (mW) and decibels, referenced to 1.0 mW (dBm). This is a software equivalent to the LsPOWMON pin in hardware. |
| Module temperature | Temperature of the XFP optics module, in Celsius and Fahrenheit. |
| Laser rx power | Laser received optical power, in mW and dBm. |
| Laser bias current high alarm | Laser bias power setting high alarm. Displays on or off. |
| Laser bias current low alarm | Laser bias power setting low alarm. Displays on or off. |
| Laser bias current high warning | Laser bias power setting high warning. Displays on or off. |
| Laser bias current low warning | Laser bias power setting low warning. Displays on or off. |
| Laser output power high alarm | Laser output power high alarm. Displays on or off. |
| Laser output power low alarm | Laser output power low alarm. Displays on or off. |
| Laser output power high warning | Laser output power high warning. Displays on or off. |
| Laser output power low warning | Laser output power low warning. Displays on or off. |
| Module temperature high alarm | Module temperature high alarm. Displays on or off. |
| Module temperature low alarm | Module temperature low alarm. Displays on or off. |
| Module temperature high warning | Module temperature high warning. Displays on or off. |
| Module temperature low warning | Module temperature low warning. Displays on or off. |
| Laser rx power high alarm | Receive laser power high alarm. Displays on or off. |
| Laser rx power low alarm | Receive laser power low alarm. Displays on or off. |
| Laser rx power high warning | Receive laser power high warning. Displays on or off. |

Table 81: XFP Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| Laser rx power low warning | Receive laser power low warning. Displays on or off . |
| Module not ready alarm | Module not ready alarm. When on , indicates the module has an operational fault. Displays on or off . |
| Module power down alarm | Module power down alarm. When on , module is in a limited power mode, low for normal operation. Displays on or off . |
| Tx data not ready alarm | Any condition leading to invalid data on the transmit path. Displays on or off . |
| Tx not ready alarm | Any condition leading to invalid data on the transmit path. Displays on or off . |
| Tx laser fault alarm | Laser fault condition. Displays on or off . |
| Tx CDR loss of lock alarm | Transmit clock and data recovery (CDR) loss of lock. Loss of lock on the transmit side of the CDR. Displays on or off . |
| Rx not ready alarm | Any condition leading to invalid data on the receive path. Displays on or off . |
| Rx loss of signal alarm | Receive Loss of Signal alarm. When on , indicates insufficient optical input power to the module. Displays on or off . |
| Rx CDR loss of lock alarm | Receive CDR loss of lock. Loss of lock on the receive side of the CDR. Displays on or off . |
| Laser bias current high alarm threshold | Vendor-specified threshold for the laser bias current high alarm: 130.000 mA . |
| Laser bias current low alarm threshold | Vendor-specified threshold for the laser bias current low alarm: 10.000 mA . |
| Laser bias current high warning threshold | Vendor-specified threshold for the laser bias current high warning: 120.000 mA . |
| Laser bias current low warning threshold | Vendor-specified threshold for the laser bias current low warning: 12.000 mA . |
| Laser output power high alarm threshold | Vendor-specified threshold for the laser output power high alarm: 0.8910 mW or -0.50 dBm . |
| Laser output power low alarm threshold | Vendor-specified threshold for the laser output power low alarm: 0.2230 mW or -6.52 dBm . |
| Laser output power high warning threshold | Vendor-specified threshold for the laser output power high warning: 0.7940 mW or -100 dBm . |
| Laser output power low warning threshold | Vendor-specified threshold for the laser output power low warning: 0.2510 mW or -600dBm . |
| Module temperature high alarm threshold | Vendor-specified threshold for the module temperature high alarm: 90 °C or 194 °F . |
| Module temperature low alarm threshold | Vendor-specified threshold for the module temperature low alarm: -5 °C or 23 °F . |

Table 81: XFP Optics show interfaces diagnostics optics Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| Module temperature high warning threshold | Vendor-specified threshold for the module temperature high warning: 85 °C or 185 °F. |
| Module temperature low warning threshold | Vendor-specified threshold for the module temperature low warning: 0 °C or 32 °F. |
| Laser rx power high alarm threshold | Vendor-specified threshold for the laser Rx power high alarm: 1.2589 mW or 1.00 dBm. |
| Laser rx power low alarm threshold | Vendor-specified threshold for the laser Rx power low alarm: 0.0323 mW or -14.91 dBm. |
| Laser rx power high warning threshold | Vendor-specified threshold for the laser Rx power high warning: 1.1220 mW or 0.50 dBm. |
| Laser rx power low warning threshold | Vendor-specified threshold for the laser Rx power low warning: 0.0363 mW or -14.40 dBm. |

**show interfaces
diagnostics optics
(300-Pin MSA Optics)**

```

user@host> show interfaces diagnostics optics so-4/0/0
Physical interface: so-4/0/0
Laser bias current           : 79.938 mA
Laser output power          : 1.592 mW / 2.02 dBm
Receiver signal average optical power : 1.3854 mW / 1.42 dBm
Laser end-of-life alarm      : Off
Laser wavelength alarm       : Off
Laser bias current alarm     : Off
Laser temperature alarm      : Off
Laser power alarm            : Off
Modulator temperature alarm   : Off
Modulator bias alarm         : Off
Tx multiplexer FIFO error alarm : Off
Tx loss of PLL lock alarm    : Off
Rx loss of average optical power alarm: Off
Rx loss of AC power alarm    : Off
Rx loss of PLL lock alarm    : Off

```

```

show interfaces      user@host> show interfaces diagnostics optics so-1/0/0
diagnostics optics  Physical interface: so-1/0/0
(Next-Generation    Laser bias current           : 24.008 mA
SONET/SDH SFP Optics) Laser output power          : 0.2620 mW / -5.82 dBm
                        Module temperature       : 62 degrees C / 144 degrees F
                        Module voltage          : 3.3280 V
                        Receiver signal average optical power : 0.2685 mW / -5.71 dBm
                        Laser bias current high alarm          : Off
                        Laser bias current low alarm           : Off
                        Laser bias current high warning        : Off
                        Laser bias current low warning         : Off
                        Laser output power high alarm          : Off
                        Laser output power low alarm           : Off
                        Laser output power high warning        : Off
                        Laser output power low warning         : Off
                        Module temperature high alarm          : Off
                        Module temperature low alarm           : Off
                        Module temperature high warning        : Off
                        Module temperature low warning         : Off
                        Module voltage high alarm              : Off
                        Module voltage low alarm               : Off
                        Module voltage high warning           : Off
                        Module voltage low warning            : Off
                        Laser rx power high alarm              : Off
                        Laser rx power low alarm               : Off
                        Laser rx power high warning           : Off
                        Laser rx power low warning            : Off
                        Laser bias current high alarm threshold : 80.000 mA
                        Laser bias current low alarm threshold : 2.000 mA
                        Laser bias current high warning threshold : 70.000 mA
                        Laser bias current low warning threshold : 4.000 mA
                        Laser output power high alarm threshold : 1.2600 mW / 1.00 dBm
                        Laser output power low alarm threshold : 0.0440 mW / -13.57 dBm
                        Laser output power high warning threshold : 0.7950 mW / -1.00 dBm
                        Laser output power low warning threshold : 0.0700 mW / -11.55 dBm
                        Module temperature high alarm threshold : 110 degrees C / 230 degrees F
                        Module temperature low alarm threshold : -40 degrees C / -40 degrees F
                        Module temperature high warning threshold : 93 degrees C / 199 degrees F
                        Module temperature low warning threshold : -30 degrees C / -22 degrees F
                        Module voltage high alarm threshold      : 3.900 V
                        Module voltage low alarm threshold       : 2.700 V
                        Module voltage high warning threshold    : 3.700 V
                        Module voltage low warning threshold     : 2.900 V
                        Laser rx power high alarm threshold      : 1.1749 mW / 0.70 dBm
                        Laser rx power low alarm threshold       : 0.0039 mW / -24.09 dBm
                        Laser rx power high warning threshold    : 0.7942 mW / -1.00 dBm
                        Laser rx power low warning threshold     : 0.0100 mW / -20.00 dBm

```

```

show interfaces      user@host> show interfaces diagnostics optics so-1/0/0
diagnostics optics  Physical interface: so-1/0/0
(XENPAK MSA Optics) Laser bias current           : 49.010 mA
                        Laser output power          : 1.263 mW / 1.01 dBm
                        Module temperature       : 17 degrees C / 62 degrees F
                        Laser rx power          : 0.060 mW / -12.21 dBm
                        Laser bias current high alarm          : Off
                        Laser bias current low alarm           : Off
                        Laser output power high alarm          : Off
                        Laser output power low alarm           : Off
                        Module temperature high alarm          : Off
                        Module temperature low alarm           : Off
                        Laser rx power high alarm              : Off

```

```

Laser rx power low alarm           : Off
Laser bias current high warning    : Off
Laser bias current low warning     : Off
Laser output power high warning    : Off
Laser output power low warning     : Off
Module temperature high warning    : Off
Module temperature low warning     : Off
Laser rx power high warning        : Off
Laser rx power low warning         : Off

```

**show interfaces
diagnostics optics
(XFP Optics)**

```
user@host> show interfaces diagnostics optics so-7/0/0
```

```
Physical interface: so-7/0/0
```

```

Link : 0
Laser bias current           : 50.776 mA
Laser output power          : 0.4030 mW / -3.95 dBm
Laser temperature           : 29.0 degrees C / 84.2 degrees F
Laser rx power              : 0.4671 mW / -3.31 dBm
Laser bias current high alarm : Off
Laser bias current low alarm  : Off
Laser bias current high warning : Off
Laser bias current low warning : Off
Laser output power high alarm  : Off
Laser output power low alarm   : Off
Laser output power high warning : Off
Laser output power low warning : Off
Laser temperature high alarm   : Off
Laser temperature low alarm    : Off
Laser temperature high warning : Off
Laser temperature low warning  : Off
Laser rx power high alarm      : Off
Laser rx power low alarm       : Off
Laser rx power high warning    : Off
Laser rx power low warning     : Off
Module not ready alarm         : Off
Module power down alarm        : Off
Tx data not ready alarm        : Off
Tx not ready alarm             : Off
Tx laser fault alarm           : Off
Tx CDR loss of lock alarm      : Off
Rx not ready alarm             : Off
Rx loss of signal alarm        : Off
Rx CDR loss of lock alarm      : Off
Laser bias current high alarm threshold : 130.000 mA
Laser bias current low alarm threshold  : 10.000 mA
Laser bias current high warning threshold : 120.000 mA
Laser bias current low warning threshold : 12.000 mA
Laser output power high alarm threshold : 0.8910 mW / -0.50 dBm
Laser output power low alarm threshold  : 0.2230 mW / -6.52 dBm
Laser output power high warning threshold : 0.7940 mW / -1.00 dBm
Laser output power low warning threshold : 0.2510 mW / -6.00 dBm
Laser temperature high alarm threshold : 90.0 degrees C / 194.0 degrees F
Laser temperature low alarm threshold  : -5.0 degrees C / 23.0 degrees F
Laser temperature high warning threshold : 85.0 degrees C / 185.0 degrees F
Laser temperature low warning threshold : 0.0 degrees C / 32.0 degrees F
Laser rx power high alarm threshold    : 1.2589 mW / 1.00 dBm
Laser rx power low alarm threshold     : 0.0323 mW / -14.91 dBm
Laser rx power high warning threshold  : 1.1220 mW / 0.50 dBm
Laser rx power low warning threshold   : 0.0363 mW / -14.40 dBm

```

```
...
```


Part 8

ATM Interfaces

- ATM Interface Operational Mode Commands on page 397
- ILMI Interface Operational Mode Commands on page 447

Chapter 12

ATM Interface Operational Mode Commands

Table 82 on page 397 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Asynchronous Transfer Mode (ATM) interfaces on M-series and T-series routing platforms, and ATM-over-asymmetrical digital subscriber line (ADSL) and ATM-over-symmetric high-speed digital subscriber line (SHDSL) interfaces on the J-series routing platform. An ATM-over-ADSL interface and an ATM-over-SHDSL interface is configured over an underlying ATM interface.

Table 82: ATM Interface Operational Mode Commands

| Task | Command |
|---|---|
| Display status information about ATM interfaces. | <code>show interfaces (ATM)</code> |
| Display status information about ATM-over-ADSL interfaces. | <code>show interfaces (ATM-over-ADSL)</code> |
| Display status information about ATM-over-SHDSL interfaces. | <code>show interfaces (ATM-over-SHDSL)</code> |

ATM-over-ADSL interfaces are used to transport Point-to-Point Protocol over Ethernet (PPPoE) frames or Point-to-Point Protocol over ATM (PPPoA) frames over an ADSL loop and a digital subscriber line access multiplexer (DSLAM). Both PPPoE and PPPoA connect multiple hosts on an Ethernet LAN to a remote site through the J-series Services Router. The hosts share a common digital subscriber line (DSL), a cable modem, or a wireless connection to the Internet.

ATM-over-SHDSL interfaces are used to transport network traffic through a point-to-point connection to a DSL access multiplexer (DSLAM).



NOTE: For information about monitoring and troubleshooting PPPoE interfaces (pp0), which are used in conjunction with ATM-over-ADSL interfaces, see “PPPoE Interface Operational Mode Commands” on page 305. For more information about monitoring and troubleshooting ATM interfaces, see “Investigate ATM Interfaces” in the *JUNOS Interfaces Network Operations Guide*.

show interfaces (ATM)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>at-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified ATM interface. |
| Options | <p><i>at-fpc/pic/port</i>—Display standard information about the specified ATM interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display the SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ATM1, SONET Mode) on page 412</p> <p>show interfaces brief (ATM1, SONET Mode) on page 413</p> <p>show interfaces detail (ATM1, SONET Mode) on page 413</p> <p>show interfaces extensive (ATM1, SONET Mode) on page 414</p> <p>show interfaces (ATM2, SDH Mode) on page 416</p> <p>show interfaces brief (ATM2, SDH Mode) on page 417</p> <p>show interfaces detail (ATM2, SDH Mode) on page 418</p> <p>show interfaces extensive (ATM2, SDH Mode) on page 419</p> <p>show interfaces (ATM2, SONET Mode) on page 422</p> <p>show interfaces brief (ATM2, SONET Mode) on page 423</p> <p>show interfaces detail (ATM2, SONET Mode) on page 424</p> <p>show interfaces extensive (ATM2, SONET Mode) on page 426</p> |
| Output Fields | Table 83 on page 398 lists the output fields for the show interfaces (ATM) command. Output fields are listed in the approximate order in which they appear. |

Table 83: ATM show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---------------------------------|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------|---|-----------------------|
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88 | All levels |
| Description | Configured interface description. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface: <ul style="list-style-type: none"> ■ ATM-CCC-CELL-RELAY—ATM cell relay for CCC. ■ ATM-CCC-VC-MUX—ATM virtual circuit (VC) for CCC. ■ ATM-CISCO-NLPID—Cisco-compatible ATM NLPID encapsulation. ■ ATM-MIPP-LLC—ATM MLPPP over ATM Adaptation Layer 5 (AAL5)/logical link control (LLC). ■ ATM-NLPID—ATM NLPID encapsulation. ■ ATM-PPP-LLC—ATM PPP over AAL5/LLC. ■ ATM-PPP-VC-MUX—ATM PPP over raw AAL5. ■ ATM-PVC—ATM permanent virtual circuits. ■ ATM-SNAP—ATM LLC/SNAP encapsulation. ■ ATM-TCC-SNAP—ATM LLC/SNAP for translational cross-connection. ■ ATM-TCC-VC-MUX—ATM VC for translational cross-connection. ■ ATM-VC-MUX—ATM VC multiplexing. ■ ETHER-OVER-ATM-LLC—Ethernet over ATM (LLC/SNAP) encapsulation. ■ ETHER-VPLS-OVER-ATM-LLC—Ethernet VPLS over ATM (bridging) encapsulation. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source: Internal or External . | All levels |
| framing Mode | Framing mode: SONET or SDH . | All levels |
| Speed | Speed at which the interface is running as represented by the interface type (for example, OC3 , ADSL2+ , and SHDSL(2-wire)). | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| Payload scrambler | Whether payload scrambling is enabled. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| CoS queues | Number of CoS queues configured. | detail extensive none |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Current address | Ethernet MAC address for this interface for Ethernet over ATM encapsulation. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive none |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Statistics for traffic on the interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious: <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and frame check sequence (FCS) errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's random early detection (RED) mechanism. ■ Invalid VCs—Number of cells that arrived for a nonexistent VC. ■ Framing errors—Sum of AAL5 packets that have FCS errors, reassembly timeout errors, and length errors. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ Resource errors—Sum of transmit drops. | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------|--|-----------------------|
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If it increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| SONET alarms | <p>SONET media-specific defects that prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SONET PHY, SONET section, SONET line, and SONET path.</p> | detail extensive none |
| SONET defects | | |
| SONET PHY | <p>Counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------|---|-----------------|
| SONET section | <p>Counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B1—Bit interleaved parity for SONET section overhead ■ SEF—Severely errored framing ■ LOL—Loss of light ■ LOF—Loss of frame ■ ES-S—Errored seconds (section) ■ SES-S—Severely errored seconds (section) ■ SEFS-S—Severely errored framing seconds (section) | extensive |
| SONET line | <p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B2—Bit interleaved parity for SONET line overhead ■ REI-L—Remote error indication (near-end line) ■ RDI-L—Remote defect indication (near-end line) ■ AIS-L—Alarm indication signal (near-end line) ■ BERR-SF—Bit error rate fault signal failure ■ BERR-SD—Bit error rate defect signal degradation ■ ES-L—Errored seconds (near-end line) ■ SES-L—Severely errored seconds (near-end line) ■ UAS-L—Unavailable seconds (near-end line) ■ ES-LFE—Errored seconds (far-end line) ■ SES-LFE—Severely errored seconds (far-end line) ■ UAS-LFE—Unavailable seconds (far-end line) | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------------|---|-----------------|
| SONET path | <p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B3—Bit interleaved parity for SONET section overhead ■ REI-P—Remote error indication ■ LOP-P—Loss of pointer (path) ■ AIS-P—Path alarm indication signal ■ RDI-P—Path remote defect indication ■ UNEQ-P—Path unequipped ■ PLMP—Path payload label mismatch ■ ES-P—Errored seconds (near-end STS path) ■ SES-P—Severely errored seconds (near-end STS path) ■ UAS-P—Unavailable seconds (near-end STS path) ■ ES-PFE—Errored seconds (far-end STS path) ■ SES-PFE—Severely errored seconds (far-end STS path) ■ UAS-PFE—Unavailable seconds (far-end STS path) | extensive |
| Received SONET overhead | <p>Values of the received and transmitted SONET overhead:</p> <ul style="list-style-type: none"> ■ C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. | extensive |
| Transmitted SONET overhead | <ul style="list-style-type: none"> ■ F1—Section user channel byte. This byte is set aside for the purposes of users. ■ K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. ■ J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. ■ S1—Synchronization status. The S1 byte is located in the first STS-1 of an STS-N. ■ Z3 and Z4—Allocated for future use. | |
| SDH alarms | <p>SDH media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SDH PHY, SDH regenerator section, SDH multiplex section, and SDH path.</p> | All levels |
| SDH defects | | |

Table 83: ATM show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------|
| SDH PHY | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |
| SDH regenerator section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ RS-BIP8—24-bit BIP for multiplex section overhead (B2 bytes) ■ OOF—Out of frame ■ LOS—Loss of signal ■ LOF—Loss of frame ■ RS-ES—Errored seconds (near-end regenerator section) ■ RS-SES—Severely errored seconds (near-end regenerator section) ■ RS-SEFS—Severely errored framing seconds (regenerator section) | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------|---|-----------------|
| SDH multiplex section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ MS-BIP24—8-bit BIP for high-order path overhead (B3 byte) ■ MS-FEBE—Far-end block error (multiplex section) ■ MS-FERF—Far-end remote fail (multiplex section) ■ MS-AIS—alarm indication signal (multiplex section) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ MS-ES—Errored seconds (near-end multiplex section) ■ MS-SES—Severely errored seconds (near-end multiplex section) ■ MS-UAS—Unavailable seconds (near-end multiplex section) ■ MS-ES-FE—Errored seconds (far-end multiplex section) ■ MS-SES-FE—Severely errored seconds (far-end multiplex section) ■ MS-UAS-FE—Unavailable seconds (far-end multiplex section) | extensive |
| SDH path | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ HP-BIP8—8-bit BIP for regenerator section overhead (B1 byte) ■ HP-FEBE—Far-end block error (high-order path) ■ HP-LOP—Loss of pointer (high-order path) ■ HP-AIS—High-order-path alarm indication signal ■ HP-FERF—Far-end remote fail (high-order path) ■ HP-UNEQ—Unequipped (high-order path) ■ HP-PLM—Payload label mismatch (high-order path) ■ HP-ES—Errored seconds (near-end high-order path) ■ HP-SES—Severely errored seconds (near-end high-order path) ■ HP-UAS—Unavailable seconds (near-end high-order path) ■ HP-ES-FE—Errored seconds (far-end high-order path) ■ HP-SES-FE—Severely errored seconds (far-end high-order path) ■ HP-UAS-FE—Unavailable seconds (far-end high-order path) | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------|
| Received SDH overhead | Values of the received and transmitted SONET overhead: | extensive |
| Transmitted SDH overhead | <ul style="list-style-type: none"> ■ C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. ■ F1—Section user channel byte. This byte is set aside for the purposes of users. ■ K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. ■ J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. ■ S1—Synchronization status. The S1 byte is located in the first STS-1 of an STS-N. ■ Z3 and Z4—Allocated for future use. | |
| Received path trace | SONET/SDH interfaces allow path trace bytes to be sent inband across the SONET/SDH link. Juniper Networks and other router manufacturers use these bytes to help diagnose misconfigurations and network errors by setting the transmitted path trace message so that it contains the system hostname and name of the physical interface. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits. | extensive |
| Transmitted path trace | | |
| ATM Status | ATM state information: <ul style="list-style-type: none"> ■ HCS State—Status of the header check sequence. ATM uses the HCS field in the cell header in the cell delineation process to frame ATM cell boundaries. The HCS is an FCS-8 calculation over the first four octets of the ATM cell header. ■ LOC—Current loss of cell (LOC) delineation state. OK means that no LOC is currently asserted. | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------|---|-----------------|
| ATM Statistics | <p>ATM statistics for the interface:</p> <ul style="list-style-type: none"> ■ Uncorrectable HCS errors—Number of cells dropped because the cell delineation failed. These errors most likely indicate that a SONET/SDH layer problem has occurred. ■ Correctable HCS errors—Number of correctable HCS errors that occurred. The cell delineation process can recover from these errors and locate the ATM cell boundary, although the framing process is not quite stable. The ATM cell is not dropped. This counter increases when the cell delineation process changes its state from present to sync (for example, when a cable is plugged into the interface). <p>The following error statistics are from the framer:</p> <ul style="list-style-type: none"> ■ Tx cell FIFO overruns—Number of overruns in the transmit FIFO. ■ Rx cell FIFO overruns—Number of overruns in the receive FIFO. ■ Rx cell FIFO underruns—Number of underruns in the receive FIFO. ■ Input cell count—Number of ATM cells received by the interface (not including idle cells). ■ Output cell count—Number of ATM cells transmitted by the interface (not including idle cells). ■ Output idle cell count—Number of idle cells sent by the port. When ATM has nothing to send, it sends idle cells to fill the time slot. ■ Output VC queue drops—Number of packets dropped by a port on the PIC. Packets are dropped because of queue limits on the VCs. <p>The following error statistics are from the SAR:</p> <ul style="list-style-type: none"> ■ Input no buffers—Number of AAL5 packets dropped because no channel blocks or buffers were available to handle them. ■ Input length errors—Number of AAL5 packets dropped because their length was incorrect. Usually, these errors occur because a cell has been corrupted or lost, or because the length field was corrupted. They can also mean the AAL5 length field was zero. ■ Input timeouts—Number of AAL5 packets dropped because of a reassembly timeout. ■ Input invalid VCs—Number of AAL5 packets dropped because the header was unrecognized (because the VC was not correct or not configured). ■ Input bad CRCs—Number of AAL5 packets dropped because of frame check sequence errors. ■ Input OAM cell no buffers—Number of received OAM cells or raw cells dropped because no buffers were available to handle them. ■ L2 circuit out-of-sequence packets—(Layer 2 AAL5 mode) Number of AAL5 packets that are out of sequential order. | extensive |

Table 83: ATM show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|--|-----------------|
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ CoS transmit queue—Queue number and its associated user-configured forwarding class name. ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. The default is 25 percent. ■ Bandwidth <i>bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer%</i>—Percentage of buffer space allocated to the queue. The default is 25 percent. ■ Buffer <i>usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: <i>low</i> or <i>high</i>. ■ Limit—Displayed if rate limiting is configured for the queue: <ul style="list-style-type: none"> ■ <i>exact</i>—The queue transmits only up to the configured bandwidth, even if excess bandwidth is available. ■ <i>none</i>—The queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| VPI | <p>(ATM2) Virtual path identifier information:</p> <ul style="list-style-type: none"> ■ Flags—VPI flags can be one or more of the following: <ul style="list-style-type: none"> ■ Active (virtual path is up) ■ OAM (operation and maintenance is enabled) ■ Shaping (shaping is configured) ■ CBR, Peak ■ OAM, Period—Interval at which OAM F4 loopback cells are sent. ■ Up count—Number of F4 OAM cells required to consider the virtual path up; the range is 1 through 255. ■ Down count—Number of F4 OAM cells required to consider the virtual path down; the range is 1 through 255. ■ Total down time—Total number of seconds the VPI has been down since it was opened, using the format Total down time: hh:mm:ss or Never. ■ Last down—Time of last Down transition, using the format Last down: hh:mm:ss ago or Never. ■ OAM F4 cell statistics—(Nonpromiscuous mode) OAM F4 statistics: <ul style="list-style-type: none"> ■ Total received—Number of OAM4 cells received. ■ Total sent—Number of OAM F4 cells sent. ■ Loopback received—Number of OAM F4 loopback cells received. ■ Loopback sent—Number of OAM F4 loopback cells sent. ■ Last received—Time at which the last OAM F4 cell was received. ■ Last sent—Time at which the last OAM F4 cell was sent. ■ RDI received—Number of OAM F4 cells received with the Remote Defect Indication bit set. ■ RDI sent—Number of OAM F4 cells sent with the RDI bit set. ■ AIS received—Number of OAM F4 cells received with the Alarm Indication Signal bit set. ■ AIS sent—Number of OAM F4 cells sent with the AIS bit set. <p>Traffic statistics:</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the VPI. ■ Output bytes—Number of bytes transmitted on the VPI. ■ Input packets—Number of packets received on the VPI. ■ Output packets—Number of packets transmitted on the VPI. | detail extensive none |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------------|---|-----------------------|
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <i>inet</i> , the IP address of the interface is also displayed. | brief |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table <i>inet.0</i> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|--|-----------------|
| VCI | <p>Virtual circuit identifier number and information:</p> <ul style="list-style-type: none"> ■ Flags—VCI flags: <ul style="list-style-type: none"> ■ Active—VCI is up and in working condition. ■ CCC down—VCI CCC is not in working condition. ■ Closed—VCI is closed because the user disabled the logical or physical interface from the CLI. ■ Configured—VCI is configured. ■ Down—VCI is not in working condition. The VCI might have alarms, defects, F5 AIS/RDI, or no response to OAM loopback cells. ■ ILMI—VCI is up and in working condition. ■ OAM—OAM loopback is enabled. ■ Multicast—VCI is a multicast VCI or DLCI. ■ Multipoint destination—VCI is configured as a multipoint destination. ■ None—No VCI flags. ■ Passive-OAM—Passive OAM is enabled. ■ Shaping—Shaping is enabled. ■ Sustained—Shaping rate is set to sustained. ■ Unconfigured—VCI is not configured. ■ Total down time—Total number of seconds the VCI has been down, using the format Total down time: hh:mm:ss or Never. ■ Last down—Time of last Down transition, using the format Last down: hh:mm:ss. ■ EPD threshold—(ATM2 only) Threshold at which a packet is dropped when the queue size (in number of cells) exceeds the early packet-discard (EPD) value. | All levels |

Table 83: ATM show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------|--|-----------------|
| VCI (continued) | <ul style="list-style-type: none"> ■ Transmit weight cells—(ATM2 only) Amount of bandwidth assigned to this queue. ■ ATM per-VC transmit statistics: <ul style="list-style-type: none"> ■ Tail queue packet drops—Number of packets dropped because of bandwidth constraints. Indicates that packets are queued to send out at a rate faster than allowed. ■ OAM F4 cell statistics—(Nonpromiscuous mode) OAM F4 statistics: <ul style="list-style-type: none"> ■ Total received—Number of OAM4 cells received. ■ Total sent—Number of OAM F4 cells sent. ■ Loopback received—Number of OAM F4 loopback cells received. ■ Loopback sent—Number of OAM F4 loopback cells sent. ■ Last received—Time at which the last OAM F4 cell was received. ■ Last sent—Time at which the last OAM F4 cell was sent. ■ RDI received—Number of OAM F4 cells received with the Remote Defect Indication bit set. ■ RDI sent—Number of OAM F4 cells sent with the RDI bit set. ■ AIS received—Number of OAM F4 cells received with the Alarm Indication Signal bit set. ■ AIS sent—Number of OAM F4 cells sent with the AIS bit set. ■ Traffic statistics—Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | All levels |

```

show interfaces      user@host> show interfaces at-1/0/0
(ATM1, SONET Mode)  Physical interface: at-1/0/0, Enabled, Physical link is Up
                        Interface index: 300, SNMP ifIndex: 194
                        Description: to allspice at-1/0/0
                        Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
                        Speed: OC3, Loopback: None, Payload scrambler: Enabled
                        Device flags   : Present Running
                        Link flags     : None
                        CoS queues    : 4 supported, 4 maximum usable queues
                        Current address: 00:05:85:02:38:7e
                        Last flapped  : 2006-02-24 14:28:12 PST (6d 01:51 ago)
                        Input rate    : 0 bps (0 pps)
                        Output rate   : 0 bps (0 pps)
                        SONET alarms  : None
                        SONET defects : None

                        Logical interface at-1/0/0.0 (Index 64) (SNMP ifIndex 204)
                        Flags: Point-To-Point SNMP-Traps Encapsulation: ATM-SNAP
                        Input packets : 0
                        Output packets: 0
                        Protocol inet, MTU: 4470

```



```

Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 192.168.220.24/30, Local: 192.168.220.26,
  Broadcast: 192.168.220.27
Protocol iso, MTU: 4470
Flags: None
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never
Input packets : 0
Output packets: 0

```

**show interfaces brief
(ATM1, SONET Mode)**

```

user@host> show interfaces at-1/0/0 brief
Physical interface: at-1/0/0, Enabled, Physical link is Up
Description: to allspice at-1/0/0
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None

Logical interface at-1/0/0.0
Flags: Point-To-Point SNMP-Traps Encapsulation: ATM-SNAP
inet 192.168.220.26/30
iso
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never

```

**show interfaces detail
(ATM1, SONET Mode)**

```

user@host> show interfaces at-1/0/0 detail
Physical interface: at-1/0/0, Enabled, Physical link is Up
Interface index: 300, SNMP ifIndex: 194, Generation: 183
Description: to allspice at-1/0/0
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:02:38:7e
Last flapped   : 2006-02-24 14:28:12 PST (6d 01:55 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   : 0          0 bps
Output bytes  : 0          0 bps
Input packets : 0          0 pps
Output packets: 0          0 pps
Egress queues: 4 supported, 4 in use
Queue counters:

```

| | Queued packets | Transmitted packets | Dropped packets |
|----------------|----------------|---------------------|-----------------|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 0 | 0 | 0 |

```

SONET alarms   : None
SONET defects  : None

```

Logical interface at-1/0/0.0 (Index 64) (SNMP ifIndex 204) (Generation 5)

```

Flags: Point-To-Point SNMP-Traps Encapsulation: ATM-SNAP
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Transit statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Protocol inet, MTU: 4470, Generation: 13, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.220.24/30, Local: 192.168.220.26,
    Broadcast: 192.168.220.27, Generation: 14
Protocol iso, MTU: 4470, Generation: 14, Route table: 0
  Flags: None
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0

```

**show interfaces
extensive
(ATM1, SONET Mode)**

```

user@host> show interfaces at-1/0/0 extensive
Physical interface: at-1/0/0, Enabled, Physical link is Up
Interface index: 300, SNMP ifIndex: 194, Generation: 183
Description: to allspice at-1/0/0
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags : Present Running
Link flags : None
CoS queues : 4 supported, 4 maximum usable queues
Hold-times : Up 0 ms, Down 0 ms
Current address: 00:05:85:02:38:7e
Last flapped : 2006-02-24 14:28:12 PST (6d 01:56 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Input errors:
  Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
  Resource errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

  Resource errors: 0

```

Egress queues: 4 supported, 4 in use

| Queue counters: | Queued packets | Transmitted packets | Dropped packets |
|-----------------|----------------|---------------------|-----------------|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 0 | 0 | 0 |

SONET alarms : None

SONET defects : None

| SONET PHY: | Seconds | Count | State |
|------------|---------|-------|-------|
| PLL Lock | 0 | 0 | OK |
| PHY Light | 0 | 0 | OK |

SONET section:

| | | | |
|--------|---|---|----|
| BIP-B1 | 0 | 0 | |
| SEF | 0 | 0 | OK |
| LOS | 0 | 0 | OK |
| LOF | 0 | 0 | OK |
| ES-S | 0 | | |
| SES-S | 0 | | |
| SEFS-S | 0 | | |

SONET line:

| | | | |
|---------|---|---|----|
| BIP-B2 | 0 | 0 | |
| REI-L | 0 | 0 | |
| RDI-L | 0 | 0 | OK |
| AIS-L | 0 | 0 | OK |
| BERR-SF | 0 | 0 | OK |
| BERR-SD | 0 | 0 | OK |
| ES-L | 0 | | |
| SES-L | 0 | | |
| UAS-L | 0 | | |
| ES-LFE | 0 | | |
| SES-LFE | 0 | | |
| UAS-LFE | 0 | | |

SONET path:

| | | | |
|---------|---|---|----|
| BIP-B3 | 0 | 0 | |
| REI-P | 0 | 0 | |
| LOP-P | 0 | 0 | OK |
| AIS-P | 0 | 0 | OK |
| RDI-P | 0 | 0 | OK |
| UNEQ-P | 1 | 1 | OK |
| PLM-P | 0 | 0 | OK |
| ES-P | 1 | | |
| SES-P | 1 | | |
| UAS-P | 0 | | |
| ES-PFE | 0 | | |
| SES-PFE | 0 | | |
| UAS-PFE | 0 | | |

Received SONET overhead:

| | | | | |
|----|------------|-----------------|------------|--------|
| F1 | : 0x00, J0 | : 0x00, K1 | : 0x00, K2 | : 0x00 |
| S1 | : 0x00, C2 | : 0x13, C2(cmp) | : 0x13, F2 | : 0x00 |
| Z3 | : 0x00, Z4 | : 0x00, S1(cmp) | : 0x00 | |

Transmitted SONET overhead:

| | | | | |
|----|------------|------------|------------|--------|
| F1 | : 0x00, J0 | : 0x01, K1 | : 0x00, K2 | : 0x00 |
| S1 | : 0x00, C2 | : 0x13, F2 | : 0x00, Z3 | : 0x00 |
| Z4 | : 0x00 | | | |

ATM status:

HCS state: Sync

```

LOC      :      OK
ATM Statistics:
  Uncorrectable HCS errors: 0, Correctable HCS errors: 0,
  Tx cell FIFO overruns: 0, Rx cell FIFO overruns: 0,
  Rx cell FIFO underruns: 0, Input cell count: 0, Output cell count: 0,
  Output idle cell count: 0, Output VC queue drops: 0, Input no buffers: 0,
  Input length errors: 0, Input timeouts: 0, Input invalid VCs: 0,
  Input bad CRCs: 0, Input OAM cell no buffers: 0
Packet Forwarding Engine configuration:
  Destination slot: 1
  CoS transmit queue      Bandwidth      Buffer      Priority      Limit
                           %      bps      %      usec
0 best-effort      95      147744000      95      0      low      none
3 network-control  5      7776000      5      0      low      none

Logical interface at-1/0/0.0 (Index 64) (SNMP ifIndex 204) (Generation 5)
Flags: Point-To-Point SNMP-Traps Encapsulation: ATM-SNAP
Traffic statistics:
  Input bytes :      0
  Output bytes :      0
  Input packets:      0
  Output packets:      0
Local statistics:
  Input bytes :      0
  Output bytes :      0
  Input packets:      0
  Output packets:      0
Transit statistics:
  Input bytes :      0      0 bps
  Output bytes :      0      0 bps
  Input packets:      0      0 pps
  Output packets:      0      0 pps
Protocol inet, MTU: 4470, Generation: 13, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.220.24/30, Local: 192.168.220.26,
    Broadcast: 192.168.220.27, Generation: 14
Protocol iso, MTU: 4470, Generation: 14, Route table: 0
  Flags: None
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:
    Input bytes :      0
    Output bytes :      0
    Input packets:      0
    Output packets:      0

```

```

show interfaces user@host> show interfaces at-0/2/1
(ATM2, SDH Mode) Physical interface: at-0/2/1, Enabled, Physical link is Up
  Interface index: 154, SNMP ifIndex: 42
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SDH mode, Speed: OC3,

  Loopback: None, Payload scrambler: Enabled
  Device flags : Present Running
  Link flags : None
  CoS queues : 4 supported, 4 maximum usable queues
  Current address: 00:05:85:8f:30:3f
  Last flapped : 2006-03-24 13:29:58 PST (00:04:48 ago)

```

```

Input rate      : 0 bps (0 pps)
Output rate     : 0 bps (0 pps)
SDH  alarms    : None
SDH  defects    : None
  VPI 0
    Flags: Active
    Total down time: 0 sec, Last down: Never
Traffic statistics:
  Input  packets:                0
  Output packets:                0

Logical interface at-0/2/1.0 (Index 75) (SNMP ifIndex 51)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: ATM-SNAP
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 4470
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 10.0.12.6, Local: 10.0.12.5
  Protocol iso, MTU: 4470
    Flags: None
  VCI 0.128
    Flags: Active
    Total down time: 0 sec, Last down: Never
    EPD threshold: 2129, Transmit weight cells: 0
      Input packets : 0
      Output packets: 0

Logical interface at-0/2/1.32767 (Index 76) (SNMP ifIndex 50)
  Flags: Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Input packets : 0
  Output packets: 0
  VCI 0.4
    Flags: Active
    Total down time: 0 sec, Last down: Never
    EPD threshold: 0, Transmit weight cells: 0
      Input packets : 0
      Output packets: 0

```

**show interfaces brief
(ATM2, SDH Mode)**

```

user@host> show interfaces at-0/2/1 brief
Physical interface: at-0/2/1, Enabled, Physical link is Up
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SDH mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
Logical interface at-0/2/1.0
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: ATM-SNAP
  inet  10.0.12.5      --> 10.0.12.6
  iso
  VCI 0.128
    Flags: Active
    Total down time: 0 sec, Last down: Never
    EPD threshold: 2129, Transmit weight cells: 0

Logical interface at-0/2/1.32767
  Flags: Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  VCI 0.4
    Flags: Active

```

Total down time: 0 sec, Last down: Never
 EPD threshold: 0, Transmit weight cells: 0

show interfaces detail
(ATM2, SDH Mode)

```
user@host> show interfaces at-0/2/1 detail
Physical interface: at-0/2/1, Enabled, Physical link is Up
Interface index: 154, SNMP ifIndex: 42, Generation: 40
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SDH mode, Speed: OC3,

Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times    : Up 0 ms, Down 0 ms
Current address: 00:05:85:8f:30:3f
Last flapped   : 2006-03-24 13:29:58 PST (00:05:10 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   :                0                0 bps
Output bytes  :                0                0 bps
Input packets :                0                0 pps
Output packets:               0                0 pps
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort                0                0                0
  1 expedited-fo                0                0                0
  2 assured-forw                0                0                0
  3 network-cont                0                0                0

SDH  alarms   : None
SDH  defects  : None
VPI 0
Flags: Active
Total down time: 0 sec, Last down: Never
Traffic statistics:
Input bytes   :                0
Output bytes  :                0
Input packets :                0
Output packets:               0

Logical interface at-0/2/1.0 (Index 75) (SNMP ifIndex 51) (Generation 25)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: ATM-SNAP
Traffic statistics:
Input bytes   :                0
Output bytes  :                0
Input packets :                0
Output packets:               0
Local statistics:
Input bytes   :                0
Output bytes  :                0
Input packets :                0
Output packets:               0
Transit statistics:
Input bytes   :                0                0 bps
Output bytes  :                0                0 bps
Input packets :                0                0 pps
Output packets:               0                0 pps
Protocol inet, MTU: 4470, Generation: 62, Route table: 0
```

```

Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.12.6, Local: 10.0.12.5, Broadcast: Unspecified,
  Generation: 58
Protocol iso, MTU: 4470, Generation: 63, Route table: 0
Flags: None
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 0
ATM per-VC transmit statistics:
  Tail queue packet drops: 0
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Logical interface at-0/2/1.32767 (Index 76) (SNMP ifIndex 50) (Generation 26)
Flags: Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
VCI 0.4
Flags: Active
Total down time: 0 sec, Last down: Never
EPD threshold: 0, Transmit weight cells: 0
ATM per-VC transmit statistics:
  Tail queue packet drops: 0
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0

```

```

show interfaces user@host> show interfaces at-0/2/1 extensive
extensive Physical interface: at-0/2/1, Enabled, Physical link is Up
(ATM2, SDH Mode) Interface index: 154, SNMP ifIndex: 42, Generation: 40
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SDH mode, Speed: OC3,

Loopback: None, Payload scrambler: Enabled
Device flags : Present Running
Link flags : None
CoS queues : 4 supported, 4 maximum usable queues
Hold-times : Up 0 ms, Down 0 ms
Current address: 00:05:85:8f:30:3f
Last flapped : 2006-03-24 13:29:58 PST (00:06:49 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Input errors:

```

```

Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
Resource errors: 0
Output errors:
Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

Resource errors: 0
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort          0                0                0

1 expedited-fo         0                0                0

2 assured-forw         0                0                0

3 network-cont         0                0                0

SDH  alarms   : None
SDH  defects  : None
SDH PHY:
Seconds      Count  State
  PLL Lock      0      0 OK
  PHY Light     1      1 OK
SDH regenerator section:
RS-BIP8        2      8828
OOF            2        2 OK
LOS            2        1 OK
LOF            2        1 OK
RS-ES          4
RS-SES         3
RS-SEFS        2
SDH multiplex section:
MS-BIP24       2        771
MS-FEBE        1      17476
MS-FERF        2        1 OK
MS-AIS         2        1 OK
BERR-SF        0        0 OK
BERR-SD        0        0 OK
MS-ES          4
MS-SES         2
MS-UAS         0
MS-ES-FE       3
MS-SES-FE      2
MS-UAS-FE      0
SDH path:
HP-BIP8        1        6
HP-FEBE        1      251
HP-LOP         0        0 OK
HP-AIS         2        1 OK
HP-FERF        3        2 OK
HP-UNEQ        1        1 OK
HP-PLM         2        1 OK
HP-ES          4
HP-SES         3
HP-UAS         0
HP-ES-FE       3
HP-SES-FE      3
HP-UAS-FE      0
Received SDH overhead:
F1      : 0x00, J0      : 0x00, K1      : 0x00, K2      : 0x00

```



```

S1      : 0x00, C2      : 0x13, C2(cmp) : 0x13, F2      : 0x00
Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00
Transmitted SDH overhead:
F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
S1      : 0x00, C2      : 0x13, F2      : 0x00, Z3      : 0x00
Z4      : 0x00
ATM status:
HCS state:      Sync
LOC      :      OK
ATM Statistics:
Uncorrectable HCS errors: 0, Correctable HCS errors: 0,
Tx cell FIFO overruns: 0, Rx cell FIFO overruns: 0,
Rx cell FIFO underruns: 0, Input cell count: 0, Output cell count: 0,
Output idle cell count: 0, Output VC queue drops: 0, Input no buffers: 0,
Input length errors: 0, Input timeouts: 0, Input invalid VCs: 0,
Input bad CRCs: 0, Input OAM cell no buffers: 0
Packet Forwarding Engine configuration:
Destination slot: 0
VPI 0
Flags: Active
Total down time: 0 sec, Last down: Never
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0

Logical interface at-0/2/1.0 (Index 75) (SNMP ifIndex 51) (Generation 25)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: ATM-SNAP
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Transit statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Protocol inet, MTU: 4470, Generation: 62, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.0.12.6, Local: 10.0.12.5, Broadcast: Unspecified,
Generation: 58
Protocol iso, MTU: 4470, Generation: 63, Route table: 0
Flags: None
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 0
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0

```

```

        Output packets:                0
Logical interface at-0/2/1.32767 (Index 76) (SNMP ifIndex 50) (Generation 26)
Flags: Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes :                       0
  Output bytes :                      0
  Input packets:                     0
  Output packets:                    0
Local statistics:
  Input bytes :                       0
  Output bytes :                      0
  Input packets:                     0
  Output packets:                    0
VCI 0.4
Flags: Active
Total down time: 0 sec, Last down: Never
EPD threshold: 0, Transmit weight cells: 0
ATM per-VC transmit statistics:
  Tail queue packet drops: 0
Traffic statistics:
  Input bytes :                       0
  Output bytes :                      0
  Input packets:                     0
  Output packets:                    0

```

show interfaces
(ATM2, SONET Mode)

```

user@host> show interfaces at-0/3/1
Physical interface: at-0/3/1, Enabled, Physical link is Up
Interface index: 139, SNMP ifIndex: 67
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
CoS queues     : 4 supported, 4 maximum usable queues
Current address: 00:14:f6:22:58:5e
Last flapped   : 2006-03-13 17:46:36 PST (16:01:12 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)
SONET alarms   : None
SONET defects  : None
VPI 0
Flags: Active, OAM, Shaping
CBR, Peak: 50kbps
OAM, Period 30 sec, Up count: 10, Down count: 10
Total down time: 0 sec, Last down: Never
OAM F4 cell statistics:
Total received: 4, Total sent: 4
Loopback received: 4, Loopback sent: 4
RDI received: 0, RDI sent: 0
AIS received: 0
Traffic statistics:
  Input packets:                4
  Output packets:               30
VPI 10
Flags: Active
Total down time: 0 sec, Last down: Never
Traffic statistics:
  Input packets:                0
  Output packets:               0
Logical interface at-0/3/1.0 (Index 78) (SNMP ifIndex 77)
Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000

```

```

Encapsulation: ATM-SNAP
Input packets : 0
Output packets: 0
Protocol inet, MTU: 4470
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.0.59.5, Local: 10.0.59.6
Protocol iso, MTU: 4470
  Flags: None
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 10
    Input packets : 0
    Output packets: 0

Logical interface at-0/3/1.32767 (Index 79) (SNMP ifIndex 76)
  Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Input packets : 4
  Output packets: 30
  VCI 0.16
    Flags: Active, ILMI
    Total down time: 0 sec, Last down: Never
    EPD threshold: 0, Transmit weight cells: 0
      Input packets : 0
      Output packets: 26
  VCI 0.4
    Flags: Active, OAM
    OAM, Period 30 sec, Up count: 10, Down count: 10
    Total down time: 0 sec, Last down: Never
    EPD threshold: 2129, Transmit weight cells: 0
      Input packets : 4
      Output packets: 4
    OAM F4 cell statistics:
      Total received: 4, Total sent: 4
      Loopback received: 4, Loopback sent: 4
      RDI received: 0, RDI sent: 0
      AIS received: 0, AIS sent: 0

```

**show interfaces brief
(ATM2, SONET Mode)**

```

user@host> show interfaces at-0/3/1 brief
Physical interface: at-0/3/1, Enabled, Physical link is Up
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None

Logical interface at-0/3/1.0
  Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000
  Encapsulation: ATM-SNAP
  inet 10.0.59.6      --> 10.0.59.5
  iso
  VCI 0.128
    Flags: Active
    Total down time: 0 sec, Last down: Never
    EPD threshold: 2129, Transmit weight cells: 10

Logical interface at-0/3/1.32767
  Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  VCI 0.16

```

```

Flags: Active, ILMI
Total down time: 0 sec, Last down: Never
EPD threshold: 0, Transmit weight cells: 0
VCI 0.4
Flags: Active, OAM
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 0

```

**show interfaces detail
(ATM2, SONET Mode)**

```

user@host> show interfaces at-0/3/1 detail
Physical interface: at-0/3/1, Enabled, Physical link is Up
Interface index: 139, SNMP ifIndex: 67, Generation: 22
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:14:f6:22:58:5e
Last flapped   : 2006-03-13 17:46:36 PST (16:02:39 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   :          312          0 bps
Output bytes  :         2952          0 bps
Input packets :           6          0 pps
Output packets:          50          0 pps
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort          44             44             0
1 expedited-fo         0              0             0
2 assured-forw         0              0             0
3 network-cont         6              6             0

SONET alarms   : None
SONET defects  : None
VPI 0
Flags: Active, OAM, Shaping
CBR, Peak: 50kbps
OAM, Period 30 sec, Up count: 10, Down count: 10
Total down time: 0 sec, Last down: Never
OAM F4 cell statistics:
Total received: 6, Total sent: 6
Loopback received: 6, Loopback sent: 6
Last received: 00:00:29, Last sent: 00:00:29
RDI received: 0, RDI sent: 0
AIS received: 0
Traffic statistics:
Input bytes   :          312
Output bytes  :         2952
Input packets :           6
Output packets:          50
VPI 10
Flags: Active
Total down time: 0 sec, Last down: Never
Traffic statistics:
Input bytes   :           0
Output bytes  :           0
Input packets :           0

```

```

Output packets:                                0

Logical interface at-0/3/1.0 (Index 78) (SNMP ifIndex 77) (Generation 20)
Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000
Encapsulation: ATM-SNAP
Traffic statistics:
  Input bytes :                                0
  Output bytes :                               0
  Input packets:                              0
  Output packets:                              0
Local statistics:
  Input bytes :                                0
  Output bytes :                               0
  Input packets:                              0
  Output packets:                              0
Transit statistics:
  Input bytes :                                0                0 bps
  Output bytes :                               0                0 bps
  Input packets:                              0                0 pps
  Output packets:                              0                0 pps
Protocol inet, MTU: 4470, Generation: 38, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.59.5, Local: 10.0.59.6, Broadcast: Unspecified,
  Generation: 44
Protocol iso, MTU: 4470, Generation: 39, Route table: 0
Flags: None
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 10
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
  Input bytes :                                0
  Output bytes :                               0
  Input packets:                              0
  Output packets:                              0
Logical interface at-0/3/1.32767 (Index 79) (SNMP ifIndex 76) (Generation 21)
Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes :                                360
  Output bytes :                               3302
  Input packets:                               6
  Output packets:                              50
Local statistics:
  Input bytes :                                360
  Output bytes :                               3302
  Input packets:                               6
  Output packets:                              50
VCI 0.16
Flags: Active, ILMI
Total down time: 0 sec, Last down: Never
EPD threshold: 0, Transmit weight cells: 0
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
  Input bytes :                                0
  Output bytes :                               2640
  Input packets:                              0

```

```

Output packets:          44
VCI 0.4
Flags: Active, OAM
OAM, Period 30 sec, Up count: 10, Down count: 10
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 0
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
Input bytes :            312
Output bytes :           312
Input packets:           6
Output packets:          6
OAM F4 cell statistics:
Total received: 6, Total sent: 6
Loopback received: 6, Loopback sent: 6
Last received: 00:00:29, Last sent: 00:00:29
RDI received: 0, RDI sent: 0
AIS received: 0, AIS sent: 0

```

**show interfaces
extensive
(ATM2, SONET Mode)**

```

user@host> show interfaces at-0/3/1 extensive
Physical interface: at-0/3/1, Enabled, Physical link is Up
Interface index: 139, SNMP ifIndex: 67, Generation: 22
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:14:f6:22:58:5e
Last flapped   : 2006-03-13 17:46:36 PST (16:04:12 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :           520           0 bps
Output bytes :          4240           0 bps
Input packets:           10           0 pps
Output packets:           72           0 pps
Input errors:
Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
Resource errors: 0
Output errors:
Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

Resource errors: 0
Egress queues: 4 supported, 4 in use
Queue counters:

```

| | Queued packets | Transmitted packets | Dropped packets |
|----------------|----------------|---------------------|-----------------|
| 0 best-effort | 62 | 62 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 10 | 10 | 0 |

```

SONET alarms   : None
SONET defects  : None
SONET PHY:
Seconds        Count  State
PLL Lock       0      0 OK

```

```

PHY Light                0          0 OK
SONET section:
  BIP-B1                  0          0
  SEF                     0          0 OK
  LOS                     0          0 OK
  LOF                     0          0 OK
  ES-S                    0
  SES-S                   0
  SEFS-S                  0
SONET line:
  BIP-B2                  0          0
  REI-L                   0
  RDI-L                   0          0 OK
  AIS-L                   0          0 OK
  BERR-SF                 0          0 OK
  BERR-SD                 0          0 OK
  ES-L                    0
  SES-L                   0
  UAS-L                   0
  ES-LFE                  0
  SES-LFE                 0
  UAS-LFE                 0
SONET path:
  BIP-B3                  0          0
  REI-P                   0
  LOP-P                   0          0 OK
  AIS-P                   0          0 OK
  RDI-P                   0          0 OK
  UNEQ-P                  1          1 OK
  PLM-P                   0          0 OK
  ES-P                    1
  SES-P                   1
  UAS-P                   0
  ES-PFE                  0
  SES-PFE                 0
  UAS-PFE                 0
Received SONET overhead:
  F1      : 0x00, J0      : 0x00, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0x13, C2(cmp) : 0x13, F2      : 0x00
  Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00
Transmitted SONET overhead:
  F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0x13, F2      : 0x00, Z3      : 0x00
  Z4      : 0x00
ATM status:
  HCS state: Sync
  LOC      : OK
ATM Statistics:
  Uncorrectable HCS errors: 0, Correctable HCS errors: 0,
  Tx cell FIFO overruns: 0, Rx cell FIFO overruns: 0,
  Rx cell FIFO underruns: 0, Input cell count: 0, Output cell count: 0,
  Output idle cell count: 0, Output VC queue drops: 0, Input no buffers: 0,
  Input length errors: 0, Input timeouts: 0, Input invalid VCs: 0,
  Input bad CRCs: 0, Input OAM cell no buffers: 0
Packet Forwarding Engine configuration:
  Destination slot: 0
  VPI 0
    Flags: Active, OAM, Shaping
    CBR, Peak: 50kbps
    OAM, Period 30 sec, Up count: 10, Down count: 10
    Total down time: 0 sec, Last down: Never

```

```

OAM F4 cell statistics:
Total received: 10, Total sent: 10
Loopback received: 10, Loopback sent: 10
Last received: 00:00:02, Last sent: 00:00:02
RDI received: 0, RDI sent: 0
AIS received: 0
Traffic statistics:
  Input bytes :          520
  Output bytes :         4240
  Input packets:          10
  Output packets:         72
VPI 10
Flags: Active
Total down time: 0 sec, Last down: Never
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0

Logical interface at-0/3/1.0 (Index 78) (SNMP ifIndex 77) (Generation 20)
Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000
Encapsulation: ATM-SNAP
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
Local statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
Transit statistics:
  Input bytes :          0          0 bps
  Output bytes :          0          0 bps
  Input packets:          0          0 pps
  Output packets:         0          0 pps
Protocol inet, MTU: 4470, Generation: 38, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.59.5, Local: 10.0.59.6, Broadcast: Unspecified,
  Generation: 44
Protocol iso, MTU: 4470, Generation: 39, Route table: 0
Flags: None
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 10
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0

Logical interface at-0/3/1.32767 (Index 79) (SNMP ifIndex 76) (Generation 21)
Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:

```



```

Input bytes :          660
Output bytes :         5473
Input packets:          11
Output packets:         83
Local statistics:
Input bytes :          660
Output bytes :         5473
Input packets:          11
Output packets:         83
VCI 0.16
Flags: Active, ILMI
Total down time: 0 sec, Last down: Never
EPD threshold: 0, Transmit weight cells: 0
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
Input bytes :          0
Output bytes :         4320
Input packets:          0
Output packets:         72
VCI 0.4
Flags: Active, OAM
OAM, Period 30 sec, Up count: 10, Down count: 10
Total down time: 0 sec, Last down: Never
EPD threshold: 2129, Transmit weight cells: 0
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
Input bytes :          572
Output bytes :         572
Input packets:          11
Output packets:         11
OAM F4 cell statistics:
Total received: 11, Total sent: 11
Loopback received: 11, Loopback sent: 11
Last received: 00:00:18, Last sent: 00:00:18
RDI received: 0, RDI sent: 0
AIS received: 0, AIS sent: 0

```

show interfaces (ATM-over-ADSL)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>at-pim/0/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform) Display status information about the specified ATM-over-asynchronous DSL (ADSL) interface. |
| Options | <p><i>at-pim/0/port</i>—Display standard information about the specified ADSL interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display the SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ATM-over-ADSL) on page 431</p> <p>show interfaces brief (ATM-over-ADSL) on page 432</p> <p>show interfaces detail (ATM-over-ADSL) on page 433</p> <p>show interfaces extensive (ATM-over-ADSL) on page 434</p> |
| Output Fields | Table 84 on page 430 lists only output fields that are specific to the show interfaces (ATM-over-ADSL) command. For information about all other output fields, see Table 83 on page 398. |

Table 84: ATM-over-ADSL show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| ADSL alarms | Number and type of ADSL alarms. See “ADSL media” for details. | detail extensive none |
| ADSL defects | Number and type of ADSL defects. See “ADSL media” for details. | detail extensive none |

Table 84: ATM-over-ADSL show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-----------------|---|-----------------------|
| ADSL status | <p>Operational information for ATM-over-ADSL interfaces.</p> <ul style="list-style-type: none"> ■ Modem status—Status of the modem: Down, Training, or Showtime. ■ DSL mode—Configured line type of the digital subscriber line: adsl2plus, ansi-dmt, auto, itu-dmt, or itu-dmt-bis. ■ Last fail code—Reason for failure: ATU-C not detected, incompatible line condition, protocol error, message error, spurious ATU detected, forced silence, unselectable operation mode, or none. ■ Subfunction—Specified analog front-end chip and discrete front. ■ Seconds in showtime—Number of seconds the ADSL connection is in showtime. | detail extensive none |
| ADSL media | <p>Information about ADSL media-specific defects that can prevent the interface from passing packets. The following information is displayed for each defect:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. A state other than OK indicates a problem. <p>The possible defects are as follows:</p> <ul style="list-style-type: none"> ■ LOF—Loss of frame. ■ LOS—Loss of signal. ■ LOM—Loss of multiframe. ■ LOP—Loss of pointer. ■ LOCDI—Loss of cell delineation for an interleaved channel. ■ LOCDNI—Loss of cell delineation for a noninterleaved channel. | extensive |
| ADSL Statistics | <p>Information about the ADSL terminal unit-remote (ATU-R) at the far end of the connection and the ADSL terminal unit-central office (ATU-C) at the near end:</p> <ul style="list-style-type: none"> ■ Attenuation (dB)—Attenuation in decibels. ■ Capacity used (%)—Percentage of capacity used. ■ Noise margin (dB)—Maximum extraneous signal allowed without causing the output to deviate from an allowable level, in decibels. ■ Output power (dBm)—Amount of power used by the ATM-over-ADSL interface. ■ Bit rate (kbps)—Speed of data transfer on the ATM-over-ADSL interface, in kilobits per second. ■ CRC—Number of cyclic redundancy check errors. ■ FEC—Number of forward error corrections. ■ HEC—Number of header error checksums. ■ Received cells—Number of cells received through the interface. ■ Transmitted cells—Number of cells sent through the interface. | detail extensive |

```

show interfaces      user@host> show interfaces at-5/0/0
(ATM-over-ADSL)    Physical interface: at-5/0/0, Enabled, Physical link is Down
                     Interface index: 149, SNMP ifIndex: 68

```

```

Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
Speed: ADSL2+, Loopback: None
Device flags   : Present Running Down
Link flags     : None
CoS queues     : 8 supported, 8 in use
Current address: 00:05:85:c3:85:84
Last flapped   : 2005-12-19 15:36:02 PST (12w0d 18:33 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)
ADSL alarms    : None
ADSL defects   : None
ADSL status:
  Modem status  : Training
  DSL mode      : Adsl2plus  Annex A
  Last fail code: ATU-C not detected
  Subfunction   : 0x00
  Seconds in showtime : 0

```

```

Logical interface at-5/0/0.0 (Index 70) (SNMP ifIndex 71)
  Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000
  Encapsulation: Ether-over-ATM-LLC
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 1500
  Flags: None
  VCI 0.128
  Flags: Active, Multicast
  Total down time: 0 sec, Last down: Never
  Input packets : 0
  Output packets: 0

```

```

Logical interface at-5/0/0.32767 (Index 71) (SNMP ifIndex 70)
  Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Input packets : 0
  Output packets: 0
  VCI 0.4
  Flags: Active
  Total down time: 0 sec, Last down: Never
  Input packets : 0
  Output packets: 0

```

**show interfaces brief
(ATM-over-ADSL)**

```

user@host> show interfaces at-5/0/0 brief
Physical interface: at-5/0/0, Enabled, Physical link is Down
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
Speed: ADSL2+, Loopback: None
Device flags   : Present Running Down
Link flags     : None
Logical interface at-5/0/0.0
  Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000
  Encapsulation: Ether-over-ATM-LLC
  inet
  VCI 0.128
  Flags: Active, Multicast
  Total down time: 0 sec, Last down: Never

Logical interface at-5/0/0.32767
  Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  VCI 0.4

```

Flags: Active
Total down time: 0 sec, Last down: Never

**show interfaces detail
(ATM-over-ADSL)**

```

user@host> show interfaces at-5/0/0 detail
Physical interface: at-5/0/0, Enabled, Physical link is Down
Interface index: 149, SNMP ifIndex: 68, Generation: 30
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
Speed: ADSL2+, Loopback: None
Device flags   : Present Running Down
Link flags     : None
CoS queues     : 8 supported, 8 in use
Hold-times    : Up 0 ms, Down 0 ms
Current address: 00:05:85:c3:85:84
Last flapped   : 2005-12-19 15:36:02 PST (12w0d 18:33 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes   :                0                0 bps
  Output bytes  :                0                0 bps
  Input packets :                0                0 pps
  Output packets:               0                0 pps
Queue counters:      Queued packets  Transmitted packets  Dropped packets

  0 best-effort      0                0                0
  1 expedited-fo     0                0                0
  2 assured-forw     0                0                0
  3 network-cont     0                0                0
  4 be-class         0                0                0
  5 ef-class         0                0                0
  6 af-class         0                0                0

ADSL alarms   : None
ADSL defects  : None
ADSL status:
  Modem status : Training
  DSL mode      : Adsl2plus  Annex A
  Last fail code: ATU-C not detected
  Subfunction   : 0x00
  Seconds in showtime : 0
ADSL Statistics:
  Attenuation (dB) :                0.0                0.0
  Capacity used (%) :                0                0
  Noise margin (dB) :                0.0                0.0
  Output power (dBm) :               0.0                0.0

  Interleave      Fast  Interleave      Fast
  Bit rate (kbps) :      0      0      0      0
  CRC              :      0      0      0      0
  FEC              :      0      0      0      0
  HEC              :      0      0      0      0
  Received cells   :      0      0
  Transmitted cells :      0      0

Logical interface at-5/0/0.0 (Index 70) (SNMP ifIndex 71) (Generation 8)
Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000
Encapsulation: Ether-over-ATM-LLC

```

```

Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Transit statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Protocol inet, MTU: 1500, Generation: 12, Route table: 0
  Flags: None
VCI 0.128
  Flags: Active, Multicast
  Total down time: 0 sec, Last down: Never
  ATM per-VC transmit statistics:
  Tail queue packet drops: 0
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0

```

```

Logical interface at-5/0/0.32767 (Index 71) (SNMP ifIndex 70) (Generation 9)
  Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
  Local statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
  VCI 0.4
    Flags: Active
    Total down time: 0 sec, Last down: Never
    ATM per-VC transmit statistics:
    Tail queue packet drops: 0
    Traffic statistics:
      Input bytes : 0
      Output bytes : 0
      Input packets: 0
      Output packets: 0

```

```

show interfaces      user@host> show interfaces at-5/0/0 extensive
extensive           Physical interface: at-5/0/0, Enabled, Physical link is Down
(ATM-over-ADSL)    Interface index: 149, SNMP ifIndex: 68, Generation: 30
                      Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
                      Speed: ADSL2+, Loopback: None
                      Device flags   : Present Running Down
                      Link flags     : None
                      CoS queues    : 8 supported, 8 in use
                      Hold-times    : Up 0 ms, Down 0 ms

```

```

Current address: 00:05:85:c3:85:84
Last flapped   : 2005-12-19 15:36:02 PST (12w0d 18:34 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   :                0                0 bps
Output bytes  :                0                0 bps
Input packets :                0                0 pps
Output packets:                0                0 pps
Input errors:
  Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,
  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0, Resource
errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
  Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort      0                0                0
  1 expedited-fo     0                0                0
  2 assured-forw     0                0                0
  3 network-cont     0                0                0
  4 be-class         0                0                0
  5 ef-class         0                0                0
  6 af-class         0                0                0

ADSL alarms   : None
ADSL defects  : None
ADSL media:
Seconds      Count  State
LOF          0      0 OK
LOS          0      0 OK
LOM          0      0 OK
LOP          0      0 OK
LOC DI       0      0 OK
LOC DNI      0      0 OK
ADSL status:
Modem status  : Training
DSL mode      : Adsl2plus Annex A
Last fail code: ATU-C not detected
Subfunction   : 0x00
Seconds in showtime : 0
ADSL Statistics:
ATU-R      ATU-C
Attenuation (dB) :      0.0      0.0
Capacity used (%) :      0       0
Noise margin (dB) :      0.0     0.0
Output power (dBm) :      0.0     0.0

Interleave  Fast  Interleave  Fast
Bit rate (kbps) :      0      0      0      0
CRC             :      0      0      0      0
FEC             :      0      0      0      0
HEC             :      0      0      0      0
Received cells  :      0      0
Transmitted cells :      0      0
ATM status:
HCS state:      Hunt

```

```

LOC      :      OK
ATM Statistics:
  Uncorrectable HCS errors: 0, Correctable HCS errors: 0,
  Tx cell FIFO overruns: 0, Rx cell FIFO overruns: 0,
  Rx cell FIFO underruns: 0, Input cell count: 0, Output cell count: 0,
  Output idle cell count: 0, Output VC queue drops: 0, Input no buffers: 0,
  Input length errors: 0, Input timeouts: 0, Input invalid VCs: 0,
  Input bad CRCs: 0, Input OAM cell no buffers: 0

```

Packet Forwarding Engine configuration:

Destination slot: 5

| CoS transmit queue | % | Bandwidth bps | % | Buffer usec | Priority | Limit |
|--------------------|----|------------------|----|----------------|----------|-------|
| 0 best-effort | 95 | 7600000 | 95 | 0 | low | none |
| 3 network-control | 5 | 400000 | 5 | 0 | low | none |

Logical interface at-5/0/0.0 (Index 70) (SNMP ifIndex 71) (Generation 8)

Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000

Encapsulation: Ether-over-ATM-LLC

Traffic statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

Local statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

Transit statistics:

```

Input bytes :      0      0 bps
Output bytes :      0      0 bps
Input packets:      0      0 pps
Output packets:     0      0 pps

```

Protocol inet, MTU: 1500, Generation: 12, Route table: 0

Flags: None

VCI 0.128

Flags: Active, Multicast

Total down time: 0 sec, Last down: Never

ATM per-VC transmit statistics:

Tail queue packet drops: 0

Traffic statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

Logical interface at-5/0/0.32767 (Index 71) (SNMP ifIndex 70) (Generation 9)

Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000

Encapsulation: ATM-VCMUX

Traffic statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

Local statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

VCI 0.4

Flags: Active

Total down time: 0 sec, Last down: Never


```
ATM per-VC transmit statistics:
  Tail queue packet drops: 0
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
```

show interfaces (ATM-over-SHDSL)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>at-pim/0/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform) Display status information about the specified ATM-over-symmetric high-speed DSL (SHDSL) interface. |
| Options | <p><i>at-pim/0/port</i>—Display standard information about the specified SHDSL interface</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display the SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ATM-over-SHDSL) on page 440</p> <p>show interfaces brief (ATM-over-SHDSL) on page 441</p> <p>show interfaces detail (ATM-over-SHDSL) on page 441</p> <p>show interfaces extensive (ATM-over-SHDSL) on page 443</p> |
| Output Fields | Table 85 on page 439 lists only output fields that are specific to the show interfaces (ATM-over-SHDSL) command. For information about all other output fields, see Table 83 on page 398. |

Table 85: ATM-over-SHDSL show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------|--|-----------------------|
| SHDSL alarms | Number and type of SHDSL alarms. See "SHDSL media" for details. | detail extensive none |
| SHDSL defects | Number and type of SHDSL defects. See "SHDSL media" for details. | detail extensive none |
| SHDSL media | <p>Information about the SHDSL media-specific defects that can prevent the interface from passing packets. The following information is displayed for each defect:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. A state other than OK indicates a problem. <p>The possible defects are as follows:</p> <ul style="list-style-type: none"> ■ LOSD—Loss of signal was detected at the remote application interface. ■ LOSW—Loss of sync word. A message ID was sent. ■ ES—Errored seconds. One or more cyclic redundancy check (CRC) anomalies were detected. ■ SES—Severely errored seconds. At least 50 CRC anomalies were detected. ■ UAS—Unavailable seconds. An interval occurred during which one or more LOSW defects were detected. | extensive |
| SHDSL status | <p>Operational information for ATM-over-SHDSL interfaces.</p> <ul style="list-style-type: none"> ■ Line termination—SHDSL transceiver unit- remote (STU-R) (Only customer premises equipment is supported.) ■ Annex—Either Annex A or Annex B. Annex A is supported in North America, and Annex B is supported in Europe. ■ Line mode—SHDSL mode configured on the G.SHDSL Physical Interface Module (PIM), either 2-wire or 4-wire. ■ Modem status—Data. ■ Bit rate (kbps)—Speed of data transfer on the ATM-over-G.SHDSL interface, in kilobits per second. ■ Last fail mode—Code for the last interface failure. ■ Framers mode—Framers mode of the underlying interface: ATM. ■ Dying gasp —Ability of a J-series router that has lost power to send a message informing the attached DSL access multiplexer (DSLAM) that it is about to go offline: Enabled or Disabled. ■ Framers sync status—Framers synchronization status: In sync or Out of sync (OOS). ■ Chipset version—Version number of the chipset on the interface. ■ Firmware version—Version number of the firmware on the interface. | detail extensive none |

Table 85: ATM-over-SHDSL show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------|--|------------------|
| SHDSL statistics | <ul style="list-style-type: none"> ■ Loop Attenuation (dB)—Attenuation in decibels. ■ Transmit power (dBm)—Power of the transmitting interface. ■ Receiver gain (db)—Power increase of the receiving interface, in decibels. ■ SNR sampling (dB)—Signal-to-noise ratio at a receiver point, in decibels. ■ CRC errors—Number of cyclic redundancy check errors. ■ SEGA errors—Number of segment anomaly errors. A regenerator operating on a segment received corrupted data. ■ LOSW errors—Number of loss of signal defect errors. Three or more consecutively received frames contained one or more errors in the framing bits. ■ Received cells—Number of cells received through the interface. ■ Transmitted cells—Number of cells sent through the interface. ■ HEC errors—Number of header error checksum errors. ■ Cell Drop—Number of dropped cells on the interface. | detail extensive |

```

show interfaces      user@host> show interfaces at-4/0/0
(ATM-over-SHDSL)    Physical interface: at-4/0/0, Enabled, Physical link is Down
                        Interface index: 141, SNMP ifIndex: 41
                        Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
                        Speed: SHDSL(2-wire), Loopback: None
                        Device flags   : Present Running Down
                        Link flags     : None
                        CoS queues    : 8 supported, 8 in use
                        Current address: 00:05:85:c2:44:60
                        Last flapped   : 2006-03-21 15:07:11 PST (2w0d 00:59 ago)
                        Input rate     : 0 bps (0 pps)
                        Output rate    : 0 bps (0 pps)
                        SHDSL alarms   : LOSD
                        SHDSL defects  : LOSD
                        SHDSL status:
                          Line termination : STU-R
                          Annex            : Unknown
                          Line mode        : 2-wire
                          Modem status     : Training
                          Bit rate (kbps)  : 0
                          Last fail mode   : No failure (0x00)
                          Frammer mode     : ATM
                          Dying gasp      : Enabled
                          Frammer sync status : Out of sync
                          Chipset version  : 00
                          Firmware version : R3.0.1

                        Logical interface at-4/0/0.0 (Index 68) (SNMP ifIndex 44)
                          Flags: Device-Down Point-To-Point SNMP-Traps 0x4000
                          Encapsulation: Ether-over-ATM-LLC
                        Input packets : 0
                        Output packets: 0
                          Protocol inet, MTU: 1500
                          Flags: None
                        VCI 0.128
                          Flags: Active

```

```

    Total down time: 0 sec, Last down: Never
    Input packets : 0
    Output packets: 0
Logical interface at-4/0/0.32767 (Index 69) (SNMP ifIndex 43)
    Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
    Encapsulation: ATM-VCMUX
Input packets : 0
Output packets: 0
    VCI 0.4
    Flags: Active
    Total down time: 0 sec, Last down: Never
    Input packets : 0
    Output packets: 0

```

**show interfaces brief
(ATM-over-SHDSL)**

```

user@host> show interfaces at-4/0/0 brief
Physical interface: at-4/0/0, Enabled, Physical link is Down
Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
Speed: SHDSL(2-wire), Loopback: None
Device flags   : Present Running Down
Link flags     : None

Logical interface at-4/0/0.0
    Flags: Device-Down Point-To-Point SNMP-Traps 0x4000
    Encapsulation: Ether-over-ATM-LLC
    inet
    VCI 0.128
    Flags: Active
    Total down time: 0 sec, Last down: Never

Logical interface at-4/0/0.32767
    Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
    Encapsulation: ATM-VCMUX
    VCI 0.4
    Flags: Active
    Total down time: 0 sec, Last down: Never

```

**show interfaces detail
(ATM-over-SHDSL)**

```

user@host> show interfaces at-4/0/0 detail
Physical interface: at-4/0/0, Enabled, Physical link is Down
Interface index: 141, SNMP ifIndex: 41, Generation: 22
Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
Speed: SHDSL(2-wire), Loopback: None
Device flags   : Present Running Down
Link flags     : None
CoS queues     : 8 supported, 8 in use
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:c2:44:60
Last flapped   : 2006-03-21 15:07:11 PST (2w0d 01:00 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Queue counters:

```

| | Queued packets | Transmitted packets | Dropped packets |
|----------------|----------------|---------------------|-----------------|
| 0 best-effort | 0 | 0 | 0 |
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |

```

3 network-cont                                0                                0                                0

SHDSL alarms : LOSD
SHDSL defects : LOSD
SHDSL status:
  Line termination : STU-R
  Annex            : Unknown
  Line mode        : 2-wire
  Modem status     : Training
  Bit rate (kbps)  : 0
  Last fail mode   : No failure (0x00)
  Framers mode     : ATM
  Dying gasp       : Enabled
  Framers sync status : Out of sync
  Chipset version  : 00
  Firmware version : R3.0.1
SHDSL statistics:
  Loop attenuation (dB) : 2.3
  Transmit power (dBm) : 0.0
  Receiver gain (dB)   : 20.412
  CRC errors           : 0
  SEGA errors          : 0
  LOSW errors          : 0
  Received cells       : 0
  Transmitted cells    : 0
  HEC errors           : 0
  Cell drop            : 0

Logical interface at-4/0/0.0 (Index 68) (SNMP ifIndex 44) (Generation 8)
Flags: Device-Down Point-To-Point SNMP-Traps 0x4000
Encapsulation: Ether-over-ATM-LLC
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Transit statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Protocol inet, MTU: 1500, Generation: 11, Route table: 0
Flags: None
VCI 0.128
Flags: Active
Total down time: 0 sec, Last down: Never
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0

Logical interface at-4/0/0.32767 (Index 69) (SNMP ifIndex 43) (Generation 9)
Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000

```

```

Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
VCI 0.4
  Flags: Active
  Total down time: 0 sec, Last down: Never
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0

```

**show interfaces
extensive
(ATM-over-SHDSL)**

```

user@host> show interfaces at-4/0/0 extensive
Physical interface: at-4/0/0, Enabled, Physical link is Down
Interface index: 141, SNMP ifIndex: 41, Generation: 22
Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
Speed: SHDSL(2-wire), Loopback: None
Device flags : Present Running Down
Link flags : None
CoS queues : 8 supported, 8 in use
Hold-times : Up 0 ms, Down 0 ms
Current address: 00:05:85:c2:44:60
Last flapped : 2006-03-21 15:07:11 PST (2w0d 01:02 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Input errors:
  Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
  Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

  Resource errors: 0
Queue counters:
  Queued packets  Transmitted packets  Dropped packets

  0 best-effort 0 0 0
  1 expedited-fo 0 0 0
  2 assured-forw 0 0 0
  3 network-cont 0 0 0

SHDSL alarms : LOSD
SHDSL defects : LOSD
SHDSL media: Seconds Count State

```

```

      LOSD                1228405          1 Defect Active
      LOSW                0              0 OK
      ES                  0
      SES                  0
      UAS                1228402
SHDSL status:
  Line termination       : STU-R
  Annex                  : Unknown
  Line mode              : 2-wire
  Modem status           : Training
  Bit rate (kbps)        : 0
  Last fail mode         : No failure (0x00)
  Frammer mode           : ATM
  Dying gasp             : Enabled
  Frammer sync status    : Out of sync
  Chipset version        : 00
  Firmware version       : R3.0.1
SHDSL statistics:
  Loop attenuation (dB)  : 2.3
  Transmit power (dBm)   : 0.0
  Receiver gain (dB)     : 20.412
  CRC errors             : 0
  SEGA errors            : 0
  LOSW errors            : 0
  Received cells         : 0
  Transmitted cells      : 0
  HEC errors             : 0
  Cell drop              : 0
Packet Forwarding Engine configuration:
  Destination slot: 4
  CoS transmit queue      Bandwidth      Buffer      Priority  Limit
                        %      bps      %      usec
  0 best-effort           95      2196400  95      0        low  none
  3 network-control       5       115600   5      0        low  none

Logical interface at-4/0/0.0 (Index 68) (SNMP ifIndex 44) (Generation 8)
Flags: Device-Down Point-To-Point SNMP-Traps 0x4000
Encapsulation: Ether-over-ATM-LLC
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Local statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
Transit statistics:
  Input bytes : 0 0 bps
  Output bytes : 0 0 bps
  Input packets: 0 0 pps
  Output packets: 0 0 pps
Protocol inet, MTU: 1500, Generation: 11, Route table: 0
  Flags: None
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:

```



```

      Input bytes :                0
      Output bytes :               0
      Input packets:               0
      Output packets:              0

Logical interface at-4/0/0.32767 (Index 69) (SNMP ifIndex 43) (Generation 9)
Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes :                   0
  Output bytes :                   0
  Input packets:                   0
  Output packets:                  0
Local statistics:
  Input bytes :                   0
  Output bytes :                   0
  Input packets:                   0
  Output packets:                  0
VCI 0.4
Flags: Active
Total down time: 0 sec, Last down: Never
ATM per-VC transmit statistics:
  Tail queue packet drops: 0
Traffic statistics:
  Input bytes :                   0
  Output bytes :                   0
  Input packets:                   0
  Output packets:                  0

```


Chapter 13

ILMI Interface Operational Mode Commands

Table 86 on page 447 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Integrated Local Management Interface (ILMI) operations on ATM1 and ATM2 intelligent queuing (IQ) interfaces. Commands are listed in alphabetical order.

Table 86: ILMI Operational Mode Commands

| Task | Command |
|--------------------------------------|-----------------------|
| Clear (set to zero) ILMI statistics. | clear ilmi statistics |
| Display ILMI messages. | show ilmi |
| Display ILMI statistics. | show ilmi statistics |

clear ilmi statistics

| | |
|---------------------------------|---|
| Syntax | clear ilmi statistics |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Set Integrated Local Management Interface (ILMI) statistics to zero. |
| Options | This command has no options. |
| Required Privilege Level | clear |
| Related Topics | show ilmi statistics |
| List of Sample Output | clear ilmi statistics on page 448 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear ilmi statistics | user@host> clear ilmi statistics |

show ilmi

| | |
|---------------------------------|--|
| Syntax | show ilmi <all interface <i>interface-name</i> > |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display Integrated Local Management Interface (ILMI) information. |
| Options | none—Display information for all ILMI-enabled ATM devices. all interface <i>interface-name</i> —(Optional) Display IP addresses and port names for all ILMI-enabled ATM devices or for a particular device. |
| Required Privilege Level | view |
| List of Sample Output | show ilmi all on page 449 show ilmi interface on page 449 |
| Output Fields | Table 87 on page 449 lists the output fields for the show ilmi command. Output fields are listed in the approximate order in which they appear. |

Table 87: show ilmi Output Fields

| Field Name | Field Description |
|---------------------|----------------------------------|
| Physical interface | Name of the physical interface. |
| VCI | Virtual connection identifier. |
| Peer IP address | IP address of the peer. |
| Peer interface name | Port interface name of the peer. |

| | |
|----------------------------|---|
| show ilmi all | <pre> user@host> show ilmi all Physical interface: at-6/2/1, VCI: 0.16 Peer IP address: 192.168.4.24, Peer interface name: 1C4 Physical interface: at-6/3/0, VCI: 0.16 Peer IP address: 192.168.7.6, Peer interface name: 2C3 Physical interface: at-6/4/0, VCI: 0.16 Peer IP address: 192.168.9.10, Peer interface name: 1C2 </pre> |
| show ilmi interface | <pre> user@host> show ilmi interface at-6/2/1 Physical interface: at-6/2/1, VCI: 0.16 Peer IP address: 192.168.4.24, Peer interface name: 1C4 </pre> |

show ilmi statistics

| | |
|---------------------------------|---|
| Syntax | show ilmi statistics |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display input and output Integrated Local Management Interface (ILMI) statistics. |
| Options | This command has no options. |
| Required Privilege Level | view |
| Related Topics | clear ilmi statistics |
| List of Sample Output | show ilmi statistics on page 452 |
| Output Fields | Table 88 on page 451 lists the output fields for the <code>show ilmi statistics</code> command. Output fields are listed in the approximate order in which they appear. |

Table 88: show ilmi statistics Output Fields

| Field Name | Field Description |
|------------|--|
| Input | <p>Information about received ILMI packets:</p> <ul style="list-style-type: none"> ■ Packets—Total number of messages delivered to the ILMI entity from the transport service. ■ Bad versions—Total number of messages delivered to the ILMI entity that were for an unsupported ILMI version. ■ Bad community names—Total number of messages delivered to the ILMI entity that did not use an ILMI community name. ■ Bad community uses—Total number of messages delivered to the ILMI entity that represented an ILMI operation that was not allowed by the ILMI community named in the message. ■ ASN parse errors—Total number of ASN.1 or BER errors encountered by the ILMI entity when decoding received ILMI messages. ■ Too bigs—Total number of ILMI packets delivered to the ILMI entity with an error status field of tooBig. ■ No such names—Total number of ILMI packets delivered to the ILMI entity with an error status field of noSuchName. ■ Bad values—Total number of ILMI packets delivered to the ILMI entity with an error status field of badValue. ■ Read onlys—Total number of valid ILMI packets delivered to the ILMI entity with an error status field of readOnly. Only incorrect implementations of ILMI generate this error. ■ General errors—Total number of ILMI packets delivered to the ILMI entity with an error status field of genErr. ■ Total request varbinds—Total number of objects retrieved successfully by the ILMI entity as a result of receiving valid ILMI GetRequest and GetNext packets. ■ Total set varbinds—Total number of objects modified successfully by the ILMI entity as a result of receiving valid ILMI SetRequest packets. ■ Get requests—Total number of ILMI GetRequest packets that have been accepted and processed by the ILMI entity. ■ Get nexts—Total number of ILMI GetNext packets that have been accepted and processed by the ILMI entity. ■ Set requests—Total number of ILMI SetRequest packets that have been accepted and processed by the ILMI entity. ■ Get responses—Total number of ILMI GetResponse packets that have been accepted and processed by the ILMI entity. ■ Traps—Total number of ILMI traps received by the ILMI entity. ■ Silent drops—Total number of GetRequest, GetNextRequest, GetBulkRequest, SetRequest, and InformRequest packets delivered to the ILMI entity that were silently dropped because the size of a reply containing an alternate response packet with an empty variable-bindings field was greater than either a local constraint or the maximum message size associated with the originator of the requests. ■ Proxy drops—Total number of GetRequest, GetNextRequest, GetBulkRequest, SetRequest, and InformRequest packets delivered to the ILMI entity that were silently dropped because the transmission of the (possibly translated) message to a proxy target failed in such a way (other than a timeout) that no response packet could be returned. |

Table 88: show ilmi statistics Output Fields (*continued*)

| Field Name | Field Description |
|------------|--|
| Output | <p>Information about transmitted ILMI packets:</p> <ul style="list-style-type: none"> ■ Packets—Total number of messages passed from the ILMI entity to the transport service. ■ Too bigs—Total number of ILMI packets generated by the ILMI entity with an error status field of tooBig. ■ No such names—Total number of ILMI packets generated by the ILMI entity with an error status field of noSuchName. ■ Bad values—Total number of ILMI packets generated by the ILMI entity with an error status field of badValue. ■ General errors—Total number of ILMI packets generated by the ILMI entity with an error status field of genErr. ■ Get requests—Total number of ILMI GetRequest packets that have been generated by the ILMI entity. ■ Get nexts—Total number of ILMI GetNext packets that have been generated by the ILMI entity. ■ Set requests—Total number of ILMI SetRequest packets that have been generated by the ILMI entity. ■ Get responses—Total number of ILMI GetResponse packets that have been generated by the ILMI entity. ■ Traps—Total number of ILMI traps generated by the ILMI entity. |

```

show ilmi statistics  user@host> show ilmi statistics
                        ILMI statistics:
                        Input:
                        Packets: 0, Bad versions: 0, Bad community names: 0,
                        Bad community uses: 0, ASN parse errors: 0,
                        Too bigs: 0, No such names: 0, Bad values: 0,
                        Read onlys: 0, General errors: 0,
                        Total request varbinds: 0, Total set varbinds: 0,
                        Get requests: 0, Get nexts: 0, Set requests: 0,
                        Get responses: 0, Traps: 0,
                        Silent drops: 0, Proxy drops 0
                        Output:
                        Packets: 0, Too bigs: 0, No such names: 0,
                        Bad values: 0, General errors: 0,
                        Get requests: 0, Get nexts: 0, Set requests: 0,
                        Get responses: 0, Traps: 0

```


Part 9

ISDN Interfaces

- ISDN Interface Operational Mode Commands on page 455

Chapter 14

ISDN Interface Operational Mode Commands

Table 89 on page 455 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Integrated Services Digital Network (ISDN) interfaces. Commands are listed in alphabetical order.

Table 89: ISDN Interface Operational Mode Commands

| Task | Command |
|--|----------------------------------|
| Clear ISDN Q.921 statistics. | clear isdn q921 statistics |
| Clear ISDN Q.931 statistics. | clear isdn q931 statistics |
| Display ISDN services default software values. | show dialer defaults |
| Display ISDN dialer interface information. | show dialer interfaces |
| Display ISDN dialer pool information. | show dialer pools |
| Display ISDN B-channel interface information. | show interfaces (ISDN B-Channel) |
| Display ISDN Basic Rate Interface (BRI) information. | show interfaces (ISDN BRI) |
| Display ISDN D-channel interface information. | show interfaces (ISDN D-channel) |
| Display ISDN dialer interface information. | show interfaces (ISDN Dialer) |
| Display ISDN calls. | show isdn calls |
| Display ISDN call history. | show isdn history |
| Display Layer 2 ISDN status and statistics. | show isdn q921 statistics |
| Display Layer 3 ISDN status and statistics. | show isdn q931 statistics |
| Display ISDN status information. | show isdn status |



NOTE: ISDN is supported on the J-series routing platform only. J-series Services Routers can be configured to "fail over" to an ISDN interface when the primary connection experiences interruptions in Internet connectivity. The following interfaces support ISDN backup connectivity: E1, E3, Fast Ethernet, generic routing encapsulation (GRE), Point-to-Point Protocol over Ethernet (PPPoE), serial, T1, and T3. For information about how to configure ISDN interfaces, see the *J-series Services Router Basic LAN and WAN Access Configuration Guide* or the *JUNOS Network Interfaces Configuration Guide*.

clear isdn q921 statistics

| | |
|-----------------------------------|---|
| Syntax | clear isdn q921 statistics <br-pim/0/port> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Clear ISDN Layer 2 statistics based on the Q.921 standard. |
| Options | none—Clear ISDN Q.921 statistics for all Basic Rate Interface (BRI) interfaces. br-pim/0/port—(Optional) Clear ISDN Q.921 statistics for the specified BRI interface only. |
| Required Privilege Level | view |
| Related Topics | show isdn q921 statistics |
| List of Sample Output | clear isdn q921 statistics on page 457 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear isdn q921 statistics | user@host> clear isdn q921 statistics |

clear isdn q931 statistics

| | |
|-----------------------------------|---|
| Syntax | clear isdn q931 statistics <br-pim/0/port> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Clear ISDN Layer 3 statistics based on the Q.931 standard. |
| Options | none—Clear ISDN Q.931 statistics for all Basic Rate Interface (BRI) interfaces. br-pim/0/port—(Optional) Clear ISDN Q.931 statistics for the specified BRI interface only. |
| Required Privilege Level | view |
| Related Topics | show isdn q931 statistics |
| List of Sample Output | clear isdn q931 statistics on page 458 |
| Output Fields | When you enter this command, you are provided feedback on the status of your request. |
| clear isdn q931 statistics | user@host> clear isdn q931 statistics |

show dialer defaults

| | |
|---------------------------------|---|
| Syntax | show dialer defaults |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN services default software values. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show dialer defaults on page 460 |
| Output Fields | Table 90 on page 459 lists the output fields for the show dialer defaults command. Output fields are listed in the approximate order in which they appear. |

Table 90: show dialer defaults Output Fields

| Field Name | Field Description |
|---------------------------------------|---|
| Idle timeout | Length of time (in seconds) that a connection can be idle before disconnecting. |
| Activation delay | Length of time (in seconds) to wait before enabling the interface after the primary interface has failed. |
| Deactivation delay | Length of time (in seconds) to wait before disabling the interface after the primary interface is operational. |
| Dialer watch initial route check time | Length of time (in seconds) before a route is checked for status. |
| Dialer pool priority | Priority of the dialer interface. |
| Dialer load threshold | Bandwidth threshold percentage used for adding interfaces. Another link is added to the multilink bundle when the bandwidth reaches the threshold value you set. The range of values is 0 through 100. When the value is set to 0, all available channels are dialed. The default value is 100. |
| Dialer load interval | Interval used to calculate the average load on the network. The range of values, in seconds, is 20 through 180, configurable in intervals of 10 seconds. The default value is 60. |
| Dialer redial delay | Delay, in seconds, between two successive calls made by the dialer (for dialout). The default value is 3 seconds. |
| Dialer callback wait period | For interfaces configured for ISDN with callback, the amount of time the dialer waits before calling back the caller. The default value is 5 seconds. |

```
show dialer defaults  user@host> show dialer defaults  
Dialer services related defaults :  
  Idle timeout: 120 seconds  
  Activation delay: 0 seconds  
  Deactivation delay: 0 seconds  
  Dialer watch initial route check time: 120 seconds  
  Dialer pool priority: 0 seconds  
  Dialer load threshold: 100%  
  Dialer load interval: 60 seconds  
  Dialer redial delay: 3 seconds  
  Dialer callback wait period : 5 seconds
```


show dialer interfaces

| | |
|---------------------------------|--|
| Syntax | show dialer interfaces <brief detail> <dlnumber> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN dialer interface information. |
| Options | none—(Same as detail) Display detailed information about all ISDN dialer interfaces. brief detail—(Optional) Display the specified level of output. dlnumber—(Optional) Display information about the specified dialer interface only. |
| Required Privilege Level | view |
| List of Sample Output | show dialer interfaces on page 462 show dialer interfaces brief on page 462 show dialer interfaces detail on page 462 |
| Output Fields | Table 91 on page 461 lists the output fields for the show dialer interfaces command. Output fields are listed in the approximate order in which they appear. |

Table 91: show dialer interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------|
| Interface-name | Dialer interface name. | All levels |
| State | State of the interface: Active or Inactive | All levels |
| Dial pool | Dial pool name. | All levels |
| Dial strings | Dialing number for the ISDN connection. | detail none |
| Subordinate interfaces | Associated B-channel or USB modem interface name and SNMP index number. | All levels |
| Activation delay | Length of time (in seconds) to wait before enabling the interface after the primary interface has failed. | detail none |
| Deactivation delay | Length of time (in seconds) to wait before disabling the interface after the primary interface is operational. | detail none |
| Initial route check delay | Wait period (in seconds) for the software to check if the primary interface is up after the router comes up. The range is from 1 through 300 seconds. The default is 120 seconds. | detail none |
| Redial delay | (Available on interfaces configured for ISDN dial-out.) Delay, in seconds, between two successive calls made. The range is from 2 to 255. The default value is 3. | detail none |

Table 91: show dialer interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------|
| Callback wait period | Time, in seconds, that the dialer waits before it calls back the caller ID. The default value is 5. | detail none |
| Load threshold | Bandwidth threshold percentage used for adding interfaces. Another link is added to the multilink bundle when the load reaches the threshold value you set. The range of values is from 0 to 100. The default value is 100. | detail none |
| Load interval | Interval used to calculate the average load on the network. By default, the average interface load is calculated every 60 seconds. | detail none |

show dialer interfaces user@host> **show dialer interfaces**
d10.0
State: Active
Dial Pool: 10
Dial strings: 5551212
Subordinate interfaces: bc-4/0/0:1 (Index 151)
Activation delay: 0, Deactivation delay: 0
Initial route check delay: 120
Redial delay: 3
Callback wait period: 5
Load threshold: 0, Load interval: 60

show dialer interfaces user@host> **show dialer interfaces brief**
brief d10.0
State: Active
Dial Pool: 10
Subordinate interfaces: bc-4/0/0:1

show dialer interfaces The output for the **show dialer interfaces detail** command is identical to that for the
detail **show dialer interfaces** command. For sample output, see **show dialer interfaces** on page 462.

show dialer pools

| | |
|---------------------------------|---|
| Syntax | show dialer pools <brief detail> <pool-name> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display dialer pool information. The dialer pool provides a group of dialing options for ISDN interfaces. |
| Options | none—(Same as detail) Display detailed information about all ISDN dialer pools. brief detail—(Optional) Display the specified level of output. pool-name—(Optional) Display information about the specified dialer pool only. |
| Required Privilege Level | view |
| List of Sample Output | show dialer pools on page 464 show dialer pools brief on page 464 show dialer pools detail on page 464 |
| Output Fields | Table 92 on page 463 lists the output fields for the show dialer pools command. Output fields are listed in the approximate order in which they appear. |

Table 92: show dialer pools Output Fields

| Field Name | Field Description | Level of Output |
|-------------------------------|--|-----------------|
| Pool | Name of the dialer pool. | All levels |
| Dialer Interfaces | | |
| Name | Name of configured dialer interfaces. | All levels |
| State | Status of the dialer interface: Active or Inactive | All levels |
| Subordinate Interfaces | | |
| Name | Name of each physical ISDN interface configured as part of the dialer interface. | All levels |
| Flags | Status of the physical B-channel interface. | All levels |
| Priority | Priority of the interface. | All levels |

show dialer pools

```

user@host> show dialer pools
Pool: 10
Dialer interfaces:      Name      State
                        d10.0     Active
Subordinate interfaces: Name      Flags      Priority
                        bc-4/0/0:1  Active     0
                        bc-4/0/0:2  Inactive   0

```

show dialer pools brief

```

user@host> show dialer pools brief
Pool      Dialer interface      Subordinate interface
Name      State                  Name      Flags      Priority
10         d10.0 Active                bc-4/0/0:1 Active     0
                        bc-4/0/0:2 Inactive   0

```

show dialer pools detail The output for the show dialer pools detail command is identical to that for the show dialer pools command. For sample output, see **show dialer pools** on page 464.

show interfaces (ISDN B-Channel)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>bc-pim/0/port:channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display information about the specified ISDN B-channel interface. |
| Options | <p><i>bc-pim/0/port:channel</i>—Display standard information about the specified ISDN B-channel interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display the interface description string.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Additional Information | There are no user-configurable fields on B-channel interfaces. |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ISDN B-Channel) on page 468</p> <p>show interfaces brief (ISDN B-Channel) on page 469</p> <p>show interfaces detail (ISDN B-Channel) on page 469</p> <p>show interfaces extensive (ISDN B-Channel) on page 469</p> |
| Output Fields | Table 93 on page 465 lists the output fields for the show interfaces (ISDN B-channel) command. Output fields are listed in the approximate order in which they appear. |

Table 93: ISDN B-Channel show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|--------------------|--|-----------------------|
| Physical Interface | Name of the physical interface type. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 93: ISDN B-Channel show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | Maximum transmission unit (MTU)—Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Parent | Name and interface index of the interface to which a particular child interface belongs. None indicates that this is the top level. | detail extensive none |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured media access control (MAC) address. | detail extensive |
| Hardware address | MAC address of the hardware. | detail extensive |
| Alternate link address | Backup address of the link. | detail extensive |
| CoS queues | Number of class-of-service (CoS) queues configured. | detail extensive none |
| Last flapped | Date, time, and length of time since the interface changed its status from down to up. | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | none specified |
| Output rate | Output rate in bps and pps. | none specified |
| Statistics last cleared | Time when the interface statistics were last set to zero. | detail extensive |

Table 93: ISDN B-Channel show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|---|------------------|
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the logical and physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed discards—Frames that the incoming packet match code discarded because they were not recognized or were not of interest. Usually, this field reports protocols that the JUNOS software does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |

Table 93: ISDN B-Channel show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—Queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth</i> %—Percentage of bandwidth allocated to the queue. ■ Bandwidth <i>bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer</i> %—Percentage of buffer space allocated to the queue. ■ Buffer <i>usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: <i>low</i> or <i>high</i>. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are <i>none</i> and <i>exact</i>. If <i>exact</i> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <i>none</i> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface (which reflects its initialization sequence). | detail extensive none |
| SNMP ifIndex | SNMP interface index number for the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |

```

show interfaces (ISDN B-Channel)  user@host> show interfaces bc-4/0/0:1
Physical interface: bc-4/0/0:1, Enabled, Physical link is Up
Interface index: 151, SNMP ifIndex: 75
Type: Serial, Link-level type: 57, MTU: 4092, Clocking: Internal,
Speed: 64kbps,
Parent: br-4/0/0 Interface index 129
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link type      : Full-Duplex
Link flags     : None
CoS queues     : 8 supported, 8 maximum usable queues
Last flapped   : 2006-06-13 19:50:38 PDT (14:39:03 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)

Logical interface bc-4/0/0:1.0 (Index 74) (SNMP ifIndex 79)
Flags: Point-To-Point SNMP-Traps Encapsulation: 64

```



```

show interfaces brief      user@host> show interfaces bc-4/0/0:1 brief
  (ISDN B-Channel)          Physical interface: bc-4/0/0:1, Enabled, Physical link is Up
                              Type: Serial, Link-level type: 57, MTU: 4092, Clocking: Internal,
                              Speed: 64kbps
                              Device flags   : Present Running
                              Interface flags: SNMP-Traps Internal: 0x4000

                              Logical interface bc-4/0/0:1.0
                              Flags: Point-To-Point SNMP-Traps Encapsulation: 64

show interfaces detail    user@host> show interfaces bc-4/0/0:1 detail
  (ISDN B-Channel)          Physical interface: bc-4/0/0:1, Enabled, Physical link is Up
                              Interface index: 151, SNMP ifIndex: 75, Generation: 152
                              Type: Serial, Link-level type: 57, MTU: 4092, Clocking: Internal,
                              Speed: 64kbps,
                              Parent: br-4/0/0 Interface index 129
                              Device flags   : Present Running
                              Interface flags: SNMP-Traps Internal: 0x4000
                              Link type      : Full-Duplex
                              Link flags     : None
                              Physical info  : Unspecified
                              Hold-times     : Up 0 ms, Down 0 ms
                              Current address: Unspecified, Hardware address: Unspecified
                              Alternate link address: Unspecified
                              CoS queues     : 8 supported, 8 maximum usable queues
                              Last flapped   : 2006-06-13 19:50:38 PDT (14:39:06 ago)
                              Statistics last cleared: Never
                              Traffic statistics:
                                Input bytes  :          4096          0 bps
                                Output bytes :        128423         96 bps
                                Input packets:             0          0 pps
                                Output packets:          9801         0 pps
                              Egress queues: 8 supported, 8 in use
                              Queue counters:
                                Queued packets  Transmitted packets  Dropped packets

                                0 best-effort          13              13              0
                                1 expedited-fo          0              0              0
                                2 assured-forw          0              0              0
                                3 network-cont        9788             9788             0

                              Logical interface bc-4/0/0:1.0 (Index 74) (SNMP ifIndex 79) (Generation 140)
                              Flags: Point-To-Point SNMP-Traps Encapsulation: 64

show interfaces          user@host> show interfaces bc-4/0/0:1 extensive
  extensive              Physical interface: bc-4/0/0:1, Enabled, Physical link is Up
  (ISDN B-Channel)          Interface index: 151, SNMP ifIndex: 75, Generation: 152
                              Type: Serial, Link-level type: 57, MTU: 4092, Clocking: Internal,
                              Speed: 64kbps,
                              Parent: br-4/0/0 Interface index 129
                              Device flags   : Present Running
                              Interface flags: SNMP-Traps Internal: 0x4000
                              Link type      : Full-Duplex
                              Link flags     : None
                              Physical info  : Unspecified
                              Hold-times     : Up 0 ms, Down 0 ms
                              Current address: Unspecified, Hardware address: Unspecified
                              Alternate link address: Unspecified

```

```

CoS queues      : 8 supported, 8 maximum usable queues
Last flapped   : 2006-06-13 19:50:38 PDT (14:39:12 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :           4096           0 bps
Output bytes :        128423           0 bps
Input packets:           0           0 pps
Output packets:        9801           0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 4, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0
Egress queues: 8 supported, 8 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort           13             13             0
  1 expedited-fo           0             0             0
  2 assured-forw           0             0             0
  3 network-cont        9788           9788             0

Packet Forwarding Engine configuration:
Destination slot: 4, PLP byte: 1 (0x00)
CoS transmit queue      Bandwidth      Buffer      Priority  Limit
                        %      bps      %      usec
  0 best-effort          95      60800  95      0      low  none
  3 network-control      5       3200   5       0      low  none
Logical interface bc-4/0/0:1.0 (Index 74) (SNMP ifIndex 79) (Generation 140)
Flags: Point-To-Point SNMP-Traps Encapsulation: 64

```

show interfaces (ISDN BRI)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>br-pim/0/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display status information about the specified ISDN Basic Rate Interface (BRI) interface. |
| Options | <p><i>br-pim/0/port</i>—Display standard information about the specified ISDN BRI interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display the interface description string.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ISDN BRI) on page 473</p> <p>show interfaces brief (ISDN BRI) on page 474</p> <p>show interfaces detail (ISDN BRI) on page 474</p> <p>show interfaces extensive (ISDN BRI) on page 474</p> |
| Output Fields | Table 94 on page 471 lists the output fields for the show interfaces (ISDN BRI) command. Output fields are listed in the approximate order in which they appear. |

Table 94: ISDN BRI show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|--------------------|--|-----------------------|
| Physical Interface | Name of the physical interface type. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number that reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |

Table 94: ISDN BRI show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| Link-level type | Encapsulation type used on the physical interface. | All levels |
| MTU | Maximum transmission unit (MTU)—Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Parent | Name and interface index of the interface to which a particular child interface belongs. None indicates that this is the top level. | detail extensive none |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive none |
| Physical info | Information about the physical interface. | detail extensive none |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | Media access control (MAC) address of the interface. | detail extensive |
| Alternate link address | Backup link address. | detail extensive |
| Last flapped | Date, time, and length of time since the interface changed its status from down to up. | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | none specified |
| Output rate | Output rate in bps and pps. | none specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the logical and physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 94: ISDN BRI show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------|---|-----------------|
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed discards—Frames that the incoming packet match code discarded because they were not recognized or were not of interest. Usually, this field reports protocols that the JUNOS software does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions —Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |

```

show interfaces      user@host> show interfaces br-4/0/0
(ISDN BRI)          Physical interface: br-4/0/0, Enabled, Physical link is Up
                        Interface index: 129, SNMP ifIndex: 59
                        Type: BRI, Link-level type: Controller, MTU: 4092, Clocking: 1,
                        Speed: 128kbps, Parent: None
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                        Link type      : Full-Duplex
                        Link flags     : None
                        Physical info  : S/T
                        Last flapped   : 2006-06-13 19:50:38 PDT (15:18:26 ago)
                        Input rate     : 0 bps (0 pps)
                        Output rate    : 0 bps (0 pps)

```

```

show interfaces brief      user@host> show interfaces brief br-4/0/0
(ISDN BRI)               Physical interface: br-4/0/0, Enabled, Physical link is Up
                           Type: BRI, Link-level type: Controller, MTU: 4092, Clocking: 1, Speed: 128kbps

                           Device flags   : Present Running
                           Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000

show interfaces detail    user@host> show interfaces br-4/0/0 detail
(ISDN BRI)               Physical interface: br-4/0/0, Enabled, Physical link is Up
                           Interface index: 129, SNMP ifIndex: 59, Generation: 130
                           Type: BRI, Link-level type: Controller, MTU: 4092, Clocking: 1,
                           Speed: 128kbps, Parent: None
                           Device flags   : Present Running
                           Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                           Link type      : Full-Duplex
                           Link flags    : None
                           Physical info  : S/T
                           Hold-times     : Up 0 ms, Down 0 ms
                           Last flapped   : 2006-06-13 19:50:38 PDT (15:18:32 ago)
                           Statistics last cleared: Never
                           Traffic statistics:
                           Input  bytes :                0                0 bps
                           Output bytes :                0                0 bps
                           Input  packets:                0                0 pps
                           Output packets:                0                0 pps

show interfaces           user@host> show interfaces br-4/0/0 extensive
extensive (ISDN BRI)     Physical interface: br-4/0/0, Enabled, Physical link is Up
                           Interface index: 129, SNMP ifIndex: 59, Generation: 130
                           Type: BRI, Link-level type: Controller, MTU: 4092, Clocking: 1,
                           Speed: 128kbps, Parent: None
                           Device flags   : Present Running
                           Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                           Link type      : Full-Duplex Link flags    : None
                           Physical info  : S/T
                           Hold-times     : Up 0 ms, Down 0 ms
                           Last flapped   : 2006-06-13 19:50:38 PDT (15:18:38 ago)
                           Statistics last cleared: Never
                           Traffic statistics:
                           Input  bytes :                0                0 bps
                           Output bytes :                0                0 bps
                           Input  packets:                0                0 pps
                           Output packets:                0                0 pps
                           Input errors:
                           Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
                           Policed discards: 0, Resource errors: 0
                           Output errors:
                           Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
                           Resource errors: 0

```

show interfaces (ISDN D-channel)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>dc-pim/0/port:0</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display information about the specified ISDN D-channel interface. |
| Options | <p><i>dc-pim/0/port:0</i>—Display standard information about the specified ISDN D-channel interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display the interface description string.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Additional Information | There are no user-configurable features on D-channel interfaces. |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ISDN D-Channel) on page 478</p> <p>show interfaces brief (ISDN D-Channel) on page 478</p> <p>show interfaces detail (ISDN D-Channel) on page 479</p> <p>show interfaces extensive (ISDN D-Channel) on page 479</p> |
| Output Fields | Table 95 on page 475 lists the output fields for the show interfaces (ISDN D-channel) command. Output fields are listed in the approximate order in which they appear. |

Table 95: ISDN D-Channel show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical Interface | Name of the physical interface type. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number that reflects its initialization sequence. | detail extensive none |

Table 95: ISDN D-Channel show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation type used on the physical interface. | All levels |
| MTU | Maximum transmission unit—Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Parent | Name and interface index of the interface to which a particular child interface belongs. None indicates that this is the top level. | detail extensive none |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Type of data transmission. | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive none |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | MAC address of the hardware. | detail extensive |
| Alternate link address | Backup address for the link. | detail extensive |
| Last flapped | Date, time, and length of time since the interface changed its status from down to up. | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | none specified |
| Output rate | Output rate in bps and pps. | none specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |

Table 95: ISDN D-Channel show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runt—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because they were not recognized or were not of interest. Usually, this field reports protocols that JUNOS does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions —Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC Red mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| ISDN Alarms | ISDN alarms. | All levels |
| ISDN Media | <ul style="list-style-type: none"> ■ LOF—Loss of frame ■ LOS—Loss of signal | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface (which reflects its initialization sequence). | detail extensive none |
| SNMP ifIndex | SNMP interface index number for the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |

Table 95: ISDN D-Channel show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------|--|------------------|
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the logical interface. ■ Output packets—Number of packets transmitted on the logical interface | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |

show interfaces
(ISDN D-Channel)

```
user@host> show interfaces dc-4/0/0
Physical interface: dc-4/0/0, Enabled, Physical link is Up
  Interface index: 150, SNMP ifIndex: 73
  Type: Serial, Link-level type: 55, MTU: 4092, Clocking: Internal,
  Speed: 16kbps,
  Parent: br-4/0/0 Interface index 129
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link type      : Full-Duplex
  Link flags     : None
  Last flapped   : 2006-06-13 19:50:38 PDT (15:29:32 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  ISDN alarms    : None

Logical interface dc-4/0/0.32767 (Index 73) (SNMP ifIndex 74)
  Flags: Point-To-Point SNMP-Traps Encapsulation: 60
  Input packets : 23482
  Output packets: 21686
```

show interfaces brief
(ISDN D-Channel)

```
user@host> show interfaces dc-4/0/0 brief
Physical interface: dc-4/0/0, Enabled, Physical link is Up
  Type: Serial, Link-level type: 55, MTU: 4092, Clocking: Internal,
  Speed: 16kbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  ISDN alarms    : None

Logical interface dc-4/0/0.32767
  Flags: Point-To-Point SNMP-Traps Encapsulation: 60
```

**show interfaces detail
(ISDN D-Channel)****user@host> show interfaces dc-4/0/0 detail**

Physical interface: dc-4/0/0, Enabled, Physical link is Up
 Interface index: 150, SNMP ifIndex: 73, Generation: 151
 Type: Serial, Link-level type: 55, MTU: 4092, Clocking: Internal,
 Speed: 16kbps,
 Parent: br-4/0/0 Interface index 129
 Device flags : Present Running
 Interface flags: SNMP-Traps Internal: 0x4000
 Link type : Full-Duplex
 Link flags : None
 Physical info : Unspecified
 Hold-times : Up 0 ms, Down 0 ms
 Current address: Unspecified, Hardware address: Unspecified
 Alternate link address: Unspecified
 Last flapped : 2006-06-13 19:50:38 PDT (15:29:42 ago)
 Statistics last cleared: Never
 Traffic statistics:
 Input bytes : 257592 0 bps
 Output bytes : 231162 0 bps
 Input packets: 23483 0 pps
 Output packets: 21687 0 pps
 ISDN alarms : None

Logical interface dc-4/0/0.32767 (Index 73) (SNMP ifIndex 74) (Generation 139)

Flags: Point-To-Point SNMP-Traps Encapsulation: 60
 Traffic statistics:
 Input bytes : 257592
 Output bytes : 664902
 Input packets: 23483
 Output packets: 21687
 Local statistics:
 Input bytes : 257592
 Output bytes : 664902
 Input packets: 23483
 Output packets: 21687

**show interfaces
extensive
(ISDN D-Channel)****user@host> show interfaces dc-4/0/0 extensive**

Physical interface: dc-4/0/0, Enabled, Physical link is Up
 Interface index: 150, SNMP ifIndex: 73, Generation: 151
 Type: Serial, Link-level type: 55, MTU: 4092, Clocking: Internal,
 Speed: 16kbps,
 Parent: br-4/0/0 Interface index 129
 Device flags : Present Running
 Interface flags: SNMP-Traps Internal: 0x4000
 Link type : Full-Duplex
 Link flags : None
 Physical info : Unspecified
 Hold-times : Up 0 ms, Down 0 ms
 Current address: Unspecified, Hardware address: Unspecified
 Alternate link address: Unspecified
 Last flapped : 2006-06-13 19:50:38 PDT (15:29:49 ago)
 Statistics last cleared: Never
 Traffic statistics:
 Input bytes : 257596 0 bps
 Output bytes : 231167 0 bps
 Input packets: 23484 0 pps
 Output packets: 21688 0 pps
 Input errors:
 Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
 Policed discards: 0, Resource errors: 0

Output errors:

Carrier transitions: 5, Errors: 0, Drops: 0, MTU errors: 0,
Resource errors: 0

ISDN alarms : None

| ISDN media: | Seconds | Count | State |
|-------------|---------|-------|-------|
| LOF | 1874 | 2 | OK |
| LOS | 1874 | 2 | OK |

Logical interface dc-4/0/0.32767 (Index 73) (SNMP ifIndex 74) (Generation 139)

Flags: Point-To-Point SNMP-Traps Encapsulation: 60

Traffic statistics:

| | |
|-----------------|--------|
| Input bytes : | 257596 |
| Output bytes : | 664927 |
| Input packets: | 23484 |
| Output packets: | 21688 |

Local statistics:

| | |
|-----------------|--------|
| Input bytes : | 257596 |
| Output bytes : | 664927 |
| Input packets: | 23484 |
| Output packets: | 21688 |

show interfaces (ISDN Dialer)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>dlnumber</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display information about the ISDN dialer interface. |
| Options | <p><i>dlnumber</i>—Display standard information about the specified ISDN dialer interface.</p> <p>brief detail extensive terse—(Optional) Display brief interface information.</p> <p>descriptions—(Optional) Display the interface description string.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (ISDN Dialer) on page 486</p> <p>show interfaces brief (ISDN Dialer) on page 487</p> <p>show interfaces detail (ISDN Dialer) on page 487</p> <p>show interfaces extensive (ISDN Dialer) on page 488</p> |
| Output Fields | Table 96 on page 481 lists the output fields for the show interfaces (ISDN dialer) command. Output fields are listed in the approximate order in which they appear. |

Table 96: ISDN Dialer show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical Interface | Name of the physical interface type. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number that reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 96: ISDN Dialer show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| Type | Interface type. | All levels |
| Link-level type | Type of encapsulation configured on the physical interface. | All levels |
| MTU | Maximum transmission unit (MTU)—Size of the largest transmitted packet. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Device flags | Information about the physical device. | All levels |
| Interface flags | Information about the interface. | All levels |
| Link type | Data transmission type. | detail extensive none |
| Link flags | Information about the link. | detail extensive none |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | MAC address of the hardware. | detail extensive |
| Alternate link address | Backup link address. | detail extensive |
| Last flapped | Date, time, and length of time since the interface status changed from down to up. | detail extensive none |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | none specified |
| Output rate | Output rate in bps and pps. | none specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 96: ISDN Dialer show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed discards—Frames that the incoming packet match code discarded because they were not recognized or were not of interest. Usually, this field reports protocols that the JUNOS software does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Index number of the logical interface (which reflects its initialization sequence). | detail extensive none |
| SNMP ifIndex | SNMP interface index number for the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |

Table 96: ISDN Dialer show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Dialer | <p>Information about the status and configuration of the dialer interface:</p> <ul style="list-style-type: none"> ■ State—State of the interface: Active or Inactive. ■ Dial pool—Dial pool name. ■ Dial strings—Dialing number for the ISDN connection. ■ Subordinate interfaces—Associated B-channel interface name and SNMP index number. ■ Activation delay—Length of time (in seconds) to wait before enabling the interface after the primary interface has failed. ■ Deactivation delay—Length of time (in seconds) to wait before disabling the interface after the primary interface is operational. ■ Initial route check delay—Wait period (in seconds) for the software to check if the primary interface is up after the router comes up. The range is from 1 through 300 seconds. The default is 120 seconds. ■ Redial delay—(Available on interfaces configured for ISDN dial-out.) Delay, in seconds, between two successive calls made. The range of values is 2 to 255. The default value is 3. ■ Callback wait period—Time, in seconds, that the dialer waits before it calls back the caller ID. The default value is 5. ■ Load threshold—Bandwidth threshold percentage used for adding interfaces. Another link is added to the multilink bundle when the load reaches the threshold value you set. The range of values is 0 to 100. The default value is 100. ■ Load interval—Interval used to calculate the average load on the network. By default, the average interface load is calculated every 60 seconds. | All levels |
| Bandwidth | Speed at which the interface is running. | detail extensive none |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the logical interface. ■ Output packets—Number of packets transmitted on the logical interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. This counter normally stabilizes in less than 1 second. | detail extensive |

Table 96: ISDN Dialer show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------------|
| Keepalive settings | <p>Configured settings for keepalives.</p> <ul style="list-style-type: none"> ■ interval seconds—Time in seconds between successive keepalive requests. The range is 10seconds through 32,767 seconds, with a default of 10 seconds. ■ up-count number—Number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. ■ down-count number—Number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. | detail extensive none |
| Keepalive statistics | <p>Information about keepalive packets. (When no level of output is specified, the word “statistics” is not part of the field name and the phrase “last seen” is not displayed.)</p> <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. | detail extensive none |
| LCP state | <p>Link Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | <p>Network Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |

Table 96: ISDN Dialer show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| CHAP state | Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction. <ul style="list-style-type: none"> ■ Chap-Resp-received—Response received for the challenge sent, but CHAP not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response sent for the challenge received. ■ Chap-Chal-sent—Challenge sent. ■ Chap-Chal-received—Challenge received but response not yet sent. ■ Down—CHAP authentication is incomplete (not yet completed or has failed). ■ Not-configured—CHAP is not configured on the interface. ■ Opened—CHAP authentication was successful. | detail extensive none |
| protocol family | Protocol family configured on the logical interface. If the family is <code>inet</code> , the IP address of the logical interface and the IP address on the remote side of the connection are included. | brief |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table <code>inet.0</code> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host>show interfaces d10
(ISDN Dialer)      Physical interface: d10, Enabled, Physical link is Up
                      Interface index: 153, SNMP ifIndex: 77
                      Type: 27, Link-level type: PPP, MTU: 1504
                      Device flags   : Present Running
                      Interface flags: SNMP-Traps
                      Link type      : Full-Duplex
                      Link flags     : Keepalives
                      Last flapped   : Never
                      Input rate     : 0 bps (0 pps)

```

Output rate : 0 bps (0 pps)

```
Logical interface d10.0 (Index 76) (SNMP ifIndex 78)
  Flags: Point-To-Point SNMP-Traps 0x4000 LinkAddress 23-0 Encapsulation: PPP
  Dialer:
    State: Active, Dial pool: 10
    Dial strings: 5551212
    Subordinate interfaces: bc-4/0/0:1 (Index 151)
    Activation delay: 0, Deactivation delay: 0
    Initial route check delay: 120
    Redial delay: 3
    Callback wait period: 5
    Load threshold: 0, Load interval: 60
  Bandwidth: 64kbps
  Input packets : 13
  Output packets: 10846
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 5412 (00:00:06 ago), Output: 5416 (00:00:05 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Closed
  Protocol inet, MTU: 1500
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.40.1, Local: 10.0.40.2
```

**show interfaces brief
(ISDN Dialer)**

```
user@host> show interfaces d10 brief
Physical interface: d10, Enabled, Physical link is Up
  Type: 27, Link-level type: PPP, MTU: 1504, Clocking: Unspecified,
  Speed: Unspecified
  Device flags : Present Running
  Interface flags: SNMP-Traps

Logical interface d10.0
  Flags: Point-To-Point SNMP-Traps 0x4000 LinkAddress 23-0 Encapsulation: PPP
  Dialer:
    State: Active, Dial pool: 10
    Dial strings: 5551212
    Subordinate interfaces: bc-4/0/0:1 (Index 151)
    Activation delay: 0, Deactivation delay: 0
    Initial route check delay: 120
    Redial delay: 3
    Callback wait period: 5
    Load threshold: 0, Load interval: 60
  inet 10.0.40.2 --> 10.0.40.1
```

**show interfaces detail
(ISDN Dialer)**

```
user@host> show interfaces d10 detail
Physical interface: d10, Enabled, Physical link is Up
  Interface index: 153, SNMP ifIndex: 77, Generation: 154
  Type: 27, Link-level type: PPP, MTU: 1504, Clocking: Unspecified,
  Speed: Unspecified
  Device flags : Present Running
  Interface flags: SNMP-Traps
  Link type : Full-Duplex
  Link flags : Keepalives
  Physical info : Unspecified
  Hold-times : Up 0 ms, Down 0 ms
  Current address: Unspecified, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped : Never
```

Statistics last cleared: Never

Traffic statistics:

| | | |
|-----------------|--------|--------|
| Input bytes : | 131116 | 40 bps |
| Output bytes : | 0 | 0 bps |
| Input packets: | 10847 | 0 pps |
| Output packets: | 0 | 0 pps |

Logical interface d10.0 (Index 76) (SNMP ifIndex 78) (Generation 142)

Flags: Point-To-Point SNMP-Traps 0x4000 LinkAddress 23-0 Encapsulation: PPP

Dialer:

State: Active, Dial pool: 10

Dial strings: 5551212

Subordinate interfaces: bc-4/0/0:1 (Index 151)

Activation delay: 0, Deactivation delay: 0

Initial route check delay: 120

Redial delay: 3

Callback wait period: 5

Load threshold: 0, Load interval: 60

Bandwidth: 64kbps

Traffic statistics:

| | |
|-----------------|--------|
| Input bytes : | 1092 |
| Output bytes : | 131459 |
| Input packets: | 13 |
| Output packets: | 10848 |

Local statistics:

| | |
|-----------------|--------|
| Input bytes : | 1092 |
| Output bytes : | 131459 |
| Input packets: | 13 |
| Output packets: | 10848 |

Transit statistics:

| | | |
|-----------------|---|-------|
| Input bytes : | 0 | 0 bps |
| Output bytes : | 0 | 0 bps |
| Input packets: | 0 | 0 pps |
| Output packets: | 0 | 0 pps |

Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3

Keepalive statistics:

Input : 5413 (last seen 00:00:03 ago)

Output: 5417 (last sent 00:00:02 ago)

LCP state: Opened

NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,

mpls: Not-configured

CHAP state: Closed

Protocol inet, MTU: 1500, Generation: 142, Route table: 0

Flags: None

Addresses, Flags: Is-Preferred Is-Primary

Destination: 10.0.40.1, Local: 10.0.40.2, Broadcast: Unspecified,

Generation: 142

show interfaces extensive (ISDN Dialer)

user@host> **show interfaces d10 extensive**

Physical interface: d10, Enabled, Physical link is Up

Interface index: 153, SNMP ifIndex: 77, Generation: 154

Type: 27, Link-level type: PPP, MTU: 1504, Clocking: Unspecified,

Speed: Unspecified

Device flags : Present Running

Interface flags: SNMP-Traps

Link type : Full-Duplex

Link flags : Keepalives

Physical info : Unspecified

Hold-times : Up 0 ms, Down 0 ms

Current address: Unspecified, Hardware address: Unspecified

Alternate link address: Unspecified

```

Last flapped      : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          131116          0 bps
  Output bytes :              0          0 bps
  Input packets:          10847          0 pps
  Output packets:           0          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0,
  Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0

```

```

Logical interface d10.0 (Index 76) (SNMP ifIndex 78) (Generation 142)
  Flags: Point-To-Point SNMP-Traps 0x4000 LinkAddress 23-0 Encapsulation: PPP
  Dialer:
    State: Active, Dial pool: 10
    Dial strings: 5551212
    Subordinate interfaces: bc-4/0/0:1 (Index 151)
    Activation delay: 0, Deactivation delay: 0
    Initial route check delay: 120
    Redial delay: 3
    Callback wait period: 5
    Load threshold: 0, Load interval: 60
  Bandwidth: 64kbps
  Traffic statistics:
    Input bytes :          1092
    Output bytes :        131459
    Input packets:           13
    Output packets:        10848
  Local statistics:
    Input bytes :          1092
    Output bytes :        131459
    Input packets:           13
    Output packets:        10848
  Transit statistics:
    Input bytes :              0          0 bps
    Output bytes :              0          0 bps
    Input packets:              0          0 pps
    Output packets:             0          0 pps
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 5413 (last seen 00:00:07 ago)
    Output: 5417 (last sent 00:00:06 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Closed
  Protocol inet, MTU: 1500, Generation: 142, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.0.40.1, Local: 10.0.40.2, Broadcast: Unspecified,
    Generation: 142

```

show isdn calls

| | |
|---------------------------------|--|
| Syntax | show isdn calls |
| Release Information | Command introduced in JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN connection calls. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show isdn calls on page 490 |
| Output Fields | Table 97 on page 490 lists the output fields for the show isdn calls command. Output fields are listed in the approximate order in which they appear. |

Table 97: show isdn calls Output Fields

| Field Name | Field Description |
|------------------------|---|
| Interface | ISDN interface configured for calling out. |
| Status | Current calling conditions of the ISDN interface. |
| Call Duration | Connection time (in seconds) for the call. |
| Call Direction | Indicates whether the call is a Dialout call, Dialincall, or Callback call. |
| Most recent error code | Calling errors on the ISDN interface. |

```

show isdn calls user@host> show isdn calls
Interface: bc-4/0/0:1
  Status: No call in progress
  Most recent error code: protocol error, unspecified
Interface: bc-4/0/0:2
  Status: Connected to 5552121
  Call Duration: 58549 seconds
  Call Direction: Dialout
  Most recent error code: No error

```

show isdn history

| | |
|--------------------------|---|
| Syntax | show isdn history |
| Release Information | Command introduced in JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN call history. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show isdn history on page 491 |
| Output Fields | Table 98 on page 491 lists the output fields for the show isdn history command. Output fields are listed in the approximate order in which they appear. |

Table 98: show isdn history Output Fields

| Field Name | Field Description |
|----------------|--|
| Calling Number | Telephone number configured as the primary dialing number. |
| Called Number | Telephone number used to dial the service provider. |
| Interface | ISDN interface used for calling the service provider. |
| Duration | Length of time (in seconds) that the ISDN call is connected. |
| Direction | Indicates whether the call is a Dialout call, Dialin call, or Callback call. |

| | | | | | |
|--------------------------|-------------------------------------|------------|----------|-----------|--|
| show isdn history | user@host> show isdn history | | | | |
| Calling | Called | Interface | Duration | Direction | |
| Number | Number | | | | |
| 551212 | 5552121 | bc-4/0/0:1 | 58663 | Dialin | |

show isdn q921 statistics

| | |
|---------------------------------|--|
| Syntax | show isdn q921 statistics <i>br-pim/0/port</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN Layer 2 statistics based on the Q.921 standard for the specified Basic Rate Interface (BRI) interface. |
| Options | <i>br-pim/0/port</i> —Basic Rate Interface (BRI) interface name. |
| Required Privilege Level | view |
| Related Topics | clear isdn q921 statistics |
| List of Sample Output | show isdn q921 statistics on page 492 |
| Output Fields | Table 99 on page 492 lists the output fields for the <code>show isdn q921 statistics</code> command. Output fields are listed in the approximate order in which they appear. |

Table 99: show isdn q921 statistics Output Fields

| Field Name | Field Description |
|-------------|--|
| Frame Type | <p>Frame type:</p> <ul style="list-style-type: none"> ■ INFO—Number of information frames sent and received. ■ RR—Number of receive ready frames sent and received. ■ RNR—Number of receive not ready frames sent and received. ■ REJ—Number of reject frames sent and received. ■ SABME—Number of set asynchronous balanced mode extended frames sent and received. ■ DISC—Number of disconnect frames sent and received. ■ UA—Number of unnumbered acknowledgement frames sent and received. ■ DM—Number of disconnect mode frames sent and received. ■ FRMR—Number of frame reject frames sent and received. ■ XID—Number of exchange identification frames sent and received. ■ UI—Number of unnumbered information frames sent and received. |
| Transmitted | Number of frames transmitted. |
| Received | Number of frames received. |

```

show isdn q921 statistics  user@host> show isdn q921 statistics br-6/0/0
                             Frame Type      Transmitted      Received
                             INFO              2196             3290
                             RR                9853             8759

```


| | | |
|-------|---|---|
| RNR | 0 | 0 |
| REJ | 0 | 0 |
| SABME | 1 | 0 |
| DISC | 0 | 0 |
| UA | 0 | 1 |
| DM | 0 | 0 |
| FRMR | 0 | 0 |
| XID | 0 | 0 |
| UI | 1 | 1 |

show isdn q931 statistics

| | |
|---------------------------------|---|
| Syntax | show isdn q931 statistics <i>br-pim/0/port</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN Layer 3 statistics based on the Q.931 standard for the specified Basic Rate Interface (BRI) interface. |
| Options | <i>br-pim/0/port</i> —Basic Rate Interface (BRI) interface name. |
| Required Privilege Level | view |
| Related Topics | clear isdn q931 statistics |
| List of Sample Output | show isdn q931 statistics on page 496 |
| Output Fields | Table 100 on page 495 lists the output fields for the <code>show isdn q931 statistics</code> command. Output fields are listed in the approximate order in which they appear. |

Table 100: show isdn q931 Statistics Output Fields

| Field Name | Field Description |
|--------------|--|
| Message Type | <p>Type of message:</p> <ul style="list-style-type: none"> ■ ALERTING—Number of messages indicating that called user alerting is initiated. ■ CALL PROCEED—Number of messages indicating that requested call establishment has been initiated and no more call establishment information is accepted. ■ CONNECT—Number of messages indicating that a call has gone through and is accepted. ■ CONNECT ACK—Number of messages sent by the network to the called user to indicate that the user is awarded the call. ■ PROGRESS—Number of messages indicating the progress of a call in relation to the provision of inband information or patterns. ■ SETUP—Number of requests to initiate call establishment. ■ SETUP ACK—Number of messages indicating that call establishment is initiated but additional information might be required. ■ DISCONNECT—Number of messages sent by the user to request clearing an end-to-end connection. ■ RELEASE—Number of messages sent by the network to indicate that the equipment sending the message has disconnected the channel and intends to release the channel and call reference. ■ RELEASE COMPLETE—Number of messages sent by the user or network to indicate that the equipment sending the message has released the channel and call reference, and that the channel is available for reuse. ■ RESTART—Number of messages that restart a call connection. ■ RESTART ACK—Number of messages that acknowledge the restart request by the remote network. ■ INFORMATION—Number of messages that provide information for call establishment or miscellaneous call-related information. ■ NOTIFY—Number of messages that contain information pertaining to a call. ■ STATUS—Number of messages sent in response to a status enquiry message or at any time during a call to report certain error conditions. ■ STATUS ENQUIRY—Number of messages sent to solicit a status message from the peer Layer 3 entity. |
| Transmitted | Number of messages transmitted. |
| Received | Number of messages received. |

```
user@host> show isdn q931 statistics br-4/0/0
```

| Message Type | Transmitted | Received |
|------------------|-------------|----------|
| ALERTING | 1 | 0 |
| CALL PROCEED | 1 | 229 |
| CONNECT | 1 | 0 |
| CONNECT ACK | 0 | 1 |
| PROGRESS | 0 | 0 |
| SETUP | 229 | 1096 |
| SETUP ACK | 0 | 0 |
| DISCONNECT | 0 | 229 |
| RELEASE | 1324 | 0 |
| RELEASE COMPLETE | 0 | 1324 |
| RESTART | 0 | 0 |
| RESTART ACK | 0 | 0 |
| INFORMATION | 0 | 0 |
| NOTIFY | 0 | 0 |
| STATUS | 0 | 0 |
| STATUS ENQUIRY | 0 | 0 |

show isdn status

| | |
|---------------------------------|--|
| Syntax | show isdn status <brief detail> <br-pim/0/port> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display ISDN status information. |
| Options | <p>none—Display standard ISDN status information for all Basic Rate Interface (BRI) interfaces.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>br-pim/0/port—(Optional) Display status information for the specified BRI interface only.</p> |
| Required Privilege Level | view |
| List of Sample Output | show isdn status on page 497 |
| Output Fields | Table 101 on page 497 lists the output fields for the show isdn status command. Output fields are listed in the approximate order in which they appear. |

Table 101: show isdn status Output Fields

| Field Name | Field Description |
|----------------|---|
| Interface | ISDN BRI interface name. |
| Layer 1 status | Layer 1 status: active or inactive. |
| Layer 2 status | Layer 2 status: <ul style="list-style-type: none"> ■ CES—Common endpoint suffix value. ■ Q.921—Q.921 status: up or down. ■ TEI—Assigned terminal endpoint identifier (TEI) number. |
| Layer 3 status | Number of active calls, plus: <ul style="list-style-type: none"> ■ Switch Type—Type of ISDN switch based on the manufacturer. ■ Interface Type—Information relating to a local or network interface. ■ Calling number—Telephone number configured as the primary dialing number. ■ T310—Q.931-specific timer value. ■ Tei Option—Initial connectivity configuration of the ISDN interface. |

show isdn status user@host> show isdn status

```
Interface: br-4/0/0
Layer 1 status: active
Layer 2 status:
  CES: 0, Q.921: up, TEI: 64
Layer 3 status: 1 Active calls
Switch Type      : ATT5E
Interface Type   : USER
Calling number   : 5551212
T310             : 10 seconds
Tei Option       : Power Up
```

Part 10

Channelized Interfaces

- Channelized E1 Interface Operational Mode Commands on page 501
- Channelized OC Interface Operational Commands on page 517
- Channelized STM1 Interface Operational Mode Commands on page 547
- Channelized T1 and T3 Interface Operational Mode Commands on page 567

Chapter 15

Channelized E1 Interface Operational Mode Commands

Table 102 on page 501 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot channelized E1 interfaces. Commands are listed in alphabetical order.

Table 102: Channelized E1 Interface Operational Mode Commands

| Task | Command |
|--|--|
| Display status information about channelized E1 interfaces. | show interfaces (Channelized E1) |
| Display channelized E1 IQ interface information. | show interfaces (Channelized E1 IQ) |
| Display the interface names of the physical channelized E1 IQ interface and the channels configured on each interface. | show interfaces controller (Channelized E1 IQ) |



NOTE: For more information about the channel type and level of channelization, and for information about the number of channels that are supported on the channelized E1 interface, see the *JUNOS Network Interfaces Configuration Guide*.

For channelization illustrations and configuration examples for channelized IQ interfaces, see the *JUNOS Feature Guide*.

show interfaces (Channelized E1)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>ds-fpc/pic/port:ds0channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information the specified channelized E1 interface. |
| Options | <p><i>ds-fpc/pic/port:ds0channel</i>—Display standard information about the specified channelized E1 interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Channelized E1) on page 510 |
| Output Fields | Table 103 on page 502 lists the output fields for the show interfaces (Channelized E1 and Channelized E1 IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------------|
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source: Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Framing | Physical layer framing format used on the link. It can be G704 , G704-NO-CRC4 , or Unframed . The default is G704 . | All levels |
| Parent | (Channelized E1 IQ interfaces only) Name and interface index of the interface to which a particular child interface belongs. None indicates that this interface is the top level. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ Interval seconds—Time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ Down-count number—Number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ Up-count number—Number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive none |
| Keepalive statistics | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format hh:mm:ss. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format hh:mm:ss. | detail extensive none |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------|--|-----------------------|
| LMI settings | <p>(Frame Relay) Settings for link management can be either ANSI LMI settings or ITU LMI settings. ANSI LMI settings is the default. The format is (ANSI or ITU) LMI settings: <i>value, value...</i> xx seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1–255) ■ n392dce—DCE error threshold (1–10) ■ n392dte—DTE error threshold (1–10) ■ n393dce—DCE monitored event count (1–10) ■ n393dte—DTE monitored event count (1–10) ■ t391dte—DTE polling timer (5–30 seconds) ■ t392dce—DCE polling verification timer (5–30 seconds) | detail extensive none |
| LMI | <p>(Frame Relay) Statistics about the link management.</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: <i>nn</i> (last seen <i>hh:mm:ss ago</i>) ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: <i>nn</i> (last sent <i>hh:mm:ss ago</i>). | detail extensive none |
| DTE statistics | <p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data circuit-terminating equipment (DCE):</p> <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |
| DCE statistics | <p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Common statistics | <p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no LMI packet was reported for <code>n392dte</code> or <code>n393dce</code> intervals. (See LMI settings). | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay, displayed only from the DTE) Number of DLCIs configured from the DCE. | detail extensive none |
| LCP state | <p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone(hour:minute:second ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| CoS Queues | Number of CoS queues configured. | detail extensive none |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|--|------------------|
| Traffic statistics | <p>Number of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Giants—Number of frames received that are larger than the giant threshold. ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), then either the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| DS1 alarms DS1 defects | <p>E1 media-specific defects that can render the interface unable to pass packets. When a defect persists for a certain amount of time, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. The following lists all possible alarms and defects. For complete explanations of most of these alarms and defects, see <i>Bellcore Telcordia GR-499-CORE</i>.</p> <ul style="list-style-type: none"> ■ LOS—Loss of signal. ■ LOF—Loss of frame. ■ AIS—Alarm indication signal. ■ YLW—Yellow alarm. Indicates errors at the remote site receiver. | detail extensive none |
| E1 media | <p>Active alarms and defects, plus counts of specific E1 errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>The E1 media-specific error types can be:</p> <ul style="list-style-type: none"> ■ SEF—Severely errored framing ■ BEE—Bit error ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ YELLOW—Errors at the remote site receiver ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—Pulse code violation ■ CS—Carrier state ■ FEBE—Far-end block error ■ LES—Line error seconds ■ ES—Errored seconds ■ BES—Bit error seconds ■ SES—Severely errored seconds ■ SEFS—Severely errored framing seconds ■ UAS—Unavailable seconds | extensive |
| HDLC configuration | <p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Timeslots—Configured time slots for the interface. ■ Line encodingHDB3—Line encoding used. | extensive |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| Interface transmit queues | Names of the transmit queues and their associated statistics for each DS0 channel on the Channelized E1 to DS0 PIC. <ul style="list-style-type: none"> ■ B/W—Queue bandwidth as a percentage of the total interface bandwidth. ■ WRR—Weighted round robin (in percent). ■ Packets—Number of packets transmitted. ■ Bytes—Number of bytes transmitted. ■ Drops—Number of packets dropped. ■ Errors—Number of packet errors. | extensive |
| DSx BERT configuration | BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface. <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—Queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth%</i>—Percentage of bandwidth allocated to the queue. ■ <i>Bandwidth bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. ■ <i>Buffer usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ <i>Priority</i>—Queue priority. Possible values are low and high. ■ <i>Limit</i>—Displayed if rate limiting is configured for the queue: none or exact. If exact is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |

Table 103: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the logical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Local statistics | (Frame Relay) Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | (Frame Relay) Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as iso, inet6, mpls. | detail extensive none |
| Multilink bundle | (Multilink) Interface name for the multilink bundle, if configured. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| DLCI | <p>(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags, Total down time, Last down, and Traffic statistics. Flags is one or more of the following:</p> <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when link is active, but no information is received from the DCE. ■ Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ Dce-configured—Displayed when the command is issued from the DTE. | detail extensive none |
| DLCI statistics | <p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

```

show interfaces      user@host> show interfaces ds-0/1/1:1 extensive
extensive           Physical interface: ds-0/1/1:1, Enabled, Physical link is Down
(Channelized E1)    Interface index: 163, SNMP ifIndex: 37, Generation: 46
                      Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: E1,
                      Loopback: None, FCS: 16, Framing: G704
                      Device flags   : Present Running Down
                      Interface flags: Hardware-Down Point-To-Point SNMP-Traps Internal: 0x4000
                      Link flags     : Keepalives
                      Hold-times      : Up 0 ms, Down 0 ms
                      CoS queues      : 4 supported, 4 maximum usable queues
                      Last flapped    : 2005-12-28 14:44:06 PST (00:00:30 ago)
                      Statistics last cleared: Never
                      Traffic statistics:
                        Input bytes   :                0                0 bps
                        Output bytes  :                0                0 bps
                        Input packets :                0                0 pps
                        Output packets:                0                0 pps
                      Input errors:
                        Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 0,
                        L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
                        HS link CRC errors: 0, Resource errors: 0
                      Output errors:
                        Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
                        Resource errors: 0
                      DS1 alarms   : LOF, LOS
                      DS1 defects  : LOF, LOS
                      E1 media:
                        Seconds      Count  State
                        SEF          982318    1 Defect Active
                        BEE          0         0 OK
                        AIS          0         0 OK
                        LOF          982318    1 Defect Active
                        LOS          982318    1 Defect Active
                        YELLOW        0         0 OK
                        BPV           1         1
                        EXZ           1         1
                        LCV           1         1
                        PCV           1         2
                        CS            0         0
                        FEBE          1         9
                        LES           1
                        ES            982318
                        SES            982318
                        SEFS            982318
                        BES            1
                        UAS            0
                      Interface transmit queues:
                        B/W  WRR      Packets      Bytes      Drops      Errors
                        Queue0  95  95          0          0          0          0
                        Queue1   5   5          0          0          0          0
                      HDLC configuration:
                        Giant threshold: 1514, Runt threshold: 3
                        Timeslots      : 31
                        Line encoding: HDB3, Data inversion: Disabled, Idle cycle flag: flags,
                        Start end flag: shared
                      DS1 BERT configuration:
                        BERT time period: 0 seconds, Elapsed: 0 seconds
                        Induced Error rate: 10e-0, Algorithm: 2^11 - 1, 0.152 and 0.153 (2047 type),
                        Pseudorandom (8)
                      Packet Forwarding Engine configuration:
                        Destination slot: 0, PLP byte: 2 (0x1b)
                        CoS transmit queue  Bandwidth      Buffer  Priority  Limit

```

| | | % | bps | % | usec | | |
|---|-----------------|----|---------|----|------|-----|------|
| 0 | best-effort | 95 | 1945600 | 95 | 0 | low | none |
| 3 | network-control | 5 | 102400 | 5 | 0 | low | none |

show interfaces (Channelized E1 IQ)

| | |
|---|--|
| Syntax | show interfaces (<i>ce1-fpc/pic/port</i> <i>type-fpc/pic/port<:channel></i>) <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified channelized E1 IQ interface. |
| Options | <p><i>type-fpc/pic/port<:channel></i>—Interface type with optional corresponding channel levels. For the physical channelized E1 IQ interface, <i>type</i> is <i>ce</i>. For the clear channel, <i>type</i> is <i>e1</i>. At the first level of channelization, <i>type</i> is <i>ds</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Channelized E1 IQ) (Physical) on page 512</p> <p>show interfaces extensive (Channelized E1 IQ Multilink PPP Encapsulation) on page 513</p> <p>show interfaces extensive (Channelized E1 IQ MLFR Encapsulation) on page 514</p> <p>show interfaces detail (Clear Channel E1) on page 515</p> |
| Output Fields | Table 103 on page 502 lists the output fields for the show interfaces (Channelized E1 and Channelized E1 IQ) command. Output fields are listed in the approximate order in which they appear. |
| show interfaces (Channelized E1 IQ) (Physical) | <pre> user@host> show interfaces ce1-1/2/3 Physical interface: ce1-1/2/3, Enabled, Physical link is Up Interface index: 18, SNMP ifIndex: 1128 Link-level type: Frame-relay, Controller, MTU: 1504, Clocking: Internal, Speed: E1, Loopback: None, FCS: 16, Framing: G704, Parent: None Device flags : Present Running Interface flags: Point-To-Point SNMP-Traps Link flags : Keepalives DTE ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago) DTE statistics: Enquiries sent : 43186 Full enquiries sent : 8515 </pre> |

```

    Enquiry responses received      : 43185
    Full enquiry responses received : 8515
DCE statistics:
    Enquiries received             : 0
    Full enquiries received        : 0
    Enquiry responses sent         : 0
    Full enquiry responses sent    : 0
Common statistics:
    Unknown messages received      : 0
    Asynchronous updates received  : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout    : 0
Nonmatching DCE-end DLCIs:
    2
Last flapped   : 2002-10-04 17:52:51 PDT (00:32:57 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)
DS1 alarms     : None
DS1 defects    : None

```

**show interfaces
extensive (Channelized
E1 IQ Multilink PPP
Encapsulation)**

```

user@host> show interfaces ds-0/3/4:1 extensive
Physical interface: ds-0/3/4:1, Enabled, Physical link is Up
  Interface index: 151, SNMP ifIndex: 63, Generation: 34
  Link-level type: Multilink-PPP, MTU: 1518, Clocking: Internal, Speed: 64kbps,
  Loopback: None, FCS: 16,
  Parent: ce1-0/3/4 Interface index 150
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : None
  Hold-times     : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 0 (last seen: never)
    Output: 0 (last sent: never)
  LCP state: Down
  CHAP state: Closed
  CoS queues   : 4 supported, 4 maximum usable queues
  Last flapped : Never
  Statistics last cleared: 2005-12-21 10:32:15 PST (1w0d 03:10 ago)
  Traffic statistics:
    Input bytes   : 0                0 bps
    Output bytes  : 6070570          224 bps
    Input packets : 0                0 pps
    Output packets: 209330           0 pps
  Input errors:
    Errors: 3, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0,
    L2 mismatch timeouts: 0, HS link CRC errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
    Resource errors: 0
  HDLC configuration:
    Giant threshold: 1528, Runt threshold: 2
    Timeslots      : 1
    Data inversion: Disabled, Idle cycle flag: flags, Start end flag: shared
  DSO BERT configuration:
    BERT time period: 10 seconds, Elapsed: 0 seconds
    Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
  Packet Forwarding Engine configuration:
    Destination slot: 0, PLP byte: 4 (0x00)

```

```

Logical interface ds-0/3/4:1.0 (Index 74) (SNMP ifIndex 64) (Generation 13)
  Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol mlppp, Multilink bundle: ls-0/1/0.0, MTU: 1514, Generation: 24,
  Route table: 0

show interfaces
extensive (Channelized
E1 IQ MLFR
Encapsulation)
user@host> show interfaces ds-0/3/4:5 extensive
Physical interface: ds-0/3/4:5, Enabled, Physical link is Up
  Interface index: 155, SNMP ifIndex: 72, Generation: 38
  Link-level type: Multilink-FR, MTU: 1518, Clocking: Internal, Speed: 64kbps,
  Loopback: None, FCS: 16,
  Parent: ce1-0/3/4 Interface index 150
  Device flags : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags : No-Keepalives DCE
  Hold-times : Up 0 ms, Down 0 ms
  ANSI LMI settings: n392dce 3, n393dce 4, t392dce 15 seconds
  LMI statistics:
    Input : 0 (last seen: never)
    Output: 0 (last sent: never)
  DTE statistics:
    Enquiries sent : 0
    Full enquiries sent : 0
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received : 0
    Full enquiries received : 0
    Enquiry responses sent : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 0
  CoS queues : 4 supported, 4 maximum usable queues
  Last flapped : 2005-12-21 09:59:01 PST (1w0d 03:44 ago)
  Statistics last cleared: 2005-12-21 10:32:15 PST (1w0d 03:10 ago)
  Traffic statistics:
    Input bytes : 0 0 bps
    Output bytes : 0 0 bps
    Input packets: 0 0 pps
    Output packets: 0 0 pps
  Input errors:
    Errors: 3, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0,
    L2 mismatch timeouts: 0, HS link CRC errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
    Resource errors: 0
  HDLC configuration:
    Giant threshold: 1528, Runt threshold: 2
    Timeslots : 5
    Data inversion: Disabled, Idle cycle flag: flags, Start end flag: shared
  DSO BERT configuration:
    BERT time period: 10 seconds, Elapsed: 0 seconds
    Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
  Packet Forwarding Engine configuration:
    Destination slot: 0, PLP byte: 4 (0x01)

Logical interface ds-0/3/4:5.0 (Index 78) (SNMP ifIndex 73) (Generation 17)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID

```

```

Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
Local statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
Transit statistics:
  Input bytes :          0          0 bps
  Output bytes :          0          0 bps
  Input packets:          0          0 pps
  Output packets:         0          0 pps
Protocol mlfrr, Multilink bundle: ls-0/1/0.1, MTU: 1514, Generation: 28, Route
table: 0
DLCI 10
  Flags: Active
  Total down time: 0 sec, Last down: Never
  Traffic statistics:
    Input bytes :          0
    Output bytes :          0
    Input packets:          0
    Output packets:         0
DLCI statistics:
  Active DLCI :1 Inactive DLCI :0

```

**show interfaces detail
(Clear Channel E1)**

```

user@host> show interfaces e1-1/2/6 detail
Physical interface: e1-1/2/6, Enabled, Physical link is Up
Interface index: 89, SNMP ifIndex: 1278, Generation: 341
Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: E1, Loopback:None,
...
Logical interface e1-1/2/6.0 (Index 52) (SNMP ifIndex 1279) (Generation 169)
  Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
  Bandwidth: 0
...

```

show interfaces controller (Channelized E1 IQ)

| | |
|---------------------------------|--|
| Syntax | show interfaces controller <i>ce1-fpc/pic/port</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display the interface names of the physical channelized E1 IQ interface and the channels configured on each interface. |
| Options | <i>ce1-fpc/pic/port</i> —Basic Rate Interface (BRI) interface name. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces controller (Channelized E1 IQ with Logical E1) on page 516 show interfaces controller (Channelized E1 IQ with Logical DS0) on page 516 |
| Output Fields | Table 104 on page 516 lists the output fields for the show interfaces controller (Channelized E1 IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 104: Channelized E1 IQ show interfaces controller Output Fields

| Field Name | Field Description |
|------------|---|
| Controller | Physical channelized interface name and the names of any channels configured on it. |
| Admin | Administrative status of the interface. |
| Link | Link status of the interface. |

| | | |
|--|--|--|
| show interfaces controller (Channelized E1 IQ with Logical E1) | <pre> user@host> show interfaces controller ce1-1/2/6 Controller ce1-1/2/6 e1-1/2/6 </pre> | <pre> Admin Link up up up up </pre> |
| show interfaces controller (Channelized E1 IQ with Logical DS0) | <pre> user@host> show interfaces controller ce1-1/2/3 Controller ce1-1/2/3 ds-1/2/3:1 ds-1/2/3:2 </pre> | <pre> Admin Link up up up up up up </pre> |

Chapter 16

Channelized OC Interface Operational Commands

Table 105 on page 517 summarizes the command-line interface (CLI) commands to monitor and troubleshoot channelized OC interfaces. Commands are listed in alphabetical order.

Table 105: Channelized OC Interface Operational Mode Commands

| Task or Information to Monitor | CLI Command |
|--|--|
| Display channelized OC3 IQ and IQE interface information. | show interfaces (Channelized OC3 IQ and IQE) |
| Display status information about channelized OC12 interfaces. | show interfaces (Channelized OC12) |
| Display channelized OC12 IQ and IQE interface information. | show interfaces (Channelized OC12 IQ and IQE) |
| Display the interface names of the physical channelized OC3 IQ and IQE interface and the channels configured on each interface. | show interfaces controller (Channelized OC3 IQ and IQE) |
| Display the interface names of the physical channelized OC12 IQ and IQE interface and the channels configured on each interface. | show interfaces controller (Channelized OC12 IQ and IQE) |



NOTE: For more information about the channel type and level of channelization, and for information about the number of channels that are supported on channelized OC interfaces, see the *JUNOS Network Interfaces Configuration Guide*.

For channelization illustrations and configuration examples for channelized IQ and IQE interfaces, see the *JUNOS Feature Guide*.

show interfaces (Channelized OC3 IQ and IQE)

Syntax `show interfaces (type-fpc/pic/port <:channel><:channel><:channel>)
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index snmp-index>
<statistics>`

Release Information Command introduced before JUNOS Release 7.4.

Description (M-series and T-series routing platforms only) Display status information about the specified channelized OC3 IQ or IQE interface.

Options `type-fpc/pic/port:channel:channel:channel`—Interface type with optional corresponding channel levels. The interface type can be one of the following:

- `type-fpc/pic/port`—For the physical interface, *type* is `coc3`. For the clear channel, *type* is `so` (for OC3).
- `type-fpc/pic/port:channel`—At the first level of channelization, *type* can be `coc1` (channelized OC1), `ct3` (from `coc1`), or `t3` (from `coc1`).
- `type-fpc/pic/port:channel:channel`—At the second level of channelization, *type* can be `ct1` (from `coc1` or `ct3`) or `t1` (from `coc1` or `ct3`).
- `type-fpc/pic/port:channel:channel:channel`—At the third level of channelization, *type* can be `ds` (from `ct1`).

`brief | detail | extensive | terse`—(Optional) Display the specified level of output.

`descriptions`—(Optional) Display interface description strings.

`media`—(Optional) Display media-specific information about network interfaces.

`snmp-index snmp-index`—(Optional) Display information for the specified SNMP index of the interface.

`statistics`—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output `show interfaces extensive` (Channelized OC3 IQ) (Physical) on page 532
`show interfaces extensive` (Channelized OC1 on Channelized OC3 IQ) on page 533
`show interfaces extensive` (Channelized T1 on Channelized OC3 IQ) on page 534
`show interfaces extensive` (DS0 on Channelized OC3 IQ) on page 535

Output Fields Table 106 on page 519 lists the output fields for the `show interfaces` (all Channelized OC interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 106: Channelized OC show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Description | Interface description. | All levels |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | SONET/SDH reference clock source. It can be Internal or External . Clocking is configured and displayed only for channel 0. | All levels |
| <i>Framing mode</i> | Framing mode: SONET or SDH . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| SONET loopback | Whether loopback is enabled on a SONET/SDH interface, and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16-bit . | All levels |
| Payload scrambler | Whether payload scrambling is enabled. | All levels |
| Parent | Name and interface index of the interface to which a particular child interface belongs. None indicates that this interface is the top level. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |

Table 106: Channelized OC show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| ANSI or ITU LMI settings | <p>(Frame Relay) Settings for Local Management Interface (LMI). The format is (ANSI or ITU) LMI settings: <i>value</i>, <i>value</i>... <i>nn</i> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ <i>n391dte</i>—DTE full status polling interval (1–255) ■ <i>n392dce</i>—DCE error threshold (1–10) ■ <i>n392dte</i>—DTE error threshold (1–10) ■ <i>n393dce</i>—DCE monitored event count (1–10) ■ <i>n393dte</i>—DTE monitored event count (1–10) ■ <i>t391dte</i>—DTE polling timer (5–30 seconds) ■ <i>t392dce</i>—DCE polling verification timer (5–30 seconds) | All levels |
| LMI statistics | <p>(Frame Relay) Statistics about the link management.</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: <i>nn</i> (last sent <i>hh:mm:ss</i> ago). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: <i>nn</i> (last sent <i>hh:mm:ss</i> ago). | detail extensive |
| DTE statistics | <p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data circuit-terminating equipment (DCE):</p> <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |
| DCE statistics | <p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Common statistics | <p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no LMI packet was reported for n392dte or n393dce intervals. (See LMI settings.) | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay) Number of DLCIs configured from the DCE, displayed only from the DTE. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hh:mm:ss timezone year-month-day (hh:mm:ss ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive none |
| CoS Queues | Number of CoS queues configured. | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| DS1 alarms DS1 defects | <p>E1 or T1 media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. The following lists all possible alarms and defects. For complete explanations of most of these alarms and defects, see <i>Belcore Telcordia GR-499-CORE</i>.</p> <ul style="list-style-type: none"> ■ LOS—Loss of signal. ■ LOF—Loss of frame. ■ AIS—Alarm indication signal. ■ YLW—Yellow alarm. Indicates errors at the remote site receiver. | detail extensive none |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|---|------------------|
| T1 media | <p>Counts of T1 or E1 media-specific errors.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>The T1 or E1 media-specific error types are:</p> <ul style="list-style-type: none"> ■ SEF—Severely errored framing ■ BEE—Bit error ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ YELLOW—Errors at the remote site receiver ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—Pulse code violation ■ CS—Carrier state ■ FEBE—Far-end block error (E1 only) ■ LES—Line error seconds ■ ES—Errored seconds ■ BES—Bit error seconds ■ SES—Severely errored seconds ■ SEFS—Severely errored framing seconds ■ UAS—Unavailable seconds | extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------|--|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Bucket Drops—Drops caused by traffic load exceeding the interface transmit/receive leaky bucket configuration. The default is off. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ SRAM errors—Number of hardware errors that occurred in the static RAM (SRAM) on the PIC. If the value of this field increments, the PIC is malfunctioning. ■ HS link FIFO overflows—Number of FIFO overflows on the high-speed links between the ASICs responsible for handling the router interfaces. ■ Resource errors—Sum of transmit drops. | extensive |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|----------------|--|------------------|
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ HS link FIFO underflows—Number of FIFO underflows on the high-speed links between the ASICs responsible for handling the router interfaces. ■ MTU errors—Number of packets whose size exceeds the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| Active alarms | Defects that can prevent the interface from passing packets: | detail extensive |
| Active defects | <ul style="list-style-type: none"> ■ None—There are no active defects or alarms. ■ LOF—Loss of frame. | |
| SONET alarms | Media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain amount of time, it is promoted to an alarm. | All levels |
| SONET defects | Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SONET PHY , SONET section , SONET line , and SONET path . | |

Table 106: Channelized OC show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------|--|-----------------|
| SONET vt | <p>SONET virtual-tributary (VT) alarms and defects:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B2—Bit interleaved parity for SONET line overhead ■ REI-V—Remote error indication (near-end VT) ■ LOP-V—Loss of pointer (near-end VT) ■ AIS-V—Alarm indication signal (near-end VT) ■ RDI-V—Remote defect indication (near-end VT) ■ UNEQ-V—Unequipped (near-end VT) ■ PLM-V—Payload label mismatch (near-end VT) ■ ES-V—Errored seconds (near-end VT) ■ SES-V—Severely errored seconds (near-end VT) ■ UAS-V—Unavailable seconds (near-end VT) ■ ES-VFE—Errored seconds (far-end VT) ■ SES-VFE—Severely errored seconds (far-end VT) ■ UAS-VFE—Unavailable seconds (far-end VT) | extensive |
| SONET PHY | <p>Counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |
| SONET section | <p>Counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B1—Bit interleaved parity for SONET section overhead ■ SEF—Severely errored framing ■ LOS—Loss of signal ■ LOL—Loss of light ■ LOF—Loss of frame ■ ES-S—Errored seconds (section) ■ SES-S—Severely errored seconds (section) ■ SEFS-S—Severely errored framing seconds (section) | extensive |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|------------|---|-----------------|
| SONET line | <p>Active alarms and defects, plus counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State —State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B2—Bit interleaved parity for SONET line overhead ■ REI-L—Remote error indication (near-end line) ■ RDI-L—Remote defect indication (near-end line) ■ AIS-L—Alarm indication signal (near-end line) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ ES-L—Errored seconds (near-end line) ■ SES-L—Severely errored seconds (near-end line) ■ UAS-L—Unavailable seconds (near-end line) ■ ES-LFE—Errored seconds (far-end line) ■ SES-LFE—Severely errored seconds (far-end line) ■ UAS-LFE—Unavailable seconds (far-end line) | extensive |
| SONET path | <p>Active alarms and defects, plus counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ BIP-B3—Bit interleaved parity for SONET section overhead ■ REI-P—Remote error indication ■ LOP-P—Loss of pointer (path) ■ AIS-P—Path alarm indication signal ■ RDI-P—Path remote defect indication ■ UNEQ-P—Path unequipped ■ PLM-P—Path payload label mismatch ■ ES-P—Errored seconds (near-end STS path) ■ SES-P—Severely errored seconds (near-end STS path) ■ UAS-P—Unavailable seconds (near-end STS path) ■ ES-PFE—Errored seconds (far-end STS path) ■ SES-PFE—Severely errored seconds (far-end STS path) ■ UAS-PFE—Unavailable seconds (far-end STS path) | extensive |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|----------------------------|---|-----------------|
| Received SONET overhead | Values of the received and transmitted SONET/SDH overhead: | extensive |
| Transmitted SONET overhead | <p>F1—Section user channel byte. This byte is set aside for the purposes of users.</p> <p>S1—Synchronization Status (S1). The S1 byte is located in the first STS-1 of an STS-N. Bits 5 through 8 convey the synchronization status of the network element.</p> <p>Z3 and Z4—Path overhead.</p> <p>V5—Virtual Tributary (VT) path overhead byte.</p> | |
| SDH alarms | SDH media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SDH PHY, SDH regenerator section, SDH multiplex section, and SDH path. | All levels |
| SDH defects | | |
| SDH PHY | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |
| SDH regenerator section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ RS-BIP8—24-bit BIP for multiplex section overhead (B2 bytes) ■ OOF—Out of frame ■ LOS—Loss of signal ■ LOF—Loss of frame ■ RS-ES—Errored seconds (near-end regenerator section) ■ RS-SES—Severely errored seconds (near-end regenerator section) ■ RS-SEFS—Severely errored framing seconds (regenerator section) | extensive |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-----------------------|---|-----------------|
| SDH multiplex section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ MS-BIP24—8-bit BIP for high-order path overhead (B3 byte) ■ MS-FEBE—Far-end block error (multiplex section) ■ MS-FERF—Far-end remote fail (multiplex section) ■ MS-AIS—alarm indication signal (multiplex section) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ MS-ES—Errored seconds (near-end multiplex section) ■ MS-SES—Severely errored seconds (near-end multiplex section) ■ MS-UAS—Unavailable seconds (near-end multiplex section) ■ MS-ES-FE—Errored seconds (far-end multiplex section) ■ MS-SES-FE—Severely errored seconds (far-end multiplex section) ■ MS-UAS-FE—Unavailable seconds (far-end multiplex section) | extensive |
| SDH path | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ HP-BIP8—8-bit BIP for regenerator section overhead (B1 byte) ■ HP-FEBE—Far-end block error (high-order path) ■ HP-LOP—Loss of pointer (high-order path) ■ HP-AIS—High-order-path alarm indication signal ■ HP-FERF—Far-end remote fail (high-order path) ■ HP-UNEQ—Unequipped (high-order path) ■ HP-PLM—Payload label mismatch (high-order path) ■ HP-ES—Errored seconds (near-end high-order path) ■ HP-SES—Severely errored seconds (near-end high-order path) ■ HP-UAS—Unavailable seconds (near-end high-order path) ■ HP-ES-FE—Errored seconds (far-end high-order path) ■ HP-SES-FE—Severely errored seconds (far-end high-order path) ■ HP-UAS-FE—Unavailable seconds (far-end high-order path) | extensive |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------|
| Received SDH overhead | Values of the received and transmitted SONET overhead: | extensive |
| Transmitted SDH overhead | <ul style="list-style-type: none"> ■ C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. ■ F1—Section user channel byte. This byte is set aside for the purposes of users. ■ K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. ■ J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. ■ S1—Synchronization status. The S1 byte is located in the first STS-1 of an STS-N. ■ Z3 and Z4—Allocated for future use. | |
| Received path trace | Channelized OC12 interfaces allow path trace bytes to be sent inband across the SONET/SDH link. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits. This information is specific to each of the 12 channelized OC12 interfaces. | extensive |
| Transmitted path trace | | |
| DS3 media | <p>Counts of T3 media-specific errors. For detailed definitions of the T3 (DS-3) error events (BPV, EXZ, LCV, PCV, and CCV) and performance parameters (LES, PES, PSES, CES, CSES, SEFS, and UAS), see RFC 2496.</p> <p>The DS3 or E3 media-specific error types can be:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop out of lock ■ Reframing—Frame alignment recovery time ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ IDLE—Idle code detected ■ YELLOW—Errors at the remote site receiver ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—(DS3 only) Pulse code violation ■ CCV—(DS3 only) C-bit coding violation ■ FEBE—(DS3 only) Far-end block error ■ LES—Line error seconds ■ PES—(DS3 only) P-bit errored seconds ■ PSES—(DS3 only) P-bit errored seconds (section) ■ CES—(DS3 only) C-bit errored seconds ■ CSES—(DS3 only) C-bit severely errored seconds ■ SEFS—Severely errored framing seconds ■ UAS—Unavailable seconds | extensive |

Table 106: Channelized OC show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| HDLC configuration | <p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> ■ Policing bucket—Configured state of the receiving policer. ■ Shaping bucket—Configured state of the transmitting shaper. ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Timeslots—Configured time slots for the interface. ■ Line encoding—Line encoding used. It is always HDB3. ■ Byte encoding—(T1 only) Byte encoding used: Nx64K or Nx56K. ■ Line encoding—Line encoding used. For T1, the value can be B8ZS or AMI. For E1, the value is HDB3. ■ Data inversion—HDLC data inversion setting: Enabled or Disabled. ■ Idle cycle flag—Idle cycle flags. ■ Start end flag—Start and end flag. | extensive |
| Interface transmit queues | <p>Name of the transmit queues and their associated statistics for each DS3 channel on the Channelized OC12 PIC.</p> <ul style="list-style-type: none"> ■ B/W—Queue bandwidth as a percentage of the total interface bandwidth. ■ WRR—Weighted round-robin (in percent). ■ Packets—Number of packets transmitted. ■ Bytes—Number of bytes transmitted. ■ Drops—Number of packets dropped. ■ Errors—Number of packet errors. | extensive |
| DSU configuration | <p>Information about the DSU configuration. The last three lines (Bit count, Error bit count, and LOS information) are displayed only if a BERT has ever been run on the interface.</p> <ul style="list-style-type: none"> ■ Compatibility mode—CSU/DSU compatibility mode: None, Larscom, Kentrox, or Digital-Link. ■ Scrambling—Payload scrambling. It can be Enabled or Disabled. ■ Subrate—Configured subrate setting. Applies only when Digital-Link compatibility mode is used. It can be Disabled or display units in kbps. ■ FEAC loopback—(T3) Whether a far-end alarm and control (FEAC) loopback is Active or Inactive. This feature is used to send alarm or status information from the far-end terminal back to the near-end terminal and to initiate T3 loopbacks at the far-end terminal from the near-end terminal. ■ Response—Whether the FEAC signal is Enabled or Disabled. ■ Count—Number of FEAC loopbacks. | extensive |
| BERT configuration | <p>(DS interfaces) BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface.</p> <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |

Table 106: Channelized OC show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—The queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. ■ Bandwidth <i>bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. ■ Buffer <i>usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: <i>low</i> and <i>high</i>. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are <i>none</i> and <i>exact</i>. If <i>exact</i> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <i>none</i> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input rate—Rate of bits and packets received on the interface. ■ Output rate—Rate of bits and packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as <i>iso</i> , <i>inet6</i> , or <i>mpls</i> . | detail extensive none |

Table 106: Channelized OC show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| Multilink bundle | (If the logical interface is configured as part of a multilink bundle.) Interface name for the multilink bundle. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| DLCI | (Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags , Total down time , Last down , and Traffic statistics . Flags is one or more of the following: <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when the link is active, but no information is received from the DCE. ■ Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ Dce-configured—Displayed when the command is issued from the DTE. | detail extensive none |
| DLCI statistics | (Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

```

show interfaces      user@host> show interfaces extensive coc3-0/0/0
extensive (Channelized Physical interface: coc3-0/0/0, Enabled, Physical link is Down
OC3 IQ) (Physical)   Interface index: 128, SNMP ifIndex: 22, Generation: 11
                        Description: pink coc3-0/0/0
                        Link-level type: Controller, Clocking: Internal, SONET mode, Speed: OC3,
                        Loopback: None, Parent: None
                        Device flags   : Present Running Down
                        Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384
                        Link flags     : None
                        Hold-times     : Up 0 ms, Down 0 ms
                        CoS queues     : 4 supported
                        Last flapped   : 2005-01-27 16:39:21 PST (1w0d 22:09 ago)
                        Statistics last cleared: Never
                        SONET alarms   : PLL, LOS
                        SONET defects  : PLL, LOF, LOS, SEF, AIS-L

```



```

SONET PHY:           Seconds      Count  State
  PLL Lock           681767         1  PLL Lock Error
  PHY Light           0             0  OK
SONET section:
  BIP-B1              0             0
  SEF                 681767         1  Defect Active
  LOS                 681767         1  Defect Active
  LOF                 681767         1  Defect Active
  ES-S                681767
  SES-S               681767
  SEFS-S              681767
SONET line:
  BIP-B2              0             0
  REI-L               0             0
  RDI-L               0             0  OK
  AIS-L               681767         1  Defect Active
  BERR-SF              0             0  OK
  BERR-SD              0             0  OK
  ES-L                681767
  SES-L               681767
  UAS-L               681757
  ES-LFE              0
  SES-LFE              0
  UAS-LFE              0
Received SONET overhead:
  F1      : 0x00, J0      : 0x00, K1      : 0xff, K2      : 0xff
  S1      : 0xff
Transmitted SONET overhead:
  F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
  S1      : 0x00

```

**show interfaces
extensive (Channelized
OC1 on Channelized
OC3 IQ)**

```

user@host> show interfaces extensive coc1-0/0/0:1
Physical interface: coc1-0/0/0:1, Enabled, Physical link is Down
Interface index: 133, SNMP ifIndex: 27, Generation: 16
Link-level type: Controller, Clocking: Internal, SONET mode, Speed: 51840kbps,

  Loopback: None, Parent: coc3-0/0/0
Interface index 128
Device flags   : Present Running Down 16384
Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384
Link flags     : None
Hold-times     : Up 0 ms, Down 0 ms
CoS queues     : 4 supported
Last flapped   : 2005-02-04 14:51:07 PST (00:00:35 ago)
Statistics last cleared: Never
SONET alarms   : None
SONET defects  : AIS-P
SONET path:
  BIP-B3              0             0
  REI-P               0             0
  LOP-P               0             0  OK
  AIS-P               36             1  Defect Active
  RDI-P               0             0  OK
  UNEQ-P              0             0  OK
  PLM-P               0             0  OK
  ES-P                36
  SES-P               36
  UAS-P               26
  ES-PFE              0
  SES-PFE              0
  UAS-PFE              0

```

```

Received SONET overhead:
  C2      : 0xff, C2(cmp) : 0x01, F2      : 0x00, Z3      : 0x00
  Z4      : 0x00, S1(cmp) : 0x00
Transmitted SONET overhead:
  C2      : 0x01, F2      : 0x00, Z3      : 0x00, Z4      : 0x00
Received path trace:
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted path trace: router-1 coc1-0/0/0:1
  6b 61 76 65 72 69 20 63 6f 63 31 2d 30 2f 30 2f   router-1 coc1-0/0/0:1
  30 3a 31 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Packet Forwarding Engine configuration:
  Destination slot: 0 (0x00)

```

show interfaces
extensive (Channelized
T1 on Channelized OC3
IQ)

```

user@host> show interfaces extensive ct1-0/0/0:1:1
Physical interface: ct1-0/0/0:1:1, Enabled, Physical link is Down
Interface index: 134, SNMP ifIndex: 62, Generation: 17
Link-level type: Controller, Clocking: Internal, Speed: T1, Loopback: None,
Framing: ESF, Parent: coc1-0/0/0:1 Interface index 133
Device flags   : Present Running Down 16384
Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384
Link flags     : None
Hold-times     : Up 0 ms, Down 0 ms
CoS queues     : 4 supported
Last flapped   : 2005-02-04 14:54:35 PST (00:00:18 ago)
Statistics last cleared: Never
DS1 alarms     : None
DS1 defects    : AIS, LOF
T1 media:
  Seconds      Count  State
SEF            1       1 OK
BEE            1       1 OK
AIS           18       1 Defect Active
LOF           18       1 Defect Active
LOS            0       0 OK
YELLOW         0       0 OK
BPV            0       0
EXZ            0       0
LCV            0       0
PCV            0       0
CS             0       0
LES           18       0
ES            18       0
SES           18       0
SEFS          18       0
BES            0       0
UAS           14       0
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
SONET alarms    : None
SONET defects   : None
SONET vt:
  BIP-BIP2       0       0
  REI-V          0       0
  LOP-V          0       0 OK
  AIS-V          19       1 Defect Active
  RDI-V          19       1 Defect Active

```

```

UNEQ-V          0          0 OK
PLM-V           19         1 Defect Active
ES-V            19
SES-V           19
UAS-V           9
ES-VFE          0
SES-VFE         0
UAS-VFE         0
Received SONET overhead:
  V5      : 0x07, V5(cmp) : 0x02
Transmitted SONET overhead:
  V5      : 0x02
Packet Forwarding Engine configuration:
  Destination slot: 0 (0x00)

```

**show interfaces
extensive (DS0 on
Channelized OC3 IQ)**

```

user@host> show interfaces extensive ds-0/0/0:1:1:1
Physical interface: ds-0/0/0:1:1:1, Enabled, Physical link is Down
Interface index: 135, SNMP ifIndex: 63, Generation: 18
Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 320kbps,
Loopback: None, FCS: 16, Parent: ct1-0/0/0:1:1 Interface index 134
Device flags   : Present Running
Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384
Link flags     : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
CoS queues     : 4 supported
Last flapped   : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes   :          0          0 bps
  Output bytes  :          0          0 bps
  Input packets:          0          0 pps
  Output packets:        0          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0,
  L2 mismatch timeouts: 0, HS link CRC errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
  Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort          0              0              0
  1 expedited-fo         0              0              0
  2 assured-forw         0              0              0
  3 network-cont         0              0              0

HDLC configuration:
  Giant threshold: 1514, Runt threshold: 2
  Timeslots      : 1-5
  Byte encoding: Nx64K, Data inversion: Disabled, Idle cycle flag: flags,
  Start end flag: shared
DS0 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 4 (0x00)

```

show interfaces (Channelized OC12)

| | |
|---|---|
| Syntax | <pre>show interfaces t3-fpc/pic/port:t3channel <brief detail extensive terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified channelized OC12 interface. |
| Options | <p>t3-fpc/pic/port:t3channel—Display standard information about the specified channelized OC12 interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Channelized OC12) on page 536 |
| Output Fields | Table 106 on page 519 lists the output fields for the show interfaces (all channelized OC interfaces) command. Output fields are listed in the approximate order in which they appear. |
| show interfaces extensive (Channelized OC12) | <pre>user@host> show interfaces t3-0/3/0:0 extensive Physical interface: t3-0/3/0:0, Enabled, Physical link is Up Interface index: 32, SNMP ifIndex: 21, Generation: 2719 Link-level type: Frame-Relay, PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: T3, Loopback: None, SONET Loopback: None, FCS: 16, Mode: C/Bit parity Device flags : Present Running Interface flags: Point-To-Point SNMP-Traps Link flags : Keepalives DTE ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago) DTE statistics: Enquiries sent : 43186 Full enquiries sent : 8515 Enquiry responses received : 43185 Full enquiry responses received : 8515 DCE statistics: Enquiries received : 0 Full enquiries received : 0 Enquiry responses sent : 0 Full enquiry responses sent : 0</pre> |

```

Common statistics:
  Unknown messages received      : 0
  Asynchronous updates received  : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout    : 0
Nonmatching DCE-end DLCIs:
  2
Hold-times      : Up 0 ms, Down 0 ms
Last flapped    : 2002-05-23 16:59:03 PDT (18:23:58 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :      1700      0 bps
  Output bytes :     1714      0 bps
  Input packets:       123      0 pps
  Output packets:      124      0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 1100817, Bucket drops: 0,
  Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0,
  L2 mismatch timeouts: 0, HS link CRC errors: 0, SRAM errors: 0
Output errors:
  Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0
DS3 alarms : None
SONET alarms : None
DS3 defects : None
SONET defects : None
DS3 media:
  Seconds      Count  State
  AIS          0       0 OK
  LOF          18       1 OK
  LOS          0       0 OK
  IDLE         0       0 OK
  YELLOW       0       0 OK
  BPV          0       0
  EXZ          0       0
  LCV          0       0
  PCV          36     122399
  CCV          72     91948
  LES          0
  PES          18
  PSES         18
  CES          18
  CSES         18
  SEFS         18
  UAS          0
HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 4484, Runt threshold: 3
DSU configuration:
  Compatibility mode: None, Scrambling: Disabled, Subrate: Disabled
  FEAC loopback: Inactive, Response: Disabled, Count: 0
DS3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: Unknown (0), Induced error rate: 10e-0
Interface transmit queues:
  B/W  WRR      Packets      Bytes      Drops      Errors
  Queue0  95  95          0          0          0          0
  Queue1   5   5        529        6348          0          0
SONET PHY:
  Seconds      Count  State
  PLL Lock      0       0 OK
  PHY Light     20       1 OK
SONET section:

```

```

BIP-B1          0          0
SEF             20         1 OK
LOS             20         1 OK
LOF             20         1 OK
ES-S            20
SES-S            20
SEFS-S          20
SONET line:
BIP-B2          0          0
REI-L           0          0
RDI-L           0          0 OK
AIS-L           0          0 OK
BERR-SF         18         1 OK
BERR-SD          2         1 OK
ES-L            20
SES-L            20
UAS-L           10
ES-LFE          0
SES-LFE          0
UAS-LFE          0
SONET path:
BIP-B3          0          0
REI-P           0          0
LOP-P           20         1 OK
AIS-P           0          0 OK
RDI-P           0          0 OK
UNEQ-P          0          0 OK
PLM-P           20         1 OK
ES-P            20
SES-P            20
UAS-P           10
ES-PFE          0
SES-PFE          0
UAS-PFE          0
Received SONET overhead:
F1      : 0x00, J0      : 0x00, K1      : 0x00, K2      : 0x00
S1      : 0x00, C2      : 0x04, C2(cmp) : 0x04, F2      : 0x00
Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00, V5      : 0x00
V5(cmp) : 0x00
Transmitted SONET overhead:
F1      : 0x00, J0      : 0x01, K1      : 0x00, K2      : 0x00
S1      : 0x00, C2      : 0x04, F2      : 0x00, Z3      : 0x00
Z4      : 0x00, V5      : 0x00
Received path trace: t3-0/3/0:0
74 33 2d 30 2f 33 2f 30 3a 30 00 00 00 00 0d 0a  t3-0/3/0:0.....
Transmitted path trace: t3-0/3/0:0
74 33 2d 30 2f 33 2f 30 3a 30 00 00 00 00 00 00  t3-0/3/0:0.....
Packet Forwarding Engine configuration:
Destination slot: 0, PLP byte: 1 (0x00)
CoS transmit queue      Bandwidth      Buffer Priority  Limit
                        %      bps      %      usec
0 best-effort           95      42499200 95         0      low  none
3 network-control       5       2236800  5         0      low  none
Logical interface t3-0/3/0:0.0 (Index 11) (SNMP ifIndex 268) (Generation 499)
Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
Protocol inet, MTU: 4470, Generation: 578, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 22.22.22.1, Local: 22.22.22.2, Broadcast: Unspecified,
Generation: 98
DLCI 100

```

```
Flags: Active, Dce-configured
Total down time: 0 sec, Last down: Never
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
DLCI statistics:
  Active DLCI :2 Inactive DLCI : 0
```

show interfaces (Channelized OC12 IQ and IQE)

Syntax show interfaces (*type-fpc/pic/port<:channel><:channel><:channel>*)
 <brief | detail | extensive | terse>
 <descriptions>
 <media>
 <snmp-index *snmp-index*>
 <statistics>

Release Information Command introduced before JUNOS Release 7.4.

Description (M-series and T-series routing platforms only) Display status information about the specified channelized OC12 IQ and IQE interface.

Options *type-fpc/pic/port:channel:channel:channel*—Interface type with optional corresponding channel levels.

For SONET mode, the interface type can be one of the following:

- *type-fpc/pic/port*—For the physical channelized OC12 IQ or IQE interface, *type* is *coc12*. For the clear channel, *type* is *so* (for OC12).
- *type-fpc/pic/port:channel*—At the first level of channelization, *type* can be *coc1*(channelized OC1), *ct3* (from *coc1*), *so* (for OC3), or *t3*.
- *type-fpc/pic/port:channel:channel*—At the second level of channelization, *type* can be *ct1* (from *ct3* or *coc1*) or *t1* (from *ct3* or *coc1*).
- *type-fpc/pic/port:channel:channel:channel*—At the third level of channelization, *type* is *ds* (from *ct1*).

For SDH mode, the interface type can be one of the following:

- *type-fpc/pic/port*—For the physical channelized OC12 IQ or IQE interface, *type* is *cstm4*. For the clear channel, *type* is *so* (for SONET/SDH (vc-4-4c)).
- *type-fpc/pic/port:channel*—At the first level of channelization, *type* can be *so* (from *cstm4*) or *cau4* (from *cstm4*).
- *type-fpc/pic/port:channel:channel*—At the second level of channelization, *type* can be *ct3* or *t3* (from *cau4*).
- *type-fpc/pic/port:channel:channel:channel*—At the third level of channelization, *type* is *ct1* or *t1* (from *ct3*).
- *type-fpc/pic/port:channel:channel:channel:channel*—At the fourth level of channelization, *type* is *ds* (from *ct1*).

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

`snmp-index snmp-index`—(Optional) Display information for the specified SNMP index of the interface.

`statistics`—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output `show interfaces extensive` (CAU4 on Channelized OC-12 IQ) on page 541
`show interfaces extensive` (Channelized OC1 on Channelized OC12 IQ) on page 541
`show interfaces extensive` (Channelized OC12 IQ) (Physical) on page 541
`show interfaces extensive` (Channelized T1 from Channelized OC12 IQ) on page 542
`show interfaces extensive` (Channelized T3 on Channelized OC12 IQ) on page 542
`show interfaces extensive` (CSTM4 on Channelized OC-12 IQ) on page 542
`show interfaces extensive` (DS0 on Channelized OC12 IQ) on page 542
`show interfaces extensive` (SONET Interface on Channelized OC12 IQ) on page 542
`show interfaces extensive` (T1 on Channelized OC12 IQ) on page 543

Output Fields Table 106 on page 519 lists the output fields for the `show interfaces` (all channelized OC interfaces) command. Output fields are listed in the approximate order in which they appear.

**show interfaces
extensive (CAU4 on
Channelized OC-12 IQ)**

```
user@host> show interfaces cau4-0/2/0:1 extensive
Physical interface: cau4-0/2/0:1, Enabled, Physical link is Up
  Interface index: 219, SNMP ifIndex: 139, Generation: 221
  Link-level type: Controller, Clocking: Internal, SDH mode, Speed: OC3,
  Loopback: None, Parent: cstm4-0/2/0 Interface index 216
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : None
...
```

**show interfaces
extensive (Channelized
OC1 on
Channelized OC12 IQ)**

```
user@host> show interfaces extensive coc1-4/2/0:7
Physical interface: coc1-4/2/0:7, Enabled, Physical link is Up
  Interface index: 381, SNMP ifIndex: 2524, Generation: 728
  Link-level type: Controller, MTU: 4474, Clocking: Internal, SONET mode,
  Speed: 51840kbps, Loopback: None,
  FCS: 16, Payload scrambler: Disabled, Parent: coc12-4/2/0 (Index 266)
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
...
```

**show interfaces
extensive (Channelized
OC12 IQ) (Physical)**

```
user@host> show interfaces extensive coc12-4/2/0
Physical interface: coc12-4/2/0, Enabled, Physical link is Up
  Interface index: 266, SNMP ifIndex: 1269, Generation: 601
  Link-level type: Controller, MTU: 4474, Clocking: Internal, SONET mode,
  Speed: OC12, Loopback: None,
  FCS: 16, Payload scrambler: Disabled, Parent: None Device flags   : Present
Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives DTE
...
```

```

show interfaces      user@host> show interfaces extensive ct1-4/2/0:7:1
extensive (Channelized Physical interface: ct1-4/2/0:4:1, Enabled, Physical link is Up
T1 from Channelized   Interface index: 305, SNMP ifIndex: 2410, Generation: 640
OC12 IQ)             Link-level type: Controller, MTU: 1504, Clocking: Internal, Speed: T1,
                        Loopback: None, FCS: 16,
                        Framing: ESF, Parent: coc1-4/2/0:7 (Index 304)
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps
                        Link flags     : None
                        ...

show interfaces      user@host> show interfaces ct3-0/2/0:1 extensive
extensive (Channelized Physical interface: ct3-0/2/0:1:1, Enabled, Physical link is Up
T3 on Channelized   Interface index: 220, SNMP ifIndex: 140, Generation: 222
OC12 IQ)           Link-level type: Controller, Clocking: Internal, Speed: T3, Loopback: None,
                        Mode: C/Bit parity, Parent: cau4-0/2/0:1 Interface index 219
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                        Link flags     : None
                        ...

show interfaces      user@host> show interfaces cstm4-0/2/0 extensive
extensive (CSTM4 on   Physical interface: cstm4-0/2/0, Enabled, Physical link is Up
Channelized OC12 IQ) Interface index: 216, SNMP ifIndex: 33, Generation: 218
                        Link-level type: Controller, Clocking: Internal, SDH mode, Speed: OC12,
                        Loopback: None, Parent: None Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                        Link flags     : None
                        ...

show interfaces      user@host> show interfaces extensive ds-4/2/0:7:1:1
extensive (DS0 on    Physical interface: ds-4/2/0:4:1:1, Enabled, Physical link is Up
Channelized OC12 IQ) Interface index: 306, SNMP ifIndex: 2411, Generation: 641
                        Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 64kbps,
                        Loopback: None, FCS: 16, Parent: ct1-4/2/0:7:1 (Index 305)
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps
                        Link flags     : Keepalives
                        ...

show interfaces      user@host> show interfaces so-0/2/0:1 extensive
extensive           Physical interface: so-0/2/0:1, Enabled, Physical link is Up
(SONET Interface on   Interface index: 750, SNMP ifIndex: 23, Generation: 11709
Channelized OC12 IQ) Link-level type: Multilink-FR, MTU: 4474, Clocking: Internal, SONET mode,
                        Speed: OC3, Loopback: None, FCS: 16,
                        Payload scrambler: Enabled, Parent: coc12-0/2/0 Interface index 749
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                        Link flags     : Keepalives DTE
                        ...

```

```

show interfaces      user@host> show interfaces t1-0/2/0:1:1:1 extensive
extensive (T1 on      Physical interface: t1-0/2/0:1:1:1, Enabled, Physical link is Up
Channelized OC12 IQ) Interface index: 222, SNMP ifIndex: 143, Generation: 226
                        Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
                        Loopback: None, FCS: 16, Framing: ESF, Parent: ct3-0/2/0:1:1
                        Interface index 221
                        Device flags      : Present Running
                        Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
                        Link flags       : Keepalives
                        ...

```

show interfaces controller (Channelized OC3 IQ and IQE)

| | |
|---------------------------------|---|
| Syntax | show interfaces controller <i>coc3-fpc/pic/slot</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display a list of channels configured on a channelized OC3 IQ and IQE interface. |
| Options | <i>coc3-fpc/pic/slot</i> —channelized OC3 IQ or IQE interface name. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces controller (Channelized OC3 IQ) on page 544 |
| Output Fields | Table 107 on page 544 lists the output fields for the <code>show interfaces controller</code> (Channelized OC3 IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 107: channelized OC3 IQ and IQE show interfaces controller Output Fields

| Field Name | Field Description |
|------------|---|
| Controller | Physical channelized interface name and the names of any channels configured on it. |
| Admin | Administrative status of the interface. |
| Link | Link status of the interface. |

| | | |
|--|--|---|
| show interfaces controller (Channelized OC3 IQ) | <pre> user@host> show interfaces controller coc3-4/2/0 Controller coc3-4/2/0 coc1-4/2/0:1 ct1-4/2/0:1:1 ds-4/2/0:1:1:1 ct3-0/2/0 ct3-0/2/1 ct3-0/2/2 ct3-0/2/3 </pre> | <pre> Admin Link up up up up up up up up up up up up up up up up </pre> |
|--|--|---|

show interfaces controller (Channelized OC12 IQ and IQE)

Syntax show interfaces controller *coc12-fpc/pic/port*

Release Information Command introduced before JUNOS Release 7.4.

Description Display a list of channels configured on a channelized OC12 IQ or IQE interface.

Options `coc12-fpc/pic/slot`—Channelized OC12 IQ or IQE interface name.

Required Privilege Level [view](#)

List of Sample Output show interfaces controller (Channelized OC12 IQ) on page 545

Output Fields Table 108 on page 545 lists the output fields for the **show interfaces controller** (Channelized OC12 IQ and IQE) command. Output fields are listed in the approximate order in which they appear.

Table 108: Channelized OC12 IQ and IQE show interfaces controller Output Fields

| Field Name | Field Description |
|------------|---|
| Controller | Physical channelized interface name and the names of any channels configured on it. |
| Admin | Administrative status of the interface. |
| Link | Link status of the interface. |

| show interfaces controller | | Admin | Link |
|----------------------------------|-----------------|-------|------|
| controller (Channelized OC12 IQ) | coc12-4/2/0 | up | up |
| | so-4/2/0:1 | up | up |
| | t3-4/2/0:2 | up | up |
| | ct3-4/2/0:3 | up | up |
| | t1-4/2/0:3:1 | up | up |
| | t1-4/2/0:3:2 | up | up |
| | ... | | |
| | t1-4/2/0:3:28 | up | up |
| | ct3-4/2/0:4 | up | up |
| | ct1-4/2/0:4:1 | up | up |
| | ds-4/2/0:4:1:1 | up | up |
| | ds-4/2/0:4:1:2 | up | up |
| | ... | | |
| | ds-4/2/0:4:1:24 | up | up |
| | ct1-4/2/0:4:2 | up | up |
| | ds-4/2/0:4:2:1 | up | up |
| | ds-4/2/0:4:2:2 | up | up |
| | ... | | |
| | ds-4/2/0:4:2:6 | up | up |
| | t1-4/2/0:4:3 | up | up |
| | t1-4/2/0:4:4 | up | up |
| | ... | | |
| | t1-4/2/0:4:28 | up | up |

| | | |
|-----------------|----|----|
| t3-4/2/0:5 | up | up |
| coc1-4/2/0:6 | up | up |
| t1-4/2/0:6:1 | up | up |
| t1-4/2/0:6:2 | up | up |
| ... | | |
| t1-4/2/0:6:28 | up | up |
| coc1-4/2/0:7 | up | up |
| ct1-4/2/0:7:1 | up | up |
| ds-4/2/0:7:1:1 | up | up |
| ds-4/2/0:7:1:2 | up | up |
| ... | | |
| ds-4/2/0:7:1:24 | up | up |
| ct1-4/2/0:7:2 | up | up |
| ds-4/2/0:7:2:1 | up | up |
| ds-4/2/0:7:2:2 | up | up |
| ... | | |
| ds-4/2/0:7:2:6 | up | up |
| t1-4/2/0:7:3 | up | up |
| t1-4/2/0:7:4 | up | up |
| ... | | |
| t1-4/2/0:7:28 | up | up |
| so-4/2/0:8 | up | up |

Chapter 17

Channelized STM1 Interface Operational Mode Commands

Table 109 on page 547 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot channelized STM1 interfaces. Commands are listed in alphabetical order.

Table 109: Channelized STM1 Interface Operational Mode Commands

| Task | Command |
|--|--|
| Display status information about channelized STM1 interfaces. | show interfaces (Channelized STM1) |
| Display channelized STM1 IQ interface information. | show interfaces (Channelized STM1 IQ) |
| Display the interface names of the physical channelized STM1 IQ interface and the channels configured on each interface. | show interfaces controller (Channelized STM1 IQ) |



NOTE: For more information about the channel type and level of channelization, and for information about the number of channels that are supported on the channelized STM1 interface, see the *JUNOS Network Interfaces Configuration Guide*.

For channelization illustrations and configuration examples for channelized IQ interfaces, see the *JUNOS Feature Guide*.

show interfaces (Channelized STM1)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>e1-fpc/pic/port:e1channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified channelized STM1 interface. |
| Options | <p><i>e1-fpc/pic/port:e1channel</i>—Display standard status information about the specified channelized STM1 interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Channelized STM1, SDH) on page 558 |
| Output Fields | Table 110 on page 548 lists the output fields for the show interfaces (all Channelized STM1 interfaces) command. Output fields are listed in the approximate order in which they appear. |

Table 110: Channelized STM1 show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |

Table 110: Channelized STM1 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|----------------------|--|-----------------------|
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source. It can be Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Framing | Physical layer framing format used on the link. It can be G704 , G704-NO-CRC4 , or Unframed . The default is G704 . | All levels |
| Parent | (Channelized STM1 IQ interfaces only) Name and interface index of the interface to which a particular child interface belongs. None indicates that this interface is the top level. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ intervalseconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count number—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive none |
| Keepalive statistics | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format hh:mm:ss. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format hh:mm:ss. | detail extensive none |

Table 110: Channelized STM1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---|--|-----------------------|
| ANSI LMI settings or ITU LMI settings | <p>(Frame Relay) Local Management Interface settings. The format is (ANSI or ITU) LMI settings: <i>value, value...</i> xx seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1- 255) ■ n392dce—DCE error threshold (1-10) ■ n392dte—DTE error threshold (1-10) ■ n393dce—DCE monitored event count (1-10) ■ n393dte—DTE monitored event count (1-10) ■ t391dte—DTE polling timer (5-30 seconds) ■ t392dce—DCE polling verification timer (5-30 seconds) | detail extensive none |
| LMI | <p>(Frame Relay) Statistics about the link management.</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: <i>nn</i> (last seen <i>hh:mm:ss ago</i>). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: <i>nn</i> (last seen <i>hh:mm:ss ago</i>). | detail extensive none |
| DTE statistics | <p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data circuit-terminating equipment (DCE):</p> <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |
| DCE statistics | <p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |

Table 110: Channelized STM1 show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Common statistics | <p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no LMI packet was reported for n392dte or n393dce intervals. (See LMI settings.) | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay, displayed only from the DTE) Number of DLCIs configured from the DCE. | detail extensive none |
| LCP state | <p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | <p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive none |

Table 110: Channelized STM1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|------------------|
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ SRAM errors—Number of hardware errors that occurred in the static RAM (SRAM) on the PIC. If the value of this field increments, the PIC is malfunctioning. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. | extensive |

Table 110: Channelized STM1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| DS1 alarms DS1 defects | <p>E1 media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. The following lists all possible alarms and defects. For complete explanations of most of these alarms and defects, see <i>Bellcore Telcordia GR-499-CORE</i>.</p> <ul style="list-style-type: none"> ■ LOS—Loss of signal. ■ LOF—Loss of frame. ■ AIS—Alarm indication signal. ■ YLW—Yellow alarm. Indicates errors at the remote site receiver. | detail extensive none |
| SDH alarms SDH defects | <p>SDH media-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SDH PHY, SDH regenerator section, SDH multiplex section, and SDH path.</p> | All levels |
| E1 media | <p>Active alarms and defects, plus counts of specific E1 errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Error types can be:</p> <ul style="list-style-type: none"> ■ AIS—Alarm indication signal ■ BEE—Bit error ■ BES—Bit error seconds ■ BPV—Bipolar violation ■ CS—Carrier state ■ ES—Errored seconds ■ EXZ—Excessive zeros ■ FEBE—Far-end block error ■ LCV—Line code violation ■ LES—Line error seconds ■ LOF—Loss of frame ■ LOS—Loss of signal ■ PCV—Pulse code violation ■ SEF—Severely errored framing ■ SEFS-S—Severely errored framing seconds (section) ■ SES—Severely errored seconds ■ UAS—Unavailable seconds ■ YELLOW—Errors at the remote site receiver | extensive |

Table 110: Channelized STM1 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Interface transmit queues | Names of the transmit queues and their associated statistics for each E1 channel on the Channelized STM1-to-E1 PIC. <ul style="list-style-type: none"> ■ B/W—Queue bandwidth as a percentage of the total interface bandwidth. ■ WRR—Weighted round-robin (in percent). ■ Packets—Number of packets transmitted. ■ Bytes—Number of bytes transmitted. ■ Drops—Number of packets dropped. ■ Errors—Number of packet errors. | extensive |
| HDLC configuration | Information about the HDLC configuration. <ul style="list-style-type: none"> ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Timeslots—Configured time slots for the interface. ■ Line encoding—Line encoding used. It is always HDB3. | extensive |
| DS1 BERT configuration | BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface. <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |
| SDH PHY | Active alarms and defects, plus counts of specific SDH errors with detailed information. <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop ■ PHY Light—Loss of optical signal | extensive |

Table 110: Channelized STM1 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------|
| SDH regenerator section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ RS-BIP8—24-bit BIP for multiplex section overhead (B2 bytes) ■ OOF—Out of frame ■ LOS—Loss of signal ■ LOF—Loss of frame ■ RS-ES—Errored seconds (near-end regenerator section) ■ RS-SES—Severely errored seconds (near-end regenerator section) ■ RS-SEFS—Severely errored framing seconds (regenerator section) | extensive |
| SDH multiplex section | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ MS-BIP24—8-bit BIP for high-order path overhead (B3 byte) ■ MS-FEBE—Far-end block error (multiplex section) ■ MS-FERF—Far-end remote fail (multiplex section) ■ MS-AIS—alarm indication signal (multiplex section) ■ BERR-SF—Bit error rate fault (signal failure) ■ BERR-SD—Bit error rate defect (signal degradation) ■ MS-ES—Errored seconds (near-end multiplex section) ■ MS-SES—Severely errored seconds (near-end multiplex section) ■ MS-UAS—Unavailable seconds (near-end multiplex section) ■ MS-ES-FE—Errored seconds (far-end multiplex section) ■ MS-SES-FE—Severely errored seconds (far-end multiplex section) ■ MS-UAS-FE—Unavailable seconds (far-end multiplex section) | extensive |

Table 110: Channelized STM1 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------|---|-----------------|
| SDH path | <p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ HP-BIP8—8-bit BIP for regenerator section overhead (B1 byte) ■ HP-FEBE—Far-end block error (high-order path) ■ HP-LOP—Loss of pointer (high-order path) ■ HP-AIS—High-order-path alarm indication signal ■ HP-FERF—Far-end remote fail (high-order path) ■ HP-UNEQ—Unequipped (high-order path) ■ HP-PLM—Payload label mismatch (high-order path) ■ HP-ES—Errored seconds (near-end high-order path) ■ HP-SES—Severely errored seconds (near-end high-order path) ■ HP-UAS—Unavailable seconds (near-end high-order path) ■ HP-ES-FE—Errored seconds (far-end high-order path) ■ HP-SES-FE—Severely errored seconds (far-end high-order path) ■ HP-UAS-FE—Unavailable seconds (far-end high-order path) | extensive |
| SDH tu | <p>Active alarms and defects, plus counts of specific SDH tributary unit (TU) errors with detailed information.</p> <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> ■ TU-BIP-2—Bit interleaved parity for SONET line overhead ■ TU-FEBE—(near-end TU) ■ TU-LOP—Loss of pointer (near-end TU) ■ TU-AIS—Alarm indication signal (near-end TU) ■ TU-FERF—(near-end TU) ■ TU-UNEQ—Unequipped (near-end TU) ■ TU-PLM—Payload label mismatch (near-end TU) ■ TU-ES—Errored seconds (near-end TU) ■ TU-SES—Severely errored seconds (near-end TU) ■ TU-UAS—Unavailable seconds (near-end TU) ■ TU-ES-FE—Errored seconds (far-end TU) ■ TU-SES-FE—Severely errored seconds (far-end TU) ■ TU-UAS-FE—Unavailable seconds (far-end TU) | extensive |

Table 110: Channelized STM1 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Received SDH overhead | Values of the received and transmitted SONET overhead: | extensive |
| Transmitted SDH overhead | <ul style="list-style-type: none"> ■ C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. ■ F1—Section user channel byte. This byte is set aside for the purposes of users. ■ K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. ■ J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. ■ S1—Synchronization status. The S1 byte is located in the first STS-1 of an STS-N signal. ■ Z3 and Z4—Allocated for future use. | |
| Received path trace | Channelized OC12 interfaces allow path trace bytes to be sent inband across the SONET/SDH link. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits. This information is specific to each of the 12 channelized OC12 interfaces. | extensive |
| Transmitted path trace | | |
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—Queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. ■ <i>Bandwidth bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. ■ <i>Buffer usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ <i>Priority</i>—Queue priority: <i>low</i> or <i>high</i>. ■ <i>Limit</i>—Displayed if rate limiting is configured for the queue. Possible values are <i>none</i> and <i>exact</i>. If <i>exact</i> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <i>none</i> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |

Table 110: Channelized STM1 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Protocol | Protocol family configured on the logical interface, such as iso, inet6, or mpls. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| DLCI | (Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags , Total down time , Last down , and Traffic statistics . Flags is one or more of the following: <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when the link is active, but no information is received from the DCE. ■ Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ Dce-configured—Displayed when the command is issued from the DTE. | detail extensive none |
| DLCI statistics | (Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

**show interfaces
extensive (Channelized
STM1, SDH)**

```

user@host> show interfaces e1-1/0/0:1 extensive
Physical interface: e1-1/0/0:1, Enabled, Physical link is Up
Interface index: 148, SNMP ifIndex: 285, Generation: 2915
Link-level type: Frame-relay, MTU: 1504, SDH mode, Speed: E1, Loopback: None,
FCS: 16, Framing: G704
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags    : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago)

```

```

DTE statistics:
  Enquiries sent           : 43186
  Full enquiries sent      : 8515
  Enquiry responses received : 43185
  Full enquiry responses received : 8515
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 0
Nonmatching DCE-end DLCIs:
  2
Hold-times      : Up 0 ms, Down 0 ms
Last flapped   : 2002-05-23 17:02:59 PDT (17:23:45 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          592          48 bps
  Output bytes :          644          48 bps
  Input packets:          46           0 pps
  Output packets:         46           0 pps
Input errors:
  Errors: 0, Drops: 9, Framing errors: 0, Policed discards: 0,
  L3 incompletes: 0, L2 channel errors: 11, L2 mismatch timeouts: 0,
  HS link CRC errors: 0, SRAM errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0
DS1  alarms : None
DS1  defects : None
SDH  alarms : None
SDH  defects : None
E1  media:
      Seconds      Count  State
SEF           0         0  OK
BEE           0         0  OK
AIS          124         1  OK
LOF          124         1  OK
LOS           0         0  OK
YELLOW        0         0  OK
BPV           0         0
EXZ           0         0
LCV           0         0
PCV           0         0
CS            0         0
FEBE          0         0
LES          124
ES           125
SES          124
SEFS         124
BES           0
UAS           37
Interface transmit queues:
      B/W  WRR      Packets      Bytes      Drops      Errors
Queue0   95  95         0         0         0         0
Queue1    5   5       529      6348         0         0
HDLC configuration:
  Giant threshold: 0, Runt threshold: 0
  Timeslots      : All active

```

```

Line encoding: HDB3
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
SDH PHY:
  Seconds      Count  State
  PLL Lock      0      0 OK
  PHY Light      0      0 OK
SDH regenerator section:
  RS-BIP8        0      0
  OOF            125     1 OK
  LOS            125     1 OK
  LOF            125     1 OK
  RS-ES          125
  RS-SES         125
  RS-SEFS        125
SDH multiplex section:
  MS-BIP24        0      0
  MS-FEBE         0      0
  MS-FERF         0      0 OK
  MS-AIS          125     1 OK
  BERR-SF         0      0 OK
  BERR-SD         0      0 OK
  MS-ES           125
  MS-SES          125
  MS-UAS          115
  MS-ES-FE        0
  MS-SES-FE       0
  MS-UAS-FE       0
SDH path:
  HP-BIP8         0      0
  HP-FEBE         0      0
  HP-LOP          0      0 OK
  HP-AIS          125     1 OK
  HP-FERF         0      0 OK
  HP-UNEQ         0      0 OK
  HP-PLM          125     1 OK
  HP-ES           125
  HP-SES          125
  HP-UAS          115
  HP-ES-FE        0
  HP-SES-FE       0
  HP-UAS-FE       0
SDH tu:
  TU-BIP2         0      0
  TU-FEBE         124     1
  TU-LOP          0      0 OK
  TU-AIS          124     1 OK
  TU-FERF         124     1 OK
  TU-UNEQ         0      0 OK
  TU-PLM          124     1 OK
  TU-ES           125
  TU-SES          125
  TU-UAS          115
  TU-ES-FE        0
  TU-SES-FE       0
  TU-UAS-FE       0
Received SDH overhead:
  F1      : 0x00, J0      : 0x00, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0x02, C2(cmp) : 0x02, F2      : 0x00
  Z3      : 0x00, Z4      : 0x00, S1(cmp) : 0x00, V5      : 0x02
  V5(cmp) : 0x02

```

```

Transmitted SDH overhead:
  F1      : 0x00, J0      : 0x00, K1      : 0x00, K2      : 0x00
  S1      : 0x00, C2      : 0x02, F2      : 0x00, Z3      : 0x00
  Z4      : 0x00, V5      : 0x02
Received path trace:
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted path trace:
  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Packet Forwarding Engine configuration:
  Destination slot: 1, PLP byte: 2 (0x07)
  CoS transmit queue      Bandwidth      Buffer Priority  Limit
                           %      bps      %      usec
  0 best-effort            95      1945600  95      0      low  none
  3 network-control        5      102400   5      0      low  none
Logical interface e1-1/0/0:1.0 (Index 10) (SNMP ifIndex 369) (Generation 496)
Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 575, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 19.19.19.3, Local: 19.19.19.4, Broadcast: Unspecified,
  Generation: 975
DLCI 100
Flags: Active, Dce-configured
Total down time: 0 sec, Last down: Never
Traffic statistics:
  Input bytes : 0
  Output bytes : 0
  Input packets: 0
  Output packets: 0
DLCI statistics:
  Active DLCI :2 Inactive DLCI : 0

```

show interfaces (Channelized STM1 IQ)

| | |
|---|---|
| Syntax | show interfaces (<i>type-fpc/pic /port <:channel><:channel></i>) <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified channelized STM1 IQ interface. |
| Options | <p><i>type-fpc/pic/port:channel:channel</i>—Interface type with optional corresponding channel levels. The interface type can be one of the following:</p> <ul style="list-style-type: none"> ■ <i>type-fpc/pic/port:channel</i>—For the physical channelized STM1 IQ interface, <i>type</i> is <i>cstm1</i>. For the clear channel, <i>type</i> is <i>so</i>. For channelization, the STM1 IQ interface must be converted to interface type <i>cau4</i>. ■ <i>type-fpc/pic/port:channel</i>—At the first level of channelization, <i>type</i> can be <i>ce1</i> or <i>e1</i> (clear channel or fractional channel from <i>cau4</i>). ■ <i>type-fpc/pic/port:channel:channel</i>—At the second level of channelization, <i>type</i> is <i>ds</i> (from <i>ce1</i>). <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Channelized STM1 IQ) (Physical) on page 562</p> <p>show interfaces (Channelized AU-4) (Physical) on page 563</p> <p>show interfaces (Channelized E1) (Physical) on page 563</p> <p>show interfaces (DS) on page 564</p> |
| Output Fields | Table 110 on page 548 lists the output fields for the show interfaces (all Channelized STM1 interfaces) command. Output fields are listed in the approximate order in which they appear. |
| show interfaces (Channelized STM1 IQ) (Physical) | <pre> user@host> show interfaces cstm1-0/0/0 Physical interface: cstm1-0/0/0, Enabled, Physical link is Up Interface index: 146, SNMP ifIndex: 35 Link-level type: Frame-relay, Controller, Clocking: Internal, SDH mode, Speed: OC3, Loopback: None, Parent: None Device flags : Present Running </pre> |

```

Interface flags: Point-To-Point SNMP-Traps
Link flags      : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago)
DTE statistics:
  Enquiries sent           : 43186
  Full enquiries sent      : 8515
  Enquiry responses received : 43185
  Full enquiry responses received : 8515
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 0
Nonmatching DCE-end DLCIs:
  2
Last flapped : 2003-02-06 15:01:56 PST (07:15:06 ago)
...

```

show interfaces
(Channelized AU-4)
(Physical)

```

user@host> show interfaces cau4-0/0/0
Physical interface: cau4-0/0/0, Enabled, Physical link is Up
Interface index: 147, SNMP ifIndex: 36
Link-level type: Controller, Clocking: Internal, SDH mode, Speed: OC3,
Loopback: None, Parent: cstm1-0/0/0 Interface index 146
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags   : None
Last flapped : 2003-02-06 19:36:31 PST (02:40:42 ago)
SDH alarms  : None
SDH defects  : None
...

```

show interfaces
(Channelized E1)
(Physical)

```

user@host> show interfaces ce1-0/0/0:11
Physical interface: ce1-0/0/0:11, Enabled, Physical link is Up
Interface index: 169, SNMP ifIndex: 288
Link-level type: Frame-relay, Controller, Clocking: Internal, Speed: E1,
Loopback: None, Framing: G704, Parent: cau4-0/0/0 Interface index 147
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags   : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago)
DTE statistics:
  Enquiries sent           : 43186
  Full enquiries sent      : 8515
  Enquiry responses received : 43185
  Full enquiry responses received : 8515
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0

```

```

    Keepalive responses timedout      : 0
Nonmatching DCE-end DLCIs:
    2
Last flapped      : 2003-02-06 22:05:23 PST (00:13:45 ago)
DS1  alarms      : None
DS1  defects     : None
SDH   alarms     : None
SDH   defects    : None
...

```

show interfaces (DS)

```

user@host> show interfaces ds-0/0/0:11:1
Physical interface: ds-0/0/0:11:1, Enabled, Physical link is Up
  Interface index: 170, SNMP ifIndex: 289
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 640kbps,
  Loopback: Illegal, FCS: 16, Parent: ce1-0/0/0:11 Interface index 169
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 0 (never), Output: 0 (never)
  LCP state: Conf-req-sent
...
  Logical interface ds-0/0/0:11:1.0 (Index 77) (SNMP ifIndex 290)
    Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
    Bandwidth: 0
    Protocol inet, MTU: 1500
    Flags: Protocol-Down
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
      Destination: 10.134.1.0/30, Local: 10.134.1.1
  DLCI 100
    Flags: Active, Dce-configured
    Total down time: 0 sec, Last down: Never
    Traffic statistics:
      Input bytes      : 0
      Output bytes     : 0
      Input packets    : 0
      Output packets   : 0
...

```


show interfaces controller (Channelized STM1 IQ)

| | |
|---------------------------------|---|
| Syntax | show interfaces controller cstm1-fpc/pic/port |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display the interface names of the physical channelized STM1 IQ interface and the channels configured on each interface. |
| Options | cstm1-fpc/pic/slot—Channelized STM1 IQ interface name. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces controller (Physical Channelized STM1 IQ with Logical E1) on page 565 |
| Output Fields | Table 111 on page 565 lists the output fields for the show interfaces controller (Channelized STM1 IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 111: Channelized STM1 IQ show interfaces controller Output Fields

| Field Name | Field Description |
|------------|---|
| Controller | Physical channelized interface name and the names of any channels configured on it. |
| Admin | Administrative status of the interface. |
| Link | Link status of the interface. |

| | | | |
|--|---|--|------------|
| show interfaces controller (Physical Channelized STM1 IQ with Logical E1) | user@host> show interfaces controller cstm1-0/0/0 | | |
| | Controller | | Admin Link |
| | cstm1-0/0/0 | | up up |
| | cau4-0/0/0 | | up up |
| | e1-0/0/0:1 | | up up |
| | e1-0/0/0:2 | | up up |
| | e1-0/0/0:3 | | up up |
| | e1-0/0/0:4 | | up up |
| | e1-0/0/0:5 | | up up |
| | e1-0/0/0:6 | | up up |
| | e1-0/0/0:7 | | up up |
| | e1-0/0/0:8 | | up up |
| | e1-0/0/0:9 | | up up |
| | e1-0/0/0:10 | | up up |
| | ce1-0/0/0:11 | | up up |
| | ds-0/0/0:11:1 | | up up |
| | ds-0/0/0:11:2 | | up up |
| | ds-0/0/0:11:3 | | up up |
| | ds-0/0/0:11:4 | | up up |

Chapter 18

Channelized T1 and T3 Interface Operational Mode Commands

Table 112 on page 567 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot channelized T1 and T3 interfaces. Commands are listed in alphabetical order.

Table 112: Channelized T1 and T3 Interface Operational Mode Commands

| Task | Command |
|--|--|
| Display status information about channelized DS3-to-DS0 interfaces. | show interfaces (Channelized DS3-to-DS0) |
| Display status information about channelized DS3-to-DS1 interfaces. | show interfaces (Channelized DS3-to-DS1) |
| Display channelized T1 IQ interface information. | show interfaces (Channelized T1 IQ) |
| Display channelized T3 IQ interface information. | show interfaces (Channelized T3 IQ) |
| Display the interface names of the physical channelized T1 IQ interface and the channels configured on each interface. | show interfaces controller (Channelized T1 IQ) |
| Display the interface names of the physical channelized T3 IQ interface and the channels configured on each interface. | show interfaces controller (Channelized T3 IQ) |



NOTE: For more information about the channel type and level of channelization, and for information about the number of channels that are supported on the different types of channelized T1 and T3 interfaces, see the *JUNOS Network Interfaces Configuration Guide*.

For more information on monitoring and troubleshooting channelized DS3-to-DS0 and DS3-to-DS1 interfaces, see the *JUNOS Interfaces Network Operations Guide*.

For channelization illustrations and configuration examples for channelized IQ interfaces, see the *JUNOS Feature Guide*.

show interfaces (Channelized DS3-to-DS0)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>ds-fpc/pic/port:t1channel:ds0channel</i> <brief detail extensive> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified channelized DS3-to-DS0 interface. |
| Options | <p><i>ds-fpc/pic/port:t1channel:ds0channel</i>—Display standard information about the specified channelized DS3-to-DS0 interface.</p> <p><i>brief detail extensive</i>—(Optional) Display the specified level of output interface.</p> <p><i>descriptions</i>—(Optional) Display interface description strings.</p> <p><i>media</i>—(Optional) Display media-specific information about network interfaces.</p> <p><i>snmp-index snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><i>statistics</i>—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Channelized DS3-to-DS0) on page 576 |
| Output Fields | Table 113 on page 568 lists the output fields for the show interfaces (all Channelized DS3 interfaces) command. Output fields are listed in the approximate order in which they appear. |

Table 113: Channelized DS3 show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |

Table 113: Channelized DS3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------------|
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source. It can be Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Mode | Whether C-bit parity mode or M13 mode is enabled. | All levels |
| Framing | Physical layer framing format used on the link. It can be ESF or SF . The default is ESF . | All levels |
| Parent | (Channelized IQ interfaces only) Name and interface index of the interface to which a particular child interface belongs. None indicates that this interface is the top level. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | (PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval seconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count number—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive none |
| Keepalive statistics | (PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format hh:mm:ss. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format hh:mm:ss. | detail extensive none |

Table 113: Channelized DS3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------|--|-----------------------|
| LMI settings | <p>(Frame Relay) Settings for Local Management Interface (LMI) can be either ANSI LMI settings or ITU LMI settings. ANSI LMI settings is the default. The format is (ANSI or ITU) LMI settings: <i>value</i>, <i>value</i>, <i>value</i>...<i>xx</i> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1–255) ■ n392dce—DCE error threshold (1–10) ■ n392dte—DTE error threshold (1–10) ■ n393dce—DCE monitored event count (1–10) ■ n393dte—DTE monitored event count (1–10) ■ t391dte—DTE polling timer (5–30 seconds) ■ t392dce—DCE polling verification timer (5–30 seconds) | detail extensive none |
| LMI | <p>(Frame Relay) LMI packet statistics:</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: <i>nn</i> (last seen <i>hh:mm:ss</i> ago). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: <i>nn</i> (last seen <i>hh:mm:ss</i> ago). | detail extensive none |
| LCP state | <p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | <p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |

Table 113: Channelized DS3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication). ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone hh:mm:ss ago</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 113: Channelized DS3 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------|--|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Giants—Number of frames received that are larger than the giant threshold. ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Counter increments when the software could not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Count of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ SRAM errors—Number of hardware errors that occurred in the static RAM (SRAM) on the PIC. If the value in this field increments, the PIC is malfunctioning. ■ HS link CRC errors—Count of errors on the high-speed links between the ASICs responsible for handling the router interfaces. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly, (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. | extensive |

Table 113: Channelized DS3 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------|--|-----------------------|
| DS1 alarms | Media-specific defects that can render the interface unable to pass packets. When a defect persists for a certain amount of time, it is promoted to an alarm. | detail extensive none |
| DS1 defects | Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. <ul style="list-style-type: none"> ■ LOS—Loss of signal. ■ LOF—Loss of frame. ■ AIS—Alarm indication signal. ■ YLW—Yellow alarm. Indicates errors at the remote site receiver. | |
| T1 media | Counts of T1 media-specific errors. <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>The T1 media-specific error types can be:</p> <ul style="list-style-type: none"> ■ SEF—Severely errored framing ■ BEE—Bit error event ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ YELLOW—Errors at the remote site receiver ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—Pulse code violation ■ CS—Carrier state ■ LES—Line error seconds ■ ES—Errored seconds ■ SEFS—Severely errored framing seconds (section) ■ SES—Severely errored seconds ■ BES—Bit error seconds ■ UAS—Unavailable seconds | extensive |

Table 113: Channelized DS3 show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------|
| DS3 media | <p>Counts of T3 media-specific errors. For detailed definitions of the T3 (DS-3) error events (BPV, EXZ, LCV, PCV, and CCV) and performance parameters (LES, PES, PSES, CES, CSES, SEFS, and UAS), see RFC 2496.</p> <ul style="list-style-type: none"> ■ PLL Lock—Phase-locked loop out of lock ■ Reframing—Frame alignment recovery time ■ AIS—Alarm indication signal ■ LOF—Loss of frame ■ LOS—Loss of signal ■ IDLE—Idle code detected ■ YELLOW—Remote defect indication ■ BPV—Bipolar violation ■ EXZ—Excessive zeros ■ LCV—Line code violation ■ PCV—Pulse code violation ■ CCV—C-bit coding violation ■ LES—Line error seconds ■ PES—P-bit errored seconds ■ PSES—P-bit errored seconds (section) ■ CES—C-bit errored seconds ■ CSES—C-bit severely errored seconds ■ SEFS—Severely errored framing seconds ■ UAS—Unavailable seconds | extensive |
| HDLC configuration | <p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Timeslots—Configured time slots for the interface. ■ Byte encoding—Byte encoding used: Nx64K or Nx56K. ■ Data inversion—HDLC data inversion setting: Enabled or Disabled | extensive |
| Interface transmit queues | <p>Name of the transmit queues and their associated statistics for each DS1 channel on the Channelized DS3-to-DS1 PIC.</p> <ul style="list-style-type: none"> ■ B/W—Queue bandwidth as a percentage of the total interface bandwidth. ■ WRR—Weighted round-robin (in percent). ■ Packets—Number of packets transmitted. ■ Bytes—Number of bytes transmitted. ■ Drops—Number of packets dropped. ■ Errors—Number of packet errors. | extensive |

Table 113: Channelized DS3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| DS1 or DS3 BERT configuration | <p>BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface.</p> <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. ■ CoS transmit queue—The queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ bandwidth %—Percentage of bandwidth allocated to the queue. ■ Bandwidth bps—Bandwidth allocated to the queue (in bps). ■ buffer %—Percentage of buffer space allocated to the queue. ■ Buffer usec—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: low or high. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are none and exact. If exact is configured, the queue only transmits up to the configured bandwidth, even if excess bandwidth is available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Bandwidth | Bandwidth configured on the interface. | All levels |
| Protocol | Protocol family configured on the logical interface, such as iso, inet6, mpls. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 113: Channelized DS3 show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------|---|-----------------------|
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive none |
| Redundant Link | (LSQ redundancy) Backup link for Link Services IQ redundancy. | detail extensive none |

**show interfaces
extensive (Channelized
DS3-to-DS0)**

```

user@host> show interfaces ds-0/0/0:0:0 extensive
Physical interface: ds-0/0/0:0:0, Enabled, Physical link is Up
Interface index: 174, SNMP ifIndex: 4298, Generation: 177
Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 640kbps, FCS: 16,
Mode: C/Bit parity, Framing: ESF
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags     : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 280 (last seen 00:00:09 ago)
  Output: 286 (last sent 00:00:00 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
CHAP state: Not-configured
Last flapped   : 2002-05-23 17:53:29 PDT (00:46:46 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes   :                6814                16 bps
  Output bytes  :               28840                72 bps
  Input packets:                568                 0 pps
  Output packets:               893                 0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 39, Policed discards: 0,
  L3 incompletes: 0, L2 channel errors: 2, L2 mismatch timeouts: 0,
  HS link CRC errors: 0
Output errors:
  Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0
DS1  alarms   : None
DS3  alarms   : None
DS1  defects  : None
DS3  defects  : None
T1  media:           Seconds          Count   State

```

```

SEF                0                0 OK
BEE                5                1 OK
AIS                0                0 OK
LOF                0                0 OK
LOS                0                0 OK
YELLOW            17                1 OK
BPV                0                0
EXZ                0                0
LCV                5                27765
PCV                0                0
CS                 0                0
LES                0
ES                 0
SES                5
SEFS               10
BES                0
UAS                0
DS3 media:         Seconds          Count  State
PLL Lock           0                0 OK
Reframing          0                0 OK
AIS                0                0 OK
LOF                0                0 OK
LOS                0                0 OK
IDLE               0                0 OK
YELLOW            0                0 OK
BPV                1                65535
EXZ                1                65535
LCV                2                131070
PCV                1                1825
CCV                0                0
LES                1
PES                1
PSES               1
CES                0
CSES               0
SEFS               0
UAS                0
Interface transmit queues:
      B/W  WRR      Packets      Bytes      Drops      Errors
Queue0   95  95          0         0         0         0
Queue1    5   5        893       28840         0         0
HDLC configuration:
  Giant threshold: 1514, Runt threshold: 3
  Timeslots      : 1-10
  Byte encoding: Nx64K, Data inversion: Disabled
DS3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^15 - 1, Induced error rate: 10e-0
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 2 (0x01)
  CoS transmit queue      Bandwidth      Buffer Priority  Limit
                        %      bps      %      usec
0 best-effort            95      608000  95         0      low  none
3 network-control        5       32000   5         0      low  none
Logical interface ds-0/0/0:0:0.0 (Index 5) (SNMP ifIndex 4299)
(Generation 943)
  Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 1500, Generation: 949, Route table: 0

```

```
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 18.18.18.1, Local: 18.18.18.2, Broadcast: Unspecified,
  Generation: 1849
```

show interfaces (Channelized DS3-to-DS1)

| | |
|---|--|
| Syntax | <pre>show interfaces t1-fpc/pic/port:t1channel <brief detail extensive terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified channelized DS3-to-DS1 interface. |
| Options | <p>t1-fpc/pic/port:t1channel—Display standard information about the specified channelized DS3-to-DS1 interface.</p> <p>brief detail extensive terse—(Optional) Display brief interface information.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (channelized DS3-to-DS1) on page 579 |
| Output Fields | See Table 113 on page 568 for the output fields for the show interfaces (all Channelized DS3 interfaces) command. Output fields are listed in the approximate order in which they appear. |
| show interfaces extensive (channelized DS3-to-DS1) | <pre>user@host> show interfaces t1-0/0/0:0 extensive Physical interface: t1-0/0/0:0, Enabled, Physical link is Up Interface index: 210, SNMP ifIndex: 14, Generation: 2977 Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 640kbps, Loopback: None, FCS: 16, Mode: C/Bit parity, Framing: ESF Device flags : Present Running Interface flags: Point-To-Point SNMP-Traps Link flags : Keepalives Hold-times : Up 0 ms, Down 0 ms Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3 Keepalive statistics: Input : 30 (last seen 00:00:05 ago) Output: 29 (last sent 00:00:00 ago) LCP state: Opened NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls: Not-configured CHAP state: Not-configured Last flapped : 2002-05-23 17:30:12 PDT (17:29:43 ago) Statistics last cleared: Never</pre> |

```

Traffic statistics:
Input bytes :          944          16 bps
Output bytes :        1162          16 bps
Input packets:          66           0 pps
Output packets:         82           0 pps
Input errors:
  Errors: 1, Drops: 0, Framing errors: 1, Policed discards: 8,
  L3 incompletes: 0, L2 channel errors: 1, L2 mismatch timeouts: 0,
  HS link CRC errors: 0, SRAM errors: 0
Output errors:
  Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0
DS1  alarms : None
DS3  alarms : None
DS1  defects : None
DS3  defects : None
T1  media:
Seconds      Count  State
SEF          0        0 OK
BEE         11         5 OK
AIS         28         1 OK
LOF         27         1 OK
LOS          0         0 OK
YELLOW      23         1 OK
BPV          0         0
EXZ          0         0
LCV         11      20574
PCV          0         0
CS           0         0
LES         28
ES          28
SES         39
SEFS        50
BES         0
UAS         0
DS3  media:
Seconds      Count  State
PLL Lock     0         0 OK
Reframing    0         0 OK
AIS          0         0 OK
LOF          1         1 OK
LOS          1         1 OK
IDLE         0         0 OK
YELLOW      0         0 OK
BPV          2      131070
EXZ          3      49910
LCV          5      180980
PCV          2        327
CCV         12     264558
LES          3
PES          3
PSES         2
CES         13
CSES        13
SEFS         1
UAS         35
Interface transmit queues:
      B/W  WRR  Packets      Bytes      Drops      Errors
Queue0  95  95         0         0         0         0
Queue1   5   5         82        1162         0         0
HDLC configuration:
  Giant threshold: 1514, Runt threshold: 3
  Timeslots      : 1-10
  Line encoding: B8ZS, Byte encoding: Nx64K, Data inversion: Disabled

```



```

DS3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^15 - 1, Induced error rate: 10e-0
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 2 (0x00)
  CoS transmit queue      Bandwidth      Buffer Priority  Limit
                           %      bps      %      usec
  0 best-effort           95      608000  95      0      low  none
  3 network-control       5       32000   5       0      low  none
Logical interface t1-0/0/0:0.0 (Index 11) (SNMP ifIndex 23) (Generation 497)
Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
Bandwidth: 0
Protocol inet, MTU: 1500, Generation: 576, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 21.21.21.2, Local: 21.21.21.1, Broadcast: Unspecified,
  Generation: 977

```

show interfaces (Channelized T1 IQ)

Syntax `show interfaces (ct1-fpc/pic/port | type-fpc/pic/port<:channel><:channel>)
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index snmp-index>
<statistics>`

Release Information Command introduced in JUNOS Release 7.4.

Description (M-series and T-series routing platforms only) Display status information about the specified channelized T1 IQ interface.

Options *type-fpc/pic/port:channel*—Interface type. With optional corresponding channel levels, the interface type can be one of the following:

- *type-fpc/pic/port*—For the physical channelized T1 IQ interface, *type* is **ct1**.
- *type-fpc/pic/port:channel*—For the clear channel, *type* is **t1**. At the first level of channelization, *type* can be **ct1** or **t1**.
- *type-fpc/pic/port:channel:channel*—At the second level of channelization, *type* can be **ds**.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output `show interfaces extensive` (CT1) on page 590
`show interfaces extensive` (T1) on page 591
`show interfaces extensive` (DS0) on page 592

Output Fields Table 114 on page 582 lists the output fields for the `show interfaces` (Channelized T1 IQ and T3 IQ interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---------------------------------|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|--|-----------------------|
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source. It can be Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Loopback | Whether loopback is enabled and the type of loopback (local or remote). | All levels |
| FCS | Frame check sequence on the interface (either 16 or 32). The default is 16 bits. | All levels |
| Framing | Physical layer framing format used on the link. It can be ESF or SF . The default is ESF . | All levels |
| Parent | Name and interface index of the interface to which a particular child interface belongs. None indicates that this interface is the top level. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Keepalive settings | Configured settings for keepalives. <ul style="list-style-type: none"> ■ interval seconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. ■ down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. ■ up-count number—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. | detail extensive none |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|----------------------|--|-----------------------|
| Keepalive statistics | <p>Information about keepalive packets.</p> <ul style="list-style-type: none"> ■ Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>. ■ Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> ■ (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. | detail extensive none |
| LMI settings | <p>(Frame Relay) Settings for Local Management Interface (LMI) can be either ANSI LMI settings or ITU LMI settings. ANSI LMI settings is the default. The format is (ANSI or ITU) LMI settings: <i>value, value... xx seconds</i>, where <i>value</i> can be:</p> <ul style="list-style-type: none"> ■ n391dte—DTE full status polling interval (1–255) ■ n392dce—DCE error threshold (1–10) ■ n392dte—DTE error threshold (1–10) ■ n393dce—DCE monitored event count (1–10) ■ n393dte—DTE monitored event count (1–10) ■ t391dte—DTE polling timer (5–30 seconds) ■ t392dce—DCE polling verification timer (5–30 seconds) | detail extensive none |
| LMI | <p>(Frame Relay) LMI packet statistics:</p> <ul style="list-style-type: none"> ■ Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: <i>nn</i> (last seen <i>hh:mm:ss</i> ago). ■ Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: <i>nn</i> (last sent <i>hh:mm:ss</i> ago). | detail extensive none |
| DTE statistics | <p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data communication equipment (DCE):</p> <ul style="list-style-type: none"> ■ Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. ■ Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. ■ Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. ■ Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. | detail extensive none |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| DCE statistics | <p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> ■ Enquiries received—Number of enquiries received by the DCE from the DTE. ■ Full enquiries received—Number of full enquiries received by the DCE from the DTE. ■ Enquiry responses sent—Number of enquiry responses sent from the DCE to the DTE. ■ Full enquiry responses sent—Number of full enquiry responses sent from the DCE to the DTE. | detail extensive none |
| Common statistics | <p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> ■ Unknown messages received—Number of received packets that do not fall into any category. ■ Asynchronous updates received—Number of link status peer changes received. ■ Out-of-sequence packets received—Number of packets for which the sequence of the packets received is different from the expected sequence. ■ Keepalive responses timedout—Number of keepalive responses that timed out when no LMI packet was reported for n392dte or n393dce intervals. (See LMI settings.) | detail extensive none |
| Nonmatching DCE-end DLCIs | (Frame Relay) Number of DLCIs configured from the DCE, displayed only from the DTE. | detail extensive none |
| LCP state | <p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—LCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—LCP is not configured on the interface. ■ Opened—LCP negotiation is successful. | detail extensive none |
| NCP state | <p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| CHAP state | <p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> ■ Chap-Chal-received—Challenge was received but response not yet sent. ■ Chap-Chal-sent—Challenge was sent. ■ Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) ■ Chap-Resp-sent—Response was sent for the challenge received. ■ Closed—CHAP authentication is incomplete. ■ Failure—CHAP authentication failed. ■ Not-configured—CHAP is not configured on the interface. ■ Success—CHAP authentication was successful. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| CoS queues | Number of CoS queues configured. | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---------------|---|-----------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Giants—Number of frames received that are larger than the giant threshold. ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Counter increments when the software could not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Count of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. ■ HS link CRC errors—Count of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ SRAM errors—Number of hardware errors that occurred in the static RAM (SRAM) on the PIC. If the value in this field increments, the PIC is malfunctioning. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ MTU errors—Number of packets whose size exceeds the MTU of the interface. ■ Resource errors—Sum of transmit drops. | extensive |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------------|---|-----------------------|
| Queue counters | CoS queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| DS1 alarms DS1 defects | Media-specific defects that can render the interface unable to pass packets. When a defect persists for a certain amount of time, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. <ul style="list-style-type: none"> ■ LOS—Loss of signal. ■ LOF—Loss of frame. ■ AIS—Alarm indication signal. ■ YLW—Yellow alarm. Indicates errors at the remote site receiver. | detail extensive none |
| T1 media | Counts of T1 media-specific errors. <ul style="list-style-type: none"> ■ Seconds—Number of seconds the defect has been active. ■ Count—Number of times that the defect has gone from inactive to active. ■ State—State of the error. State other than OK indicates a problem. <p>The T1 media-specific error types can be:</p> <ul style="list-style-type: none"> ■ AIS—Alarm indication signal ■ BEE—Bit error event ■ BES—Bit error seconds ■ BPV—Bipolar violation ■ CS—Carrier state ■ ES—Errored seconds ■ EXZ—Excessive zeros ■ FEBE—Far-end block error ■ LCV—Line code violation ■ LES—Line error seconds ■ LOF—Loss of frame ■ LOS—Loss of signal ■ PCV—Pulse code violation ■ SEF—Severely errored framing ■ SEFS—Severely errored framing seconds (section) ■ SES—Severely errored seconds ■ UAS—Unavailable seconds ■ YELLOW—Errors at the remote site receiver | extensive |
| Line encoding | Line encoding used: B8ZS or AMI. | All levels |
| Buildout | Buildout setting. | All levels |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| HDLC configuration | Information about the HDLC configuration. <ul style="list-style-type: none"> ■ Policing bucket—Configured state of the receiving policer. ■ Shaping bucket—Configured state of the transmitting shaper. ■ Giant threshold—Giant threshold programmed into the hardware. ■ Runt threshold—Runt threshold programmed into the hardware. ■ Timeslots—Configured time slots for the interface. ■ Line encoding—Line encoding used: B8ZS or AMI. ■ Byte encoding—Byte encoding used: Nx64K or Nx56K. ■ Data inversion—HDLC data inversion setting: Enabled or Disabled. ■ Idle cycle Flag—Idle cycle flags. ■ Start end Flag—Start and end flag. | extensive |
| DS0 or DS1 BERT configuration | BERT (bit error rate test) checks the quality of the line. This output appears only when a BERT is run on the interface. <ul style="list-style-type: none"> ■ BERT time period—Configured total time period that the BERT is to run. ■ Elapsed—Actual time elapsed since the start of the BERT (in seconds). ■ Induced error rate—Configured rate at which the bit errors are induced in the BERT pattern. ■ Algorithm—Type of algorithm selected for the BERT. | detail extensive none |
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ PLP byte—Packet Level Protocol byte. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Protocol | Protocol family configured on the logical interface, such as iso, inet6, or mpls. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |

Table 114: Channelized T1 IQ and T3 IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| DLCI | (Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: Flags , Total down time , Last down , and Traffic statistics . Flags is one or more of the following: <ul style="list-style-type: none"> ■ Active—Set when the link is active and the DTE and DCE are exchanging information. ■ Down—Set when the link is active, but no information is received from the DCE. ■ Unconfigured—Set when the corresponding DLCI in the DCE is not configured. ■ Configured—Set when the corresponding DLCI in the DCE is configured. ■ Dce-configured—Displayed when the command is issued from the DTE. | detail extensive none |
| DLCI statistics | (Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> ■ Active DLCI—Number of active DLCIs. ■ Inactive DLCI—Number of inactive DLCIs. | detail extensive none |

```

show interfaces user@host> show interfaces extensive ct1-0/1/1
extensive (CT1) Physical interface: ct1-0/1/1, Enabled, Physical link is Up
Interface index: 145, SNMP ifIndex: 32, Generation: 28
Link-level type: Controller, Clocking: Internal, Speed: T1,
Loopback: None, Framing: ESF, Parent: None
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps 16384
Link flags     : None
Hold-times    : Up 0 ms, Down 0 ms
CoS queues    : 4 supported
Last flapped  : 2005-08-17 11:47:09 PDT (1d 03:38 ago)
Statistics last cleared: 2005-08-18 15:25:37 PDT (00:00:27 ago)
DS1 alarms    : None
DS1 defects   : None
T1 media:
SEF           0          0 OK
BEE           0          0 OK
AIS           0          0 OK
LOF           0          0 OK
LOS           0          0 OK

```

```

YELLOW                0          0 OK
BPV                   0          0
EXZ                   0          0
LCV                   0          0
PCV                   0          0
CS                    0          0
LES                   0
ES                    0
SES                   0
SEFS                  0
BES                   0
UAS                   0
Line encoding: B8ZS
Buildout              : 0 to 132 feet
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0 (0x00)

```

```

show interfaces user@host> show interfaces extensive t1-0/2/0
extensive (T1) Physical interface: t1-0/2/0, Enabled, Physical link is Up
  Interface index: 161, SNMP ifIndex: 33, Generation: 61
  Link-level type: PPP, MTU: 1504, Speed: T1, Loopback: None, FCS: 16,
  Parent: ct1-0/2/0 Interface index 148
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago)
DTE statistics:
  Enquiries sent           : 43186
  Full enquiries sent      : 8515
  Enquiry responses received : 43185
  Full enquiry responses received : 8515
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 0
Nonmatching DCE-end DLCIs:
  2
Hold-times      : Up 0 ms, Down 0 ms
CoS queues      : 4 supported
Last flapped    : 2005-09-07 15:43:47 PDT (00:00:06 ago)
Statistics last cleared: Never
Traffic statistics:
  Input  bytes :           0          0 bps
  Output bytes :          14          0 bps
  Input  packets:           0          0 pps
  Output packets:           1          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, L3 incompletes: 0,
  L2 channel errors: 0, L2 mismatch timeouts: 0,
  HS link CRC errors: 0, SRAM errors: 0, Resource errors: 0

```

```

Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0,
  MTU errors: 0, Resource errors: 0
Queue counters:      Queued packets  Transmitted packets  Dropped packets
  0 best-effort      0                      0                    0
  1 expedited-fo     0                      0                    0
  2 assured-forw     0                      0                    0
  3 network-cont     1                      1                    0
DS1  alarms   : None
DS1  defects  : None
HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 1514, Runt threshold: 2
  Timeslots      : All active
  Byte encoding: Nx64K, Data inversion: Disabled, Idle cycle flag:
  flags, Start end flag: shared
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 4 (0x00)

```

```

show interfaces user@host> show interfaces extensive ds-0/1/0:0
extensive (DS0) Physical interface: ds-0/1/0:1, Enabled, Physical link is Up
  Interface index: 157, SNMP ifIndex: 52, Generation: 46
  Link-level type: Frame-Relay, PPP, MTU: 1504, Clocking: Internal,
  Speed: 640kbps, Loopback: None, FCS:16,
  Parent: ct1-0/1/0 Interface index 143
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives DTE
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI: Input: 51700 (00:00:02 ago), Output: 51701 (00:00:02 ago)
  DTE statistics:
    Enquiries sent           : 43186
    Full enquiries sent      : 8515
    Enquiry responses received : 43185
    Full enquiry responses received : 8515
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received  : 0
    Enquiry responses sent   : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 0
  Nonmatching DCE-end DLCIs:
    2
  Hold-times      : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 8 (last seen 00:00:12 ago)
    Output: 8 (last sent 00:00:07 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Not-configured
  CoS queues   : 4 supported
  Last flapped : 2005-08-18 15:23:46 PDT (00:03:17 ago)
  Statistics last cleared: 2005-08-18 15:25:37 PDT (00:01:26 ago)
  Traffic statistics:

```

```

Input bytes :                840                0 bps
Output bytes :                912                0 bps
Input packets:                25                0 pps
Output packets:              26                0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, L3 incompletes: 0,
  L2 channel errors: 0, L2 mismatch timeouts: 0, HS link CRC errors: 0,
  Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0,
  MTU errors: 0, Resource errors: 0
Queue counters:      Queued packets  Transmitted packets  Dropped packets
0 best-effort        0                0                0
1 expedited-fo       0                0                0
2 assured-forw       0                0                0
3 network-cont       26                26                0
HDLC configuration:
  Giant threshold: 1514, Runt threshold: 2
  Timeslots       : 1-10
  Byte encoding: Nx64K, Data inversion: Disabled, Idle cycle flag: flags,
  Start end flag: shared
DS0 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 4 (0x00)
Logical interface ds-0/1/0:1.0 (Index 67) (SNMP ifIndex 53) (Generation 11)
  Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 1500, Generation: 26, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 11.11.11.0/30, Local: 11.11.11.2, Broadcast: 11.11.11.3,
    Generation: 39
DLCI 100
  Flags: Active, Dce-configured
  Total down time: 0 sec, Last down: Never
Traffic statistics:
  Input bytes :                0
  Output bytes :                0
  Input packets:                0
  Output packets:              0
DLCI statistics:
  Active DLCI :2 Inactive DLCI : 0
...
```

show interfaces (Channelized T3 IQ)

Syntax `show interfaces (ct3-fpc/pic/port | type-fpc/pic/port<:channel><:channel>)
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index snmp-index>
<statistics>`

Release Information Command introduced before JUNOS Release 7.4.

Description (M-series and T-series routing platforms only) Display status information about the specified channelized T3 IQ interface.

Options *type-fpc/pic/port:channel*—Interface type. With optional corresponding channel levels, the interface type can be one of the following:

- *type-fpc/pic/port*—For the physical channelized T3 IQ interface, *type* is *ct3*.
- *type-fpc/pic/port:channel*—For the clear channel, *type* is *t3*. At the first level of channelization, *type* can be *ct1* or *t1*.
- *type-fpc/pic/port:channel:channel*—At the second level of channelization, *type* is *ds*.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output `show interfaces extensive` (Channelized T3 IQ) (Physical) on page 595
`show interfaces extensive` (Channelized T1 on Channelized T3 IQ) on page 595
`show interfaces extensive` (DS0 on Channelized T3 IQ) on page 595

Output Fields Table 114 on page 582 lists the output fields for the `show interfaces` (Channelized T1 IQ and T3 IQ) command. Output fields are listed in the approximate order in which they appear.

```

show interfaces      user@host> show interfaces extensive ct3-0/0/1
extensive (Channelized Physical interface: ct3-0/0/1, Enabled, Physical link is Up
T3 IQ) (Physical)   Interface index: 30, SNMP ifIndex: 317, Generation: 29
                        Link-level type: Controller, MTU: 4474, Clocking: Internal, Speed: T3,
                        Loopback: None, FCS: 16, Mode: C/Bit parity, Parent: None
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps
                        Link flags     : None
                        ...

show interfaces      user@host> show interfaces extensive ct1-0/0/1:2
extensive           Physical interface: ct1-0/0/1:2, Enabled, Physical link is Up
(Channelized T1 on   Interface index: 175, SNMP ifIndex: 1505, Generation: 174
Channelized T3 IQ) Link-level type: Controller, MTU: 1504, Clocking: Internal, Speed: T1,
                        Loopback: None, FCS: 16, Framing: ESF, Parent: ct3-0/0/1 (Index 32)
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps
                        Link flags     : None
                        ...

show interfaces      user@host> show interfaces extensive ds-0/0/1:2:1
extensive (DS0 on   Physical interface: ds-0/0/1:2:1, Enabled, Physical link is Up
Channelized T3 IQ) Interface index: 176, SNMP ifIndex: 1563, Generation: 175
                        Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 640kbps,
                        Loopback: None, FCS: 16, Parent: ct1-0/0/1:2(Index 175)
                        Device flags   : Present Running
                        Interface flags: Point-To-Point SNMP-Traps
                        Link flags     : Keepalives
                        ...

```

show interfaces controller (Channelized T1 IQ)

| | |
|---------------------------------|--|
| Syntax | show interfaces controller <i>ct1-fpc/pic/slot</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display the interface names of the specified physical channelized T1 IQ interface and the channels configured on it. |
| Options | <i>ct1-fpc/pic/slot</i> —Channelized T1 IQ interface name. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces controller (T1 IQ) (Clear-Channel T1) on page 596 show interfaces controller (T1 IQ) (Channelized DS) on page 596 |
| Output Fields | Table 115 on page 596 lists the output fields for the show interfaces controller (Channelized T1 IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 115: Channelized T1 IQ show interfaces controller Output Fields

| Field Name | Field Description |
|------------|---|
| Controller | Physical channelized interface name and the names of any channels configured on it. |
| Admin | Administrative status of the interface. |
| Link | Link status of the interface. |

show interfaces controller (T1 IQ) (Clear-Channel T1)

The following sample output displays the channelized T1 IQ interface when it is configured as a clear-channel T1 interface:

```
user@host> show interfaces controller ct1-0/2/0
```

| | | |
|------------|-------|------|
| Controller | Admin | Link |
| ct1-0/2/0 | up | up |
| t1-0/2/0 | up | up |

show interfaces controller (T1 IQ) (Channelized DS)

The following sample output displays the channelized T1 IQ interfaces when it is configured down to the channelized DS level:

```
user@host> show interfaces controller ct1-0/2/1
```

| | | |
|------------|-------|------|
| Controller | Admin | Link |
| ct1-0/2/1 | up | up |
| ds-0/2/1:1 | up | up |
| ds-0/2/1:2 | up | up |

show interfaces controller (Channelized T3 IQ)

| | |
|--------------------------|---|
| Syntax | show interfaces controller <i>ct3-fpc/pic/slot</i> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display the interface names of the specified physical channelized T3 IQ interface and the channels configured on it. |
| Options | <i>ct3-fpc/pic /slot</i> —Channelized T3 IQ interface name. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces controller (T3 IQ) on page 597 |
| Output Fields | Table 116 on page 597 lists the output fields for the show interfaces controller (Channelized T3 IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 116: Channelized T3 IQ show interfaces controller Output Fields

| Field Name | Field Description |
|------------|---|
| Controller | Physical channelized interface name and the names of any channels configured on it. |
| Admin | Administrative status of the interface. |
| Link | Link status of the interface. |

| | | | |
|------------------------------------|---|-------|------|
| show interfaces controller (T3 IQ) | user@host> show interfaces controller ct3-0/0/1 | | |
| | Controller | Admin | Link |
| | ct3-0/0/1 | up | up |
| | t1-0/0/1:1 | up | up |
| | ct1-0/0/1:2 | up | up |
| | ds-0/0/1:2:1 | up | up |
| | ds-0/0/1:2:2 | up | up |
| | ds-0/0/1:2:3 | up | up |
| | t1-0/0/1:3 | | |
| | ... | up | down |
| | t1-0/0/1:10 | up | up |
| | ct1-0/0/1:11 | up | up |
| | ... | | |
| | ct1-0/0/1:28 | up | up |

Part 11

Services Interfaces

- Adaptive Services Interface Operational Mode Commands on page 601
- Encryption Interface Operational Mode Commands on page 613
- Flow Collector and Monitoring Interface Operational Mode Commands on page 621
- Link Services Interface Operational Mode Commands on page 637
- Tunnel Services Interface Operational Mode Commands on page 677
- VoIP Interface Operational Mode Commands on page 705

Chapter 19

Adaptive Services Interface Operational Mode Commands

Table 117 on page 601 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot adaptive services interfaces and redundant adaptive services interfaces.

Table 117: Adaptive Services Interfaces Operational Mode Commands

| Task | Command |
|---|---|
| Switch between primary and secondary adaptive services interfaces. | request interface (revert switchover) (Adaptive Services) |
| Display status information about individual adaptive services interfaces. | show interfaces (Adaptive Services) |
| Display detailed status information about redundant adaptive services configurations. | show interfaces (Redundant Adaptive Services) |
| Display general status information about redundant adaptive services configurations. | show interfaces redundancy |

request interface (revert | switchover) (Adaptive Services)

Syntax request interface (revert | switchover) (*rspnumber* | *rlsqnumber*)

Release Information Command introduced before JUNOS Release 7.4.
Support for *rlsq* interfaces added in JUNOS Release 7.6.

Description (M-series and T-series platforms only) Manually revert to the primary adaptive services interface or link services IQ interface, or to switch from the primary to the secondary interface.

On an aggregated Ethernet interface with link protection enabled, use the **request interface (revert | switchover)** (Aggregated Ethernet Link Protection) operational command to manually revert egress traffic from the designated backup link to the designated primary link, or to manually switch egress traffic from the primary link to the backup link. For information about this command, see **request interface (revert | switchover)** (Aggregated Ethernet Link Protection).

Options (revert | switchover)—The **revert** keyword restores active processing to the primary adaptive services (sp) or link services IQ (lsq) interface. The **switchover** keyword transfers active processing to the secondary (backup) interface.

rspnumber—Redundant adaptive services interface name.

rlsqnumber—Redundant link services IQ interface name.

Required Privilege Level view

List of Sample Output request interface revert on page 602

Output Fields When you enter this command, you are provided feedback on the status of your request.

request interface revert user@host> **request interface revert rsp1**

show interfaces (Adaptive Services)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified adaptive services interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the interface type is <i>sp-fpc/pic/port</i>. On the J-series routing platform, the interface type is <i>sp-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Adaptive Services) on page 607</p> <p>show interfaces brief (Adaptive Services) on page 607</p> <p>show interfaces detail (Adaptive Services) on page 607</p> <p>show interfaces extensive (Adaptive Services) on page 608</p> |
| Output Fields | Table 118 on page 603 lists the output fields for the show interfaces (adaptive services and redundant adaptive services) command. Output fields are listed in the approximate order in which they appear. |

Table 118: Adaptive Services and Redundant Adaptive Services show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 118: Adaptive Services and Redundant Adaptive Services show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Encapsulation being used on the interface. | All levels |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source: can be Internal or External . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Physical interface link type: Full-Duplex or Half-Duplex . | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive none |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | MAC address of the hardware. | detail extensive none |
| Alternate link address | Backup address of the link. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 118: Adaptive Services and Redundant Adaptive Services show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |

Table 118: Adaptive Services and Redundant Adaptive Services show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------------------|---|-----------------------|
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the logical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes generally less than 1 second for the counter to stabilize. | detail extensive |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <i>inet</i> , the IP address of the interface is also displayed. | brief |
| Protocol | Protocol family configured on the logical interface, such as <i>iso</i> , <i>inet6</i> , <i>mpls</i> . | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, <i>0</i> refers to the routing table <i>inet.0</i> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces sp-1/2/0
(Adaptive Services)
Physical interface: sp-1/2/0, Enabled, Physical link is Up
  Interface index: 147, SNMP ifIndex: 72
  Type: Adaptive-Services, Link-level type: Adaptive-Services, MTU: 9192,
  Speed: 800mbps
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link type      : Full-Duplex
  Link flags     : None
  Last flapped   : 2006-03-06 11:37:18 PST (00:57:29 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)

Logical interface sp-1/2/0.16383 (Index 68) (SNMP ifIndex 73)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Adaptive-Services
  Input packets : 3057
  Output packets: 3044
  Protocol inet, MTU: 9192
    Flags: Receive-options, Receive-TTL-Exceeded
    Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.0.0.34, Local: 10.0.0.1

show interfaces brief user@host> show interfaces sp-1/2/0 brief
(Adaptive Services)
Physical interface: sp-1/2/0, Enabled, Physical link is Up
  Type: Adaptive-Services, Link-level type: Adaptive-Services, MTU: 9192,
  Clocking: Unspecified, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000

Logical interface sp-1/2/0.16383
  Flags: Point-To-Point SNMP-Traps Encapsulation: Adaptive-Services
  inet 10.0.0.1      --> 10.0.0.34

show interfaces detail user@host> show interfaces sp-1/2/0 detail
(Adaptive Services)
Physical interface: sp-1/2/0, Enabled, Physical link is Up
  Interface index: 147, SNMP ifIndex: 72, Generation: 30
  Type: Adaptive-Services, Link-level type: Adaptive-Services, MTU: 9192,
  Clocking: Unspecified, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link type      : Full-Duplex
  Link flags     : None
  Physical info  : Unspecified
  Hold-times    : Up 0 ms, Down 0 ms
  Current address: Unspecified, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped   : 2006-03-06 11:37:18 PST (00:57:56 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :          125147          0 bps
    Output bytes  :          1483113         0 bps
    Input packets :           3061          0 pps
    Output packets:           3048          0 pps

Logical interface sp-1/2/0.16383 (Index 68) (SNMP ifIndex 73) (Generation 7)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Adaptive-Services
  Traffic statistics:
    Input bytes   :          125147          0 bps
    Output bytes  :          1483113         0 bps
    Input packets :           3061          0 pps
    Output packets:           3048          0 pps

```

```

Local statistics:
  Input bytes :          125147
  Output bytes :         1483113
  Input packets:           3061
  Output packets:          3048
Transit statistics:
  Input bytes :           0          0 bps
  Output bytes :           0          0 bps
  Input packets:           0          0 pps
  Output packets:          0          0 pps
Protocol inet, MTU: 9192, Generation: 20, Route table: 1
Flags: Receive-options, Receive-TTL-Exceeded
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.0.34, Local: 10.0.0.1, Broadcast: Unspecified,
  Generation: 22

```

**show interfaces
extensive
(Adaptive Services)**

```

user@host> show interfaces sp-1/2/0 extensive
Physical interface: sp-1/2/0, Enabled, Physical link is Up
  Interface index: 147, SNMP ifIndex: 72, Generation: 30
  Type: Adaptive-Services, Link-level type: Adaptive-Services, MTU: 9192,
  Clocking: Unspecified, Speed: 800mbps
  Device flags : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link type : Full-Duplex
  Link flags : None
  Physical info : Unspecified
  Hold-times : Up 0 ms, Down 0 ms
  Current address: Unspecified, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped : 2006-03-06 11:37:18 PST (00:58:40 ago)
  Statistics last cleared: Never
Traffic statistics:
  Input bytes :          125547          0 bps
  Output bytes :         1483353          0 bps
  Input packets:           3065          0 pps
  Output packets:          3052          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 2, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0

Logical interface sp-1/2/0.16383 (Index 68) (SNMP ifIndex 73) (Generation 7)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Adaptive-Services
Traffic statistics:
  Input bytes :          125547
  Output bytes :         1483353
  Input packets:           3065
  Output packets:          3052
Local statistics:
  Input bytes :          125547
  Output bytes :         1483353
  Input packets:           3065
  Output packets:          3052
Transit statistics:
  Input bytes :           0          0 bps
  Output bytes :           0          0 bps
  Input packets:           0          0 pps
  Output packets:          0          0 pps
Protocol inet, MTU: 9192, Generation: 20, Route table: 1

```

Flags: Receive-options, Receive-TTL-Exceeded
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.0.0.34, Local: 10.0.0.1, Broadcast: Unspecified,
Generation: 22

show interfaces (Redundant Adaptive Services)

| | |
|--|--|
| Syntax | <pre>show interfaces <i>rspnumber</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified redundant adaptive services configuration. |
| Options | <p><i>rspnumber</i>—Display standard status information about the specified redundant adaptive services configuration.</p> <p><i>brief detail extensive terse</i>—(Optional) Display the specified level of output.</p> <p><i>descriptions</i>—(Optional) Display interface description strings.</p> <p><i>media</i>—(Optional) Display media-specific information about network interfaces.</p> <p><i>snmp-index snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><i>statistics</i>—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Redundant Adaptive Services) on page 610 |
| Output Fields | Table 118 on page 603 lists the output fields for the show interfaces (redundant adaptive services) command. Output fields are listed in the approximate order in which they appear. |
| show interfaces extensive (Redundant Adaptive Services) | <pre>user@host> show interfaces rsp0 extensive Physical interface: rsp0, Enabled, Physical link is Up Interface index: 150, SNMP ifIndex: 40, Generation: 44 Type: Adaptive-Services, Link-level type: Adaptive-Services, MTU: 9192, Clocking: Unspecified, Speed: 800mbps Device flags : Present Running Interface flags: Point-To-Point SNMP-Traps Redundancy-Device 16384 Link type : Full-Duplex Link flags : None Physical info : Unspecified Hold-times : Up 0 ms, Down 0 ms Current address: Unspecified, Hardware address: Unspecified Alternate link address: Unspecified Last flapped : 2005-03-11 18:36:37 UTC (00:00:08 ago) Statistics last cleared: Never Traffic statistics: Input bytes : 0 0 bps Output bytes : 0 0 bps Input packets: 0 0 pps</pre> |

```

Output packets:                0                0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0

Logical interface rsp0.0 (Index 68) (SNMP ifIndex 42) (Generation 30)
Flags: Point-To-Point SNMP-Traps Encapsulation: Adaptive-Services
Traffic statistics:
  Input bytes :                0
  Output bytes :               0
  Input packets:               0
  Output packets:              0
Local statistics:
  Input bytes :                0
  Output bytes :               0
  Input packets:               0
  Output packets:              0
Transit statistics:
  Input bytes :                0                0 bps
  Output bytes :               0                0 bps
  Input packets:               0                0 pps
  Output packets:              0                0 pps
Protocol inet, MTU: 9192, Generation: 37, Route table: 0
Flags: Receive-options, Receive-TTL-Exceeded

```

show interfaces redundancy

| | |
|---------------------------------|--|
| Syntax | show interfaces redundancy |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series, T-series, and MX-series routing platforms only) Display general information about adaptive services and link services intelligent queuing (IQ) interfaces redundancy. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show interfaces redundancy on page 612 |
| Output Fields | Table 119 on page 612 lists the output fields for the <code>show interfaces redundancy</code> command. Output fields are listed in the approximate order in which they appear. |

Table 119: show interfaces redundancy Output Fields

| Field Name | Field Description |
|----------------|---|
| Interface | Name of the redundant adaptive services or link services IQ interface. |
| State | State of the redundant interface: Not present , On primary , or On secondary . |
| Last Change | Timestamp for the last change in status. |
| Primary | Name of the interface configured to be the primary interface. |
| Secondary | Name of the interface configured to be the backup interface. |
| Current Status | Physical status of the primary and secondary interfaces. |

```

show interfaces user@host> show interfaces redundancy
redundancy
Interface  State      Last change Primary  Secondary Current status
rsp0       Not present                sp-1/0/0 sp-0/2/0 both down
rsp1       On secondary 1d 23:56  sp-1/2/0 sp-0/3/0 primary down
rsp2       On primary   10:10:27 sp-1/3/0 sp-0/2/0 secondary down
rlsq0      On primary   00:06:24 1sq-0/3/0 1sq-1/0/0 both up

```


Chapter 20

Encryption Interface Operational Mode Commands

Table 120 on page 613 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot encryption interfaces.

Table 120: Encryption Interface Operational Mode Commands

| Task | Command |
|---|------------------------------|
| Display status information about encryption interfaces. | show interfaces (Encryption) |

show interfaces (Encryption)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>es-fpc/pic/port:channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified encryption interface. |
| Options | <p><i>es-fpc/pic/port:channel</i>—Display standard status information about the specified encryption interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Encryption) on page 617</p> <p>show interfaces brief (Encryption) on page 617</p> <p>show interfaces detail (Encryption) on page 617</p> <p>show interfaces extensive (Encryption) on page 618</p> |
| Output Fields | Table 121 on page 614 lists the output fields for the show interfaces (ES) command. Output fields are listed in the approximate order in which they appear. |

Table 121: Encryption show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 121: Encryption show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Encapsulation being used on the interface. | All levels |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Link Flags” on page 91. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. ■ Anti-replay failures—Total number of antireplay failures seen on all tunnels configured on the ES PIC. ■ Authentication—Total number of authentication failures seen on all tunnels configured on the ES PIC. | detail extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |

Table 121: Encryption show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------------|---|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| IP-Header | IP header of the logical interface. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <i>inet</i> , the IP address of the interface is also displayed. | brief |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as <i>iso</i> , <i>inet6</i> , <i>mpls</i> . | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table <i>inet.0</i> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the logical interface. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces es-0/3/0
(Encryption)      Physical interface: es-0/3/0, Enabled, Physical link is Up
                    Interface index: 138, SNMP ifIndex: 71
                    Type: IPSEC, Link-level type: IPSEC-over-IP, MTU: 3900, Speed: 800mbps
                    Device flags   : Present Running
                    Interface flags: Point-To-Point SNMP-Traps
                    Input rate      : 0 bps (0 pps)
                    Output rate     : 0 bps (0 pps)

                    Logical interface es-0/3/0.0 (Index 70) (SNMP ifIndex 45)
                    Flags: Hardware-Down Point-To-Point SNMP-Traps
                    IP-Header 10.0.10.2:10.0.10.1::df:64:00000000 Encapsulation: IPSEC
                    Input packets : 0
                    Output packets: 0
                    Protocol inet, MTU: 3800
                    Flags: None
                    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
                    Destination: 10.10.0.2, Local: 10.10.0.1

show interfaces brief user@host> show interfaces es-0/3/0 brief
(Encryption)      Physical interface: es-0/3/0, Enabled, Physical link is Up
                    Type: IPSEC, Link-level type: IPSEC-over-IP, MTU: 3900, Speed: 800mbps
                    Device flags   : Present Running
                    Interface flags: Point-To-Point SNMP-Traps

                    Logical interface es-0/3/0.0
                    Flags: Hardware-Down Point-To-Point SNMP-Traps
                    IP-Header 10.0.10.2:10.0.10.1::df:64:00000000 Encapsulation: IPSEC
                    inet 10.10.0.1 --> 10.10.0.2s

show interfaces detail user@host> show interfaces es-0/3/0 detail
(Encryption)      Physical interface: es-0/3/0, Enabled, Physical link is Up
                    Interface index: 138, SNMP ifIndex: 71, Generation: 21
                    Type: IPSEC, Link-level type: IPSEC-over-IP, MTU: 3900, Speed: 800mbps
                    Hold-times      : Up 0 ms, Down 0 ms
                    Device flags    : Present Running
                    Interface flags: Point-To-Point SNMP-Traps
                    Statistics last cleared: Never
                    Traffic statistics:
                    Input bytes      : 0 0 bps
                    Output bytes     : 0 0 bps
                    Input packets    : 0 0 pps
                    Output packets   : 0 0 pps
                    Anti-replay failures : 0
                    Authentication failures : 0
                    Egress queues: 4 supported, 4 in use
                    Queue counters:
                    Queued packets  Transmitted packets  Dropped packets

                    0 best-effort 0 0 0
                    1 expedited-fo 0 0 0
                    2 assured-forw 0 0 0
                    3 network-cont 0 0 0

                    Logical interface es-0/3/0.0 (Index 70) (SNMP ifIndex 45) (Generation 9)
                    Flags: Hardware-Down Point-To-Point SNMP-Traps
                    IP-Header 10.0.10.2:10.0.10.1::df:64:00000000 Encapsulation: IPSEC
                    Traffic statistics:

```

```

Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Transit statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Protocol inet, MTU: 3800, Generation: 22, Route table: 0
Flags: None
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 10.10.0.2, Local: 10.10.0.1, Broadcast: Unspecified,
Generation: 26

```

**show interfaces
extensive (Encryption)**

```

user@host> show interfaces es-0/3/0 extensive
Physical interface: es-0/3/0, Enabled, Physical link is Up
Interface index: 138, SNMP ifIndex: 71, Generation: 21
Type: IPSEC, Link-level type: IPSEC-over-IP, MTU: 3900, Speed: 800mbps
Hold-times : Up 0 ms, Down 0 ms
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Anti-replay failures : 0
Authentication failures : 0
Egress queues: 4 supported, 4 in use
Queue counters: Queued packets Transmitted packets Dropped packets

0 best-effort 0 0 0
1 expedited-fo 0 0 0
2 assured-forw 0 0 0
3 network-cont 0 0 0

Logical interface es-0/3/0.0 (Index 70) (SNMP ifIndex 45) (Generation 9)
Flags: Hardware-Down Point-To-Point SNMP-Traps
IP-Header 10.0.10.2:10.0.10.1::df:64:00000000 Encapsulation: IPSEC
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Transit statistics:

```

```
Input bytes :          0          0 bps
Output bytes :          0          0 bps
Input packets:          0          0 pps
Output packets:         0          0 pps
Protocol inet, MTU: 3800, Generation: 22, Route table: 0
Flags: None
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 10.10.0.2, Local: 10.10.0.1, Broadcast: Unspecified,
Generation: 26
```


Chapter 21

Flow Collector and Monitoring Interface Operational Mode Commands

Table 122 on page 621 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot flow collector and flow monitoring interfaces. Commands are listed in alphabetical order.

Table 122: Flow Collector and Monitoring Interface Operational Mode Commands

| Task | Command |
|---|--|
| Display status information about dynamic flow capture interfaces. | show interfaces (Dynamic Flow Capture) |
| Display status information about flow collector interfaces. | show interfaces (Flow Collector) |
| Display status information about flow monitoring interfaces. | show interfaces (Flow Monitoring) |

show interfaces (Dynamic Flow Capture)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>dfc-fpc/pic/port:channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced in JUNOS Release 7.4. |
| Description | (M320 and M120 routers and T-series routing platforms only) Display status information about the specified dynamic flow capture interface. |
| Options | <p><i>dfc-fpc/pic/port:channel</i>—Display standard status information about the specified dynamic flow capture interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces (Dynamic Flow Capture) on page 625 |
| Output Fields | Table 123 on page 622 lists the output fields for the show interfaces (Dynamic Flow Capture) command. Output fields are listed in the approximate order in which they appear. |

Table 123: Dynamic Flow Capture show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation type used on the physical interface. | All levels |

Table 123: Dynamic Flow Capture show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------|--|------------------|
| MTU | Maximum Transmit Unit (MTU). Size of the largest packet to be transmitted. | All levels |
| Speed | Network speed on the interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input rate, Output rate—Number of bits per second (packets per second) received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because the frames did not recognize them or were not of interest. Usually, this field reports protocols that the JUNOS software does not support. ■ Resource errors—Sum of transmit drops. | extensive |

Table 123: Dynamic Flow Capture show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |
| Protocol | Protocol family configured on the logical interface (such as <code>iso</code> or <code>inet6</code>). | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Addresses associated with the logical interface and information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |

```

show interfaces      user@host> show interfaces dfc-0/0/0
(Dynamic Flow Capture)
Physical interface: dfc-0/0/0, Enabled, Physical link is Up
  Interface index: 146, SNMP ifIndex: 36
  Type: Adaptive-Services, Link-level type: Dynamic-Flow-Capture, MTU: 9192, Speed:
  2488320kbps
  Device flags : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link type : Full-Duplex
  Link flags : None
  Last flapped : 2005-08-26 15:08:36 PDT (01:18:42 ago)
  Input rate : 0 bps (0 pps)
  Output rate : 44800440 bps (100000 pps)

Logical interface dfc-0/0/0.0 (Index 67) (SNMP ifIndex 43)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Dynamic-Flow-Capture
  Input packets : 74
  Output packets: 132
  Protocol inet, MTU: 9192
  Flags: Receive-options, Receive-TTL-Exceeded
  Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.36.100.1, Local: 10.36.100.2

Logical interface dfc-0/0/0.1 (Index 68) (SNMP ifIndex 49)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Dynamic-Flow-Capture
  Input packets : 0
  Output packets: 402927263
  Protocol inet, MTU: 9192
  Flags: Receive-options, Receive-TTL-Exceeded

Logical interface dfc-0/0/0.2 (Index 69) (SNMP ifIndex 50)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Dynamic-Flow-Capture
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 9192
  Flags: Receive-options, Receive-TTL-Exceeded

Logical interface dfc-0/0/0.16383 (Index 70) (SNMP ifIndex 44)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Dynamic-Flow-Capture
  Input packets : 1427
  Output packets: 98
  Protocol inet, MTU: 9192
  Flags: Receive-options, Receive-TTL-Exceeded
  Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.0.16, Local: 10.0.0.1

```

show interfaces (Flow Collector)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>cp-fpc/pic/port:channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified flow collector interface. |
| Options | <p><i>cp-fpc/pic/port:channel</i>—Display standard status information about the specified flow collector interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Flow Collector) on page 630 |
| Output Fields | Table 124 on page 626 lists the output fields for the show interfaces (Flow Collector) command. Output fields are listed in the approximate order in which they appear. |

Table 124: Flow Collector Show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Physical Interface | | |
| Physical Interface | Name of the physical interface type. | All levels |
| Link | Status of the link: up or down . | All levels |
| Enabled | State of the interface type. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 124: Flow Collector Show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation type used on the physical interface. | All levels |
| MTU | Maximum Transmit Unit (MTU). Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Physical info | Information about the physical interface. | All levels |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive none |
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | Media access control (MAC) address of the interface. | detail extensive none |
| Alternate link address | Backup link address. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 124: Flow Collector Show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because the frames did not recognize them or were not of interest. Usually, this field reports protocols that JUNOS does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions —Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 124: Flow Collector Show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|--|-----------------------|
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface (such as iso or inet6). | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Route table in which this address exists; for example, Route table:0 refers to inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces      user@host> show interfaces extensive cp-5/0/0
extensive           Physical interface: cp-5/0/0, Enabled, Physical link is Up
(Flow Collector)    Interface index: 145, SNMP ifIndex: 52, Generation: 29
                      Type: Flow-collector, Link-level type: Flow-collection, MTU: 9192,
                      Clocking: Unspecified, Speed: 800mbps
                      Device flags   : Present Running
                      Interface flags: Point-To-Point SNMP-Traps 16384
                      Link type      : Full-Duplex
                      Link flags     : None
                      Physical info  : Unspecified
                      Hold-times     : Up 0 ms, Down 0 ms
                      Current address: Unspecified, Hardware address: Unspecified
                      Alternate link address: Unspecified
                      Last flapped   : 2005-05-24 16:48:11 PDT (00:12:04 ago)
                      Statistics last cleared: Never
                      Traffic statistics:
                        Input bytes   :          2041661287          0 bps
                        Output bytes  :          3795049544      43816664 bps
                        Input packets :           1365534          0 pps
                        Output packets:           3865644      3670 pps
                      Input errors:
                        Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
                        Policed discards: 0, Resource errors: 0
                      Output errors:
                        Carrier transitions: 2, Errors: 0, Drops: 0, MTU errors: 0,
                        Resource errors: 0

                      Logical interface cp-5/0/0.0 (Index 74) (SNMP ifIndex 53) (Generation 28)
                      Flags: Point-To-Point SNMP-Traps Encapsulation: Flow-collection
                      Traffic statistics:
                        Input bytes   :          1064651568
                        Output bytes  :           37144290
                        Input packets :           711324
                        Output packets:           713672
                      Local statistics:
                        Input bytes   :              0
                        Output bytes  :              0
                        Input packets :              0
                        Output packets:              0
                      Transit statistics:
                        Input bytes   :          1064651568          0 bps
                        Output bytes  :           37144290          0 bps
                        Input packets :           711324          0 pps
                        Output packets:           713672          0 pps
                      Protocol inet, MTU: 9192, Generation: 39, Route table: 0
                      Flags: Receive-options, Receive-TTL-Exceeded
                      Addresses, Flags: Is-Preferred Is-Primary
                        Destination: 4.0.0.2, Local: 4.0.0.1, Broadcast: Unspecified,
                        Generation: 40

                      Logical interface cp-5/0/0.1 (Index 75) (SNMP ifIndex 54) (Generation 29)
                      Flags: Point-To-Point SNMP-Traps Encapsulation: Flow-collection
                      Traffic statistics:
                        Input bytes   :          976793823
                        Output bytes  :          34099481
                        Input packets :           652729
                        Output packets:           655127
                      Local statistics:
                        Input bytes   :              0
                        Output bytes  :              0
                        Input packets :              0

```

```

Output packets:                0
Transit statistics:
Input bytes :                   976793823          0 bps
Output bytes :                   34099481          0 bps
Input packets:                   652729           0 pps
Output packets:                   655127           0 pps
Protocol inet, MTU: 9192, Generation: 40, Route table: 0
Flags: Receive-options, Receive-TTL-Exceeded
Addresses, Flags: Is-Preferred Is-Primary
Destination: 4.1.1.2, Local: 4.1.1.1, Broadcast: Unspecified,
Generation: 42

```

Logical interface cp-5/0/0.2 (Index 80) (SNMP ifIndex 55) (Generation 30)

Flags: Point-To-Point SNMP-Traps Encapsulation: Flow-collection

Traffic statistics:

```

Input bytes :                   0
Output bytes :                   3723079376
Input packets:                   0
Output packets:                   2495372

```

Local statistics:

```

Input bytes :                   0
Output bytes :                   0
Input packets:                   0
Output packets:                   0

```

Transit statistics:

```

Input bytes :                   0                  0 bps
Output bytes :                   3723079376         43816664 bps
Input packets:                   0                  0 pps
Output packets:                   2495372           3670 pps

```

Protocol inet, MTU: 9192, Generation: 41, Route table: 0

Flags: Receive-options, Receive-TTL-Exceeded

Addresses, Flags: Is-Preferred Is-Primary

Destination: 4.2.2.2, Local: 4.2.2.1, Broadcast: Unspecified,
Generation: 44

Logical interface cp-5/0/0.16383 (Index 81) (SNMP ifIndex 56) (Generation 31)

...

show interfaces (Flow Monitoring)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>mo-fpc/pic/port:channel</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified flow monitoring interface. |
| Options | <p><i>mo-fpc/pic/port:channel</i>—Display standard status information about the specified flow monitoring interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Flow Monitoring) on page 635 |
| Output Fields | Table 125 on page 632 lists the output fields for the show interfaces (Flow Monitoring) command. Output fields are listed in the approximate order in which they appear. |

Table 125: Flow Monitoring show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Link | Status of the link: up or down. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 125: Flow Monitoring show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Description | Description and name of the interface. | All levels |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation type used on the physical interface. | All levels |
| MTU | Maximum Transmit Unit (MTU). Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Physical info | Information about the physical interface. | All levels |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | Media access control (MAC) address of the interface. | detail extensive none |
| Alternate link address | Backup link address. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) | detail extensive |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 125: Flow Monitoring show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because the frames did not recognize them or were not of interest. Usually, this field reports protocols that JUNOS does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC Red mechanism. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 125: Flow Monitoring show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|--|-----------------------|
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface (such as iso or inet6). | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Route table in which this address exists; for example, Route table:0 refers to inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |

```

show interfaces      user@host> show interfaces mo-4/0/0 extensive
extensive           Physical interface: mo-4/0/0, Enabled, Physical link is Up
(Flow Monitoring)   Interface index: 144, SNMP ifIndex: 42, Generation: 28
                      Description: monitor pic 2
                      Type: Adaptive-Services, Link-level type: Adaptive-Services, MTU: Unlimited,
                      Clocking: Unspecified, Speed: 800mbps
                      Device flags   : Present Running
                      Interface flags: Point-To-Point SNMP-Traps 16384
                      Link type      : Full-Duplex
                      Link flags     : None
                      Physical info  : Unspecified
                      Hold-times     : Up 0 ms, Down 0 ms
                      Current address: Unspecified, Hardware address: Unspecified
                      Alternate link address: Unspecified
                      Last flapped   : 2005-05-24 16:43:12 PDT (00:17:46 ago)
                      Statistics last cleared: Never
                      Traffic statistics:
                        Input bytes   :          756824218          8328536 bps
                        Output bytes  :          872916185          8400160 bps
                        Input packets :           508452           697 pps
                        Output packets:          15577196          18750 pps
                      Input errors:
                        Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
                        Policed discards: 0, Resource errors: 0
                      Output errors:
                        Carrier transitions: 2, Errors: 0, Drops: 0, MTU errors: 0,
                        Resource errors: 0

                      Logical interface mo-4/0/0.0 (Index 83) (SNMP ifIndex 43) (Generation 26)
                      Flags: Point-To-Point SNMP-Traps Encapsulation: Adaptive-Services
                      Traffic statistics:
                        Input bytes   :          756781796
                        Output bytes  :          872255328

```

```
Input packets:          507233
Output packets:        15575988
Local statistics:
Input bytes  :           0
Output bytes :           0
Input packets:          0
Output packets:         0
Transit statistics:
Input bytes  :       756781796      8328536 bps
Output bytes :       872255328      8400160 bps
Input packets:       507233         697 pps
Output packets:    15575988        18750 pps
Protocol inet, MTU: Unlimited, Generation: 38, Route table: 0
Flags: None
```

```
Logical interface mo-4/0/0.16383 (Index 84) (SNMP ifIndex 58) (Generation 27)
```

```
...
```


Chapter 22

Link Services Interface Operational Mode Commands

Table 126 on page 637 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot link services, link services IQ, and multilink services interfaces.

Table 126: Link Services Interface Operational Mode Commands

| Task | Command |
|---|--|
| Display status information about link services interfaces. | show interfaces (Link Services) |
| Display status information about link services IQ interfaces. | show interfaces (Link Services IQ) |
| Display status information about multilink services interfaces. | show interfaces (Multilink Services) |
| Display status information about redundant link services IQ interfaces. | show interfaces (Redundant Link Services IQ) |

show interfaces (Link Services)

Syntax For Multilink Frame Relay user-to-user network-to-network interface (UNI NNI):

```
show interfaces interface-type :channel
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index snmp-index>
<statistics>
```

For Multilink Frame Relay end-to-end:

```
show interfaces interface-type
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index snmp-index>
<statistics>
```

Release Information Command introduced before JUNOS Release 7.4.

Description Display status information about the specified link services interface.

Options *interface-type*—On M-series and T-series routing platforms, the interface type is *ls-fpc/pic/port*. On the J-series routing platform, the interface type is *ls-pim/0/port*.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output show interfaces extensive (MFR UNI NNI) on page 646
show interfaces extensive (MFR End-to-End) on page 648

Output Fields Table 127 on page 638 lists the output fields for the **show interfaces** (link services) command. Output fields are listed in the approximate order in which they appear.

Table 127: Link Services show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---------------------------------|-----------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface: Multilink-Frame-Relay-UNI-NNI (default), LinkService , Frame-relay , Frame-relay-ccc , or Frame-relay-tcc . | All levels |
| MTU | Maximum transmission unit size on the physical interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Hold-times | Current interface hold time up and hold time down, in milliseconds, in the format Up <i>n</i> ms, Down <i>n</i> ms . | detail extensive |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Multilink Frame Relay UNI NNI bundle options | <p>Multilink Frame Relay UNI NNI only) Configured information about Multilink Frame Relay bundle options.</p> <ul style="list-style-type: none"> ■ Device type—DCE (Data Communication Equipment) or DTE (Data Terminal Equipment). ■ MRRU—Configured size of the maximum received reconstructed unit (MRRU): 1500 to 4500 bytes. The default is 1524 bytes. ■ Fragmentation threshold—Configured fragmentation threshold: 128 through 16,320 bytes, in integer multiples of 64 bytes. The default setting is 0, which disables fragmentation. ■ Red differential delay limit—Red differential delay limit among bundle links has been reached, indicating an action will occur. ■ Yellow differential delay limit—Yellow differential delay among bundle links has been reached, indicating a warning will occur. ■ Red differential delay action—Type of actions taken when the red differential delay exceeds the red limit: Disable link transmit or Remove link from service. ■ Reassembly drop timer—Drop timeout value to provide a recovery mechanism if individual links in the link services bundle drop one or more packets: 1 through 127 milliseconds. By default, the drop timeout parameter is 0 (disabled). A value that is under 5 ms is not recommended. ■ Links needed to sustain bundle—Minimum number of links to sustain the bundle: 1 through 8. ■ LIP Hello timer—Link Interleaving Protocol hello timer: 1 through 180 seconds. <ul style="list-style-type: none"> ■ Acknowledgement timer—Maximum period to wait for an add link acknowledgement, hello acknowledgement, or remove link acknowledgement: 1 through 10 seconds. ■ Acknowledgement retries—Number of retransmission attempts to be made for consecutive hello or remove link messages after the expiration of the acknowledgement timer: 1 through 5. | detail extensive none |
| Multilink Frame Relay UNI NNI bundle options (continued) | <ul style="list-style-type: none"> ■ Bundle class—Bundle class ID. ■ LMI type—Multilink Frame Relay UNI NNI LMI type: ANSI or Q.933 ANNEX A. <ul style="list-style-type: none"> ■ T391 LIV polling timer—Multilink Frame Relay UNI NNI Full status polling counter: 1 through 255, with a default value of 6. ■ T392 polling verification timer—Multilink Frame Relay UNI NNI LMI error threshold. The number of errors required to bring down the link, within the event count specified by N393. The range is 1 through 10, with a default value of 3. ■ N391 full status polling count—Multilink Frame Relay UNI NNI Full status polling counter: 1 through 255. ■ N392 error threshold—Multilink Frame Relay UNI NNI LMI error threshold: 1 through 10. ■ N393 monitored event count—Multilink Frame Relay UNI NNI LMI monitored event count: 1 through 10, with a default value of 4. | detail extensive none |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router.</p> | detail extensive |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Multilink Frame Relay UNI NNI bundle errors | Information about Multilink Frame Relay bundle errors. <ul style="list-style-type: none"> ■ Packet drops—Number of packets dropped. ■ Fragment drops—Number of fragments dropped. ■ MRRU exceeded—Number of times a packet was dropped because the configured MRRU value was exceeded. ■ Exception events—Exception events counter. | detail extensive |
| Multilink Frame Relay UNI NNI bundle statistics | Information about Multilink Frame Relay bundles. <ul style="list-style-type: none"> ■ Fragments—Bundle fragment information. <ul style="list-style-type: none"> ■ Input—Total number and rate of frames and packets received, in Frames, fps (frames per second), Bytes, and bps (bits per second). ■ Output—Total number and rate of frames and packets transmitted, in Frames, fps, Bytes, and bps. ■ Packets—Bundle packet information. <ul style="list-style-type: none"> ■ Input—Total number and rate of frames and packets received, in Frames, fps (frames per second), Bytes, and bps (bits per second). ■ Output—Total number and rate of frames and packets transmitted, in Frames, fps, Bytes, and bps. | detail extensive |
| Multilink Frame Relay UNI NNI bundle links information | <ul style="list-style-type: none"> ■ Active bundle links—Number of bundle links that are currently active. ■ Removed bundle links—Number of bundle links that have been removed (RED differential delay action). ■ Disabled bundle links—Number of bundle links that have been disabled (RED differential delay action). | detail extensive none |
| Multilink Frame Relay UNI NNI active bundle links statistics | (Multilink Frame Relay UNI NNI only) Display information for each active bundle link. <ul style="list-style-type: none"> ■ Frames—Number of multilink control frames received on this bundle link. ■ fps—Rate of multilink control frames received on this bundle link (in frames per second). ■ Bytes—Number of bytes received on this bundle link. ■ bps—Number of bits per second received on this bundle link. ■ <i>interface-name</i>—Name of the bundle link interface. ■ Input—Total number and rate of frames and packets received. ■ Output—Total number and rate of frames and packets transmitted. ■ Current differential delay—Compare this bundle link's round trip time to the average of all bundle links' round trip times in ms (milliseconds). ■ Recent high differential delay—Highest differential delay value from the latest 10 intervals, in milliseconds. ■ Times over red diff delay—Number of times this bundle link exceeded the configured red differential delay limit. ■ Times over yellow diff delay—Number of times this bundle link exceeded the configured yellow differential delay limit. | detail extensive link |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---|---|------------------|
| Multilink Frame Relay UNI NNI active bundle links statistics (continued) | <ul style="list-style-type: none"> ■ LIP—Link Interleaving Protocol information. ■ Rcv—Number of messages received. ■ Xmt—Number of messages transmitted. ■ add_inlk—ADD_LINK message notifies the peer endpoint that the local endpoint supports frame processing. It is generated on both ends of a bundle link when a bundle link endpoint is ready to become operational. ■ Inlk_ack—ADD_LINK_ACK message notifies the peer that the local router has received a valid ADD_LINK message. ■ Inlk_rej—ADD_LINK_REJ message notifies the peer that the local router has received an invalid ADD_LINK message. ■ hello—HELLO message notifies the peer that the local router is up. Both ends of a link bundle generate this message. ■ hel_ack—HELLO_ACK message notifies the peer that the local router has received a valid HELLO message. ■ Inlk_rem—REMOVE_LINK message notifies the peer that the local router has received a REMOVE_LINK message. ■ rem_ack—REMOVE_LINK_ACK message notifies the peer that the local router has received a valid ADD_LINK message. | detail extensive |
| Frame exceptions | <p>For Multilink Frame Relay end-to-end only. Information about framing exceptions. Includes events recorded under Exception Events for each logical interface.</p> <ul style="list-style-type: none"> ■ Oversized frames—Number of frames received that exceed maximum frame length. Maximum length is 4500 Kb (kilobits). ■ Errored input frames—Number of input frame errors. ■ Input on disabled link/bundle—Number of frames received on disabled links. These frames can result either from an inconsistent configuration, or from a bundle or link being brought up or down with traffic actively flowing through it. ■ Output for disabled link/bundle—Number of frames sent for a disabled or unavailable link. These frames can result either from an inconsistent configuration, or from a bundle being brought up or down while traffic is flowing through it. ■ Queuing drops—Total number of packets dropped before traffic enters the link services IQ interface. Indicates that the interface is becoming oversubscribed. | detail extensive |
| Buffering exceptions | <p>For Multilink Frame Relay end-to-end only. Information about buffering exceptions. Includes events recorded under Exception Events for each logical interface.</p> <ul style="list-style-type: none"> ■ Packet data buffer overflow—Packet buffer memory is full. This overflow can occur when the aggregate data rate exceeds the physical link services interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory is full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical link services interface capacity. Check the logical interface exception event counters to determine which bundle is responsible. | detail extensive |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|---------------------------------|--|------------------|
| Assembly exceptions | <p>For Multilink Frame Relay end-to-end only. Information about assembly exceptions. Includes events recorded under Exception Events for each logical interface.</p> <p>An assembly exception does not necessarily indicate an operational problem with the physical link services interface itself. If multilink-encapsulated traffic is dropped or reordered after a sequence number has been assigned, the assembling multilink interface records one or more exception events. The multilink interface can drop multilink-encapsulated fragments itself as a result. Any multilink packets or fragments dropped by the physical link services interface itself result in packet or fragment drop counts on individual logical interfaces. If the logical interface drop counts are zero, but exception events are seen, the most likely cause is a problem with the individual link interfaces. Even if the logical interface fragment drop counts are nonzero, excess differential delay or traffic losses on individual interfaces can be the root cause.</p> | detail extensive |
| Assembly exceptions (continued) | <ul style="list-style-type: none"> ■ Fragment timeout—The drop timer expired while a fragment sequence number was outstanding. Occurs only if the drop timer is enabled. This timeout can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. These events do not necessarily indicate any problem with the operation of the physical link services interface itself, but can occur when one or more individual links drop traffic. Check the logical interface exception event counters to determine which bundle is responsible. ■ Missing sequence number—A gap was detected in the sequence numbers of fragments on a bundle. These events do not necessarily indicate any problem with the operation of the physical link services interface itself, but can occur when one or more individual links drop traffic. Check the logical interface exception event counters to determine which bundle is responsible. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the multilink interface unable to correctly process the resulting stream. Check the logical interface exception event counters to determine which bundle is responsible. ■ Out-of-range sequence number—Received a frame with an out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. Check the logical interface exception event counters to determine which bundle is responsible. | detail extensive |
| Hardware errors | <p>For Multilink Frame Relay end-to-end only. Information about hardware errors.</p> <ul style="list-style-type: none"> ■ Data memory error—A memory error was detected on the interface DRAM. Indicates possible hardware failure. Contact Juniper Networks technical support. ■ Control memory error—A memory error was detected on the interface DRAM. Indicates possible hardware failure. Contact Juniper Networks technical support. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation being used. | All levels |
| Bandwidth | Speed at which the interface is running. | All levels |
| Bundle options | <p>For Multilink Frame Relay end-to-end interfaces only:</p> <ul style="list-style-type: none"> ■ MRRU—Configured size of the maximum received reconstructed unit (MRRU): 1500 to 4500 bytes. The default is 1524 bytes. ■ Drop timer period—Drop timeout value to provide a recovery mechanism if individual links in link services bundle drop one or more packets: 1 through 127 milliseconds. Values under 5 milliseconds are not recommended. The default setting is 0, which disables the timer. ■ Sequence number format—(MLPPP) Short sequence number header format. ■ Fragmentation threshold—Configured fragmentation threshold: 128 through 16,320 bytes, in integer multiples of 64 bytes. The default setting is 0, which disables fragmentation. ■ Links needed to sustain bundle—Minimum number of links to sustain the bundle: 1 through 8. ■ Interleave fragments—State of the process that interleaves long packets with high-priority ones. Only Disabled is currently supported. ■ Remote MRRU—MRRU value received from remote peer. If negotiation has not been initiated, the default value is displayed. | detail extensive none |
| Bundle status (MLPPP) or Multilink class status (MC-MLPPP) | <p>Information about bundle status.</p> <ul style="list-style-type: none"> ■ Remote MRRU—MRRU value received from remote peer. If negotiation has not been initiated, the default value is displayed. ■ Received sequence number—Sequence number for received packets. ■ Transmit sequence number—Sequence number for transmitted packets. ■ Packet drops—Number and byte count of output packets that were dropped, rather than being encapsulated and sent out of the router as fragments. The packet drop counter is incremented if there is a temporary shortage of packet memory on the AS PIC, which causes packet fragmentation to fail. ■ Fragment drops—Number and byte count of input fragments that were dropped, rather than being reassembled and handled by the router as packets. This counter also includes fragments that have been received successfully but had to be dropped because not all fragments that constituted a packet had been received. The fragment drop counter is incremented when a fragment received on constituent links is dropped. Drop fragments can be triggered by sequence ordering errors, duplicate fragments, timed-out fragments, and bad multilink headers. | detail extensive none |

Table 127: Link Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| Bundle status (MLPPP) or Multilink class status (MC-MLPPP) (continued) | <ul style="list-style-type: none"> ■ MRRU exceeded—Number of reassembled packets exceeding the MRRU. This counter is not implemented in this release. ■ Fragment timeout—Drop timer expired while a fragment sequence number was outstanding. Occurs only if the drop timer is enabled. This timeout can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. ■ Missing sequence number—Gap detected in the sequence numbers of fragments on a bundle. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the multilink interface unable to correctly process the resulting stream. ■ Out-of-range sequence number—Frame with an out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. ■ Packet data buffer overflow—Packet buffer memory full. This overflow can occur when the aggregate data rate exceeds the physical link services IQ interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical link services IQ capacity. | detail extensive none |
| Bundle errors | <p>Information about bundle errors.</p> <ul style="list-style-type: none"> ■ Packet drops—Number and byte count of output packets that were dropped, rather than being encapsulated and sent out of the router as fragments. ■ Fragment drops—Number and byte count of input fragments that were dropped, rather than being reassembled and handled by the router as packets. ■ MRRU exceeded—Number of reassembled packets exceeding the MRRU. ■ Exception events—Number of exceptional events encountered other than MRRU exceeded errors. These events are categorized under the physical interface: Frame exceptions, Buffering exceptions, and Fragment exceptions. Exception events do not necessarily indicate that the multilink interface is not operating properly. Individual link failures can produce exceptional events. | detail extensive |
| Statistics | <p>Information about fragments and packets received and sent by the router. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router.</p> <ul style="list-style-type: none"> ■ Bundle—Information about bundles. ■ Link—Information about links used in the multilink operation. | detail extensive |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |

Table 127: Link Services show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| MTU | MTU size on the logical interface. If the MTU value is negotiated down to meet the MRRU requirement on the remote side, this value is marked Adjusted . | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which this address exists. For example, Route table:0 refers to inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |

**show interfaces
extensive (MFR UNI
NNI)**

```

user@host> show interfaces ls-1/3/0:0 extensive
Physical interface: ls-1/3/0:0, Enabled, Physical link is Up
Interface index: 25, SNMP ifIndex: 35, Generation: 124
Link-level type: Multilink-FR-UNI-NNI, MTU: 1524
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Last flapped : 2002-11-01 15:26:25 PST (00:34:49 ago)
Statistics last cleared: Never
Link flags : None
Hold-times : Up 0 ms, Down 0 ms
Multilink Frame Relay UNI NNI bundle options:
  Device type           DTE
  MRRU                  1524
  Fragmentation threshold 1500
  Red differential delay limit 10
  Yellow differential delay limit 6
  Red differential delay action Disable link transmit
  Reassembly drop timer 0
  Links needed to sustain bundle 1
  LIP Hello timer       10
    Acknowledgement timer 4
    Acknowledgement retries 2
  Bundle class          A
  LMI type               Q.933 Annex A
    T391 LIV polling timer 10
    T392 polling verification timer 15
    N391 full status polling count 6
    N392 error threshold 3
    N393 monitored event count 4
Traffic statistics:
Input bytes : 0

```

```

Output bytes : 0
Input packets: 0
Output packets: 0
Multilink Frame Relay UNI NNI bundle errors:
  Packet drops 0 (0 bytes)
  Fragment drops 0 (0 bytes)
  MRRU exceeded 0
  Exception events 0
Multilink Frame Relay UNI NNI bundle statistics
      Frames      fps      Bytes      bps
Fragments:
  Input : 0 0 0 0
  Output: 824 0 17304 320
Packets:
  Input : 0 0 0 0
  Output: 824 0 17304 320
Multilink Frame Relay UNI NNI bundle links info:
  Active bundle links 4
  Removed bundle links 0
  Disabled bundle links 0
Multilink Frame Relay UNI NNI active bundle links statistics:
      Frames      fps      Bytes      bps
t1-0/2/0:0.0
  Input : 0 0 0 0
  Output: 206 0 4326 80
  Current differential delay 0.2 ms
  Recent high differential delay 3.8 ms
  Times over red diff delay 0
  Times over yellow diff delay 0
  LIP:add_lnk lnk_ack lnk_rej hello hel_ack lnk_rem rem_ack
  Rcv: 2 2 0 206 207 0 0
  Xmt: 2 1 0 207 206 0 0
t1-0/2/0:1.0
  Input : 0 0 0 0
  Output: 206 0 4326 80
  Current differential delay 0.2 ms
  Recent high differential delay 3.7 ms
  Times over red diff delay 0
  Times over yellow diff delay 0
  LIP:add_lnk lnk_ack lnk_rej hello hel_ack lnk_rem rem_ack
  Rcv: 2 2 0 206 207 0 0
  Xmt: 2 1 0 207 206 0 0
t1-0/2/0:2.0
  Input : 0 0 0 0
  Output: 206 0 4326 80
  Current differential delay 0.4 ms
  Recent high differential delay 3.8 ms
  Times over red diff delay 0
  Times over yellow diff delay 0
  LIP:add_lnk lnk_ack lnk_rej hello hel_ack lnk_rem rem_ack
  Rcv: 2 2 0 206 207 0 0
  Xmt: 2 1 0 207 206 0 0
t1-0/2/0:3.0
  Input : 0 0 0 0
  Output: 206 0 4326 80
  Current differential delay 0.3 ms
  Recent high differential delay 3.8 ms
  Times over red diff delay 0
  Times over yellow diff delay 0
  LIP:add_lnk lnk_ack lnk_rej hello hel_ack lnk_rem rem_ack

```

```

Rcv:      2      2      0      206      207      0      0
Xmt:      2      1      0      207      206      0      0
Logical interface ls-1/3/0:0.0 (Index 5) (SNMP ifIndex 28) (Generation 10)
Flags: Point-To-Point SNMP-Traps Encapsulation: Multilink-FR-UNI-NNI
Bandwidth: 622080kbps
Bundle errors:
  Packet drops                0 (0 bytes)
  Fragment drops              0 (0 bytes)
  MRRU exceeded               0
  Exception events            0
Statistics      Frames      fps      Bytes      bps
Bundle:
  Fragments:
    Input :          0          0          0          0
    Output:         824          0        17304         320
  Packets:
    Input :          0          0          0          0
    Output:         824          0        17304         320
Link:
  t1-0/2/0:0.0
    Input :          0          0          0          0
    Output:         206          0         4326          80
  t1-0/2/0:1.0
    Input :          0          0          0          0
    Output:         206          0         4326          80
  t1-0/2/0:2.0
    Input :          0          0          0          0
    Output:         206          0         4326          80
  t1-0/2/0:3.0
    Input :          0          0          0          0
    Output:         206          0         4326          80
Protocol inet, MTU: 1500 [Adjusted], Generation: 15, Route table: 0
Flags: User-MTU, MTU-Protocol-Adjusted
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 1.1.1.1, Local: 1.1.1.2, Broadcast: Unspecified,
  Generation: 10

```

**show interfaces
extensive (MFR
End-to-End)**

```

user@host> show interfaces ls-0/3/0 extensive
Physical interface: ls-0/3/0, Enabled, Physical link is Up
Interface index: 264, SNMP ifIndex: 104, Generation: 525
Link-level type: LinkService, MTU: 1524
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps
Last flapped  : 2002-10-16 17:53:49 PDT (00:22:00 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          73471          264 bps
  Output bytes:          80335           0 bps
  Input packets:           822           0 pps
  Output packets:          819           0 pps
Frame exceptions:
  Oversized frames          0
  Errored input frames      0
  Input on disabled link/bundle 0
  Output for disabled link/bundle 4
  Queuing drops             3
Buffering exceptions:
  Packet data buffer overflow 0
  Fragment data buffer overflow 0
Assembly exceptions:
  Fragment timeout          0

```

```

Missing sequence number          0
Out-of-order sequence number     0
Out-of-range sequence number     0
Hardware errors (sticky):
  Data memory error              0
  Control memory error           0
Logical interface ls-0/3/0.0 (Index 5) (SNMP ifIndex 527) (Generation 47)
Flags: Point-To-Point SNMP-Traps Encapsulation: Multilink-PPP
Bandwidth: 1536kbps
Bundle options:
  MRRU                          1524
  Drop timer period             0
  Sequence number format        long (24 bits)
  Fragmentation threshold       0
  Links needed to sustain bundle 1
  Interleave fragments          Disabled
Bundle status:
  Remote MRRU                   1500
  Received sequence number       0x19ec14
  Transmit sequence number       0x38cfa8
  Packet drops                   0 (0 bytes)
  Fragment drops                 0 (0 bytes)
  MRRU exceeded                  0
  Fragment timeout               0
  Missing sequence number        0
  Out-of-order sequence number   0
  Out-of-range sequence number   0
  Packet data buffer overflow    0
  Fragment data buffer overflow  0
Bundle errors:
  Packet drops                   2 (68 bytes)
  Fragment drops                 0 (0 bytes)
  MRRU exceeded                  0
  Exception events               0
Statistics      Frames      fps      Bytes      bps
Bundle:
  Fragments:
    Input :      172        0      15544      288
    Output:      165        0      16645        0
  Packets:
    Input :      143        0      12885      288
    Output:      134        0      12276        0
Link:
  t1-0/0/0.0
    Input :      143        0      12885      288
    Output:      134        0      12276        0
Protocol inet, MTU: 1500, Generation: 76, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.16.1.2, Local: 10.16.1.1, Broadcast:
  Unspecified, Generation: 81
Protocol iso, MTU: 1500 [Adjusted], Generation: 77, Route table: 0
Flags: Is-Primary
Protocol inet6, MTU: 1500, Generation: 78, Route table: 0
Flags: Is-Primary
Addresses, Flags: Is-Default Is-Preferred Is-Primary
  Destination: 8016::1:0/126, Local: 8016::1:1,
  Broadcast: Unspecified, Generation: 83
Addresses, Flags: Is-Preferred
  Destination: fe80::/64, Local: fe80::2a0:a5ff:fe12:4777,

```

Broadcast: Unspecified,
Generation: 85

show interfaces (Link Services IQ)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>lsq-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified link services intelligent queuing (IQ) interface. |
| Options | <p><i>lsq-fpc/pic/port</i>—Display standard status information about the specified link services IQ interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Additional Information | Link services IQ interfaces are similar to link services interfaces. The important difference is that link services IQ interfaces fully support JUNOS class-of-service (CoS) components. |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces extensive (MLPPP on Link Services IQ) on page 660</p> <p>show interfaces extensive (MC-MLPPP on Link Services IQ) on page 661</p> <p>show interfaces extensive (MLPPP on Link Services IQ Bundle) on page 663</p> |
| Output Fields | Table 128 on page 651 lists the output fields for the show interfaces (link services IQ) command. Output fields are listed in the approximate order in which they appear. |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface: Multilink-Frame-Relay-UNI-NNI (default), LinkService , Frame-relay , Frame-relay-ccc , or Frame-relay-tcc . | All levels |
| MTU | Maximum transmission unit size on the physical interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Input rate | (Redundant LSQ) Rate of bits and packets received on the interface. | None specified |
| Output rate | (Redundant LSQ) Rate of bits and packets transmitted on the interface. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router. | detail extensive |
| Frame exceptions | <p>Information about framing exceptions. Includes events recorded under Exception Events for each logical interface.</p> <ul style="list-style-type: none"> ■ Oversized frames—Number of frames received that exceed maximum frame length. Maximum length is 4500 Kb (kilobits). ■ Errored input frames—Number of input frame errors. ■ Input on disabled link/bundle—Number of frames received on disabled links. These frames can result either from an inconsistent configuration, or from a bundle or link being brought up or down with traffic actively flowing through it. ■ Output for disabled link/bundle—Number of frames sent for a disabled or unavailable link. These frames can result either from an inconsistent configuration, or from a bundle being brought up or down while traffic is flowing through it. ■ Queuing drops—Total number of packets dropped before traffic enters the link services IQ interface. Indicates that the interface is becoming oversubscribed. | extensive |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------------|---|-----------------|
| Buffering exceptions | <p>Information about buffering exceptions. Includes events recorded under Exception Events for each logical interface.</p> <ul style="list-style-type: none"> ■ Packet data buffer overflow—Packet buffer memory is full. This overflow can occur when the aggregate data rate exceeds the physical link services IQ interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory is full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical link services IQ capacity. Check the logical interface exception event counters to determine which bundle is responsible. | extensive |
| Assembly exceptions | <p>(Multilink Frame Relay end-to-end only) Information about assembly exceptions. Includes events recorded under Exception Events for each logical interface.</p> <p>An assembly exception does not necessarily indicate an operational problem with the physical link services IQ interface itself. If multilink-encapsulated traffic is dropped or reordered after a sequence number has been assigned, the interface records one or more exception events. The physical interface can drop multilink-encapsulated fragments itself as a result. Any multilink packets or fragments dropped by the interface itself result in packet or fragment drop counts on individual logical interfaces. If the logical interface drop counts are zero, but exception events are seen, the most likely cause is a problem with the individual link interfaces. Even if the logical interface fragment drop counts are nonzero, excess differential delay or traffic losses on individual interfaces can be the root cause.</p> <ul style="list-style-type: none"> ■ Fragment timeout—The drop timer expired while a fragment sequence number was outstanding. Occurs only if the drop timer is enabled. This timeout can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. These events do not necessarily indicate any problem with the operation of the physical link services IQ interface itself, but can occur when one or more individual links drop traffic. Check the logical interface exception event counters to determine which bundle is responsible. ■ Missing sequence number—A gap was detected in the sequence numbers of fragments on a bundle. These events do not necessarily indicate any problem with the operation of the physical link services IQ interface itself, but can occur when one or more individual links drop traffic. Check the logical interface exception event counters to determine which bundle is responsible. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the link services IQ interface unable to correctly process the resulting stream. Check the logical interface exception event counters to determine which bundle is responsible. ■ Out-of-range sequence number—Received a frame with an out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. Check the logical interface exception event counters to determine which bundle is responsible. | extensive |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Hardware errors (sticky) | (Multilink Frame Relay end-to-end only) Information about hardware errors. <ul style="list-style-type: none"> ■ Data memory error—A memory error was detected on the interface DRAM. Indicates possible hardware failure. Contact Juniper Networks technical support. ■ Control memory error—A memory error was detected on the interface DRAM. Indicates possible hardware failure. Contact Juniper Networks technical support. | extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive none |
| Queue counters | Queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive none |
| Logical Interface | | |
| Logical interface | Name of the logical interface | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation being used: PPP or Multilink PPP. | All levels |
| Bandwidth | Speed at which the interface is running. | All levels |
| Bundle options | (Multilink Frame Relay end-to-end interfaces only) <ul style="list-style-type: none"> ■ MRRU—Configured size of the maximum received reconstructed unit (MRRU): 1500 through 4500 bytes. The default is 1504 bytes. ■ Drop timer period—Drop timeout value to provide a recovery mechanism if individual links in link services bundle drop one or more packets: 0 through 2000 milliseconds. Values under 5 ms are not recommended. The default setting is 0, which disables the timer. ■ Sequence number format—Short sequence number header format (MLPPP only). ■ Fragmentation threshold—Configured fragmentation threshold: 64 through 16,320 bytes, in integer multiples of 64 bytes. The default setting is 0, which disables fragmentation. ■ Links needed to sustain bundle—Minimum number of links to sustain the bundle: 1 through 8. ■ Multilink classes—Number of multilink classes negotiated. ■ Link layer overhead—Percentage of bundle bandwidth to be set aside for link-layer overhead. | detail extensive none |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|---|-----------------------|
| Bundle status (MLPPP) or Multilink class status (MC-MLPPP) | <p>Information about bundle status.</p> <ul style="list-style-type: none"> ■ Remote MRRU—MRRU value received from remote peer. If negotiation has not been initiated, the default value is displayed. ■ Received sequence number—Sequence number for received packets. ■ Transmitted sequence number—Sequence number for transmitted packets. ■ Packet drops—Number and byte count of output packets that were dropped, rather than being encapsulated and sent out of the router as fragments. The packet drop counter is incremented if there is a temporary shortage of packet memory on the AS PIC, which causes packet fragmentation to fail. ■ Fragment drops—Number and byte count of input fragments that were dropped, rather than being reassembled and handled by the router as packets. This counter also includes fragments that have been received successfully but had to be dropped because not all fragments that constituted a packet had been received. The fragment drop counter is incremented when a fragment received on constituent links is dropped. Drop fragments can be triggered by sequence ordering errors, duplicate fragments, timed-out fragments, and bad multilink headers. ■ MRRU exceeded—Number of reassembled packets exceeding the MRRU. This counter is not implemented in this release. ■ Fragment timeout—The drop timer expired while a fragment sequence number was outstanding. Occurs only if the drop timer is enabled. This timeout can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. ■ Missing sequence number—A gap was detected in the sequence numbers of fragments on a bundle. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the multilink interface unable to correctly process the resulting stream. ■ Out-of-range sequence number—Received a frame with an out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. ■ Packet data buffer overflow—Packet buffer memory is full. This overflow can occur when the aggregate data rate exceeds the physical link services IQ interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory is full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical link services IQ capacity. | detail extensive none |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------|---|-----------------------|
| Statistics | <p>Information about fragments and packets received and sent by the router. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router. Each field has columns that indicate the number of frames received and transmitted, frames per second (fps), the number of bytes received and transmitted, and bits per second (bps).</p> <ul style="list-style-type: none"> ■ Bundle—Information for each active bundle link. <ul style="list-style-type: none"> ■ Fragments: Input and Output—Total number and rate of fragments received and transmitted. ■ Packets: Input and Output—Total number and rate of packets received and transmitted. ■ Multilink class—(MC-MLPPP only) Information about multiclass links used in the multilink operation. ■ Link—Information about links used in the multilink operation. <ul style="list-style-type: none"> ■ Link name—Interface name of the link services IQ channel and state information (physical link up or down). ■ Input and Output—Total number and rate of fragments and packets received and transmitted. | detail extensive |
| NCP state | <p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> ■ Conf-ack-received—Acknowledgement was received. ■ Conf-ack-sent—Acknowledgement was sent. ■ Conf-req-sent—Request was sent. ■ Down—NCP negotiation is incomplete (not yet completed or has failed). ■ Not-configured—NCP is not configured on the interface. ■ Opened—NCP negotiation is successful. | detail extensive none |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. If the MTU value is negotiated down to meet the MRRU requirement on the remote side, this value is marked Adjusted . | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Routing table in which this address exists. For example, Route table:0 refers to inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the addresses configured on the logical interface. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address on the logical interface. | detail extensive none |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------------|---|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| MLPPP Bundle Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| SNMP-Traps | SNMP trap notifications are enabled. | All levels |
| Encapsulation | Encapsulation being used: PPP, Multilink PPP or Multilink-FR. | All levels |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Bandwidth | Speed at which the interface is running. | All levels |
| Bundle links information | Information about the bundled links. <ul style="list-style-type: none"> ■ Active bundle links—Number of active links. ■ Removed bundle links—Information about links used in the multilink operation. ■ Disabled bundle links—Number of disabled links. | detail extensive none |
| Bundle options | (Multilink Frame Relay end-to-end interfaces only) <ul style="list-style-type: none"> ■ MRRU—Configured size of the maximum received reconstructed unit (MRRU): 1500 through 4500 bytes. The default is 1504 bytes. ■ Drop timer period—Drop timeout value to provide a recovery mechanism if individual links in link services bundle drop one or more packets: 0 though 2000 milliseconds. Values under 5 ms are not recommended. The default setting is 0, which disables the timer. ■ Inner PPP Protocol field compression —Inner PPP protocol compression is enabled or disabled. ■ Sequence number format—Short sequence number header format (MLPPP only). ■ Fragmentation threshold—Configured fragmentation threshold: 64 through 16,320 bytes, in integer multiples of 64 bytes. The default setting is 0, which disables fragmentation. ■ Links needed to sustain bundle—Minimum number of links to sustain the bundle: 1 through 8. ■ Multilink classes—Number of multilink classes negotiated. ■ Link layer overhead—Percentage of bundle bandwidth to be set aside for link-layer overhead. | detail extensive none |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Bundle status (MLPPP) | <p>Information about bundle status.</p> <ul style="list-style-type: none"> ■ Received sequence number—Sequence number for received packets. ■ Transmit sequence number—Sequence number for transmitted packets. ■ Packet drops—Number and byte count of output packets that were dropped, rather than being encapsulated and sent out of the router as fragments. The packet drop counter is incremented if there is a temporary shortage of packet memory on the AS PIC, which causes packet fragmentation to fail. ■ Fragment drops—Number and byte count of input fragments that were dropped, rather than being reassembled and handled by the router as packets. This counter also includes fragments that have been received successfully but had to be dropped because not all fragments that constituted a packet had been received. The fragment drop counter is incremented when a fragment received on constituent links is dropped. Drop fragments can be triggered by sequence ordering errors, duplicate fragments, timed-out fragments, and bad multilink headers. ■ MRRU exceeded—Number of reassembled packets exceeding the MRRU. This counter is not implemented in this release. ■ Fragment timeout—The drop timer expired while a fragment sequence number was outstanding. Occurs only if the drop timer is enabled. This timeout can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. ■ Missing sequence number—A gap was detected in the sequence numbers of fragments on a bundle. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the multilink interface unable to correctly process the resulting stream. ■ Out-of-range sequence number—Received a frame with an out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. ■ Packet data buffer overflow—Packet buffer memory is full. This overflow can occur when the aggregate data rate exceeds the physical link services IQ interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory is full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical link services IQ capacity. | detail extensive none |

Table 128: Link Services IQ and Redundant Link Services IQ show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------------|---|-----------------------|
| Statistics | <p>Information about frames, bytes, and bits per second received and sent by the router. All references to traffic direction (input or output) are defined with respect to the router. Each field has columns that indicate the number of frames received and transmitted, frames per second (fps), the number of bytes received and transmitted, and bits per second (bps).</p> <ul style="list-style-type: none"> ■ Bundle—Information for each active bundle link. <ul style="list-style-type: none"> ■ Multilink: Input and Output—Total number and rate of multilink frames, bytes, and bits per second received and transmitted. ■ Network: Input and Output—Total number of multilink frames, bytes, and bits per second received and transmitted. ■ Link—Information about links used in the multilink operation. <ul style="list-style-type: none"> ■ Link name is the interface name of the link services IQ channel and state information (physical link up or down) and up time. ■ Input and Output—Total number and rate of frames, bytes, and bits per second received and transmitted. | extensive |
| Multilink detail statistics | <p>Frames, bytes, and bits per second received and sent by the bundle. All references to traffic direction (input or output) are defined with respect to the router. Each field has columns that indicate the number of frames received and transmitted, frames per second (fps), the number of bytes received and transmitted, and bits per second (bps).</p> <ul style="list-style-type: none"> ■ Bundle—Information for the bundle link. <ul style="list-style-type: none"> ■ Fragments: Input and Output—Total number and rate of multilink fragments received and transmitted. ■ Non-fragments: Input and Output—Total number and rate of nonfragmented multilink frames received and transmitted. ■ LFI: Input and Output—Total number and rate of link fragmented and interleaved frames and bytes. | extensive |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. If the MTU value is negotiated down to meet the MRRU requirement on the remote side, this value is marked Adjusted . | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Routing table in which this address exists. For example, Route table:0 refers to inet.0. | detail extensive |
| Addresses, Flags | Information about the addresses configured on the logical interface. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |

**show interfaces
extensive (MLPPP on
Link Services IQ)**

```

user@host>show interfaces lsq-0/2/0 extensive
Physical interface: lsq-0/2/0, Enabled, Physical link is Up
  Interface index: 140, SNMP ifIndex: 25, Generation: 23
  Link-level type: LinkService, MTU: 1504
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Last flapped   : 2005-06-02 08:54:36 PDT (00:05:45 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :          8872424          229080 bps
    Output bytes :         9856960          234448 bps
    Input packets:          38202           117 pps
    Output packets:         39453           117 pps
  Frame exceptions:
    Oversized frames          0
    Errored input frames      0
    Input on disabled link/bundle 0
    Output for disabled link/bundle 0
    Queuing drops             0
  Buffering exceptions:
    Packet data buffer overflow 0
    Fragment data buffer overflow 0
  Assembly exceptions:
    Fragment timeout          0
    Missing sequence number    0
    Out-of-order sequence number 0
    Out-of-range sequence number 0
  Hardware errors (sticky):
    Data memory error          0
    Control memory error        0
  Queue counters:

```

| | Queued packets | Transmitted packets | Dropped packets |
|------|----------------|---------------------|-----------------|
| 0 be | 0 | 0 | 0 |
| 1 ef | 0 | 0 | 0 |
| 2 af | 0 | 0 | 0 |
| 3 nc | 0 | 0 | 0 |

```

Logical interface lsq-0/2/0.0 (Index 66) (SNMP ifIndex 26) (Generation 5)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Multilink-PPP
  Bandwidth: 256kbps
  Bundle options:
    MRRU          1504
    Drop timer period 2000
    Sequence number format long (24 bits)
    Fragmentation threshold 0
    Links needed to sustain bundle 1
    Multilink classes 0
    Link layer overhead 4.0 %
  Bundle status:
    Remote MRRU          1500
    Received sequence number 0x0
    Transmit sequence number 0x0
    Packet drops          0 (0 bytes)
    Fragment drops        9 (1401 bytes)
    MRRU exceeded         0
    Fragment timeout       0
    Missing sequence number 0
    Out-of-order sequence number 4

```



```

Out-of-range sequence number    0
Packet data buffer overflow      0
Fragment data buffer overflow    0
Statistics      Frames      fps      Bytes      bps
Bundle:
Fragments:
  Input :      79827      239      9593009      232288
  Output:      77533      234      9811743      238056
Packets:
  Input :      38202      117      8872424      229080
  Output:      39453      117      9856960      234448
Link:
ds-1/0/2:1:1.0 <-- up
  Input :      1114      87      180183      113608
  Output:      1577      118      199215      119064
ds-1/0/2:1:2.0 <-- down
  Input :      1941      152      187948      118680
  Output:      1574      116      199494      118992
Protocol inet, MTU: 1500 [Adjusted]
Flags: User-MTU, MTU-Protocol-Adjusted
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.74.11/24, Local: 10.74.11.10
Protocol iso, MTU: 1500 [Adjusted]
Flags: User-MTU, MTU-Protocol-Adjusted
Protocol mpls, MTU: 1488 [Adjusted]
Flags: User-MTU, MTU-Protocol-Adjusted

```

**show interfaces
extensive (MC-MLPPP
on Link Services IQ)**

```

user@host> show interfaces extensive lsq-0/2/0
Physical interface: lsq-0/2/0, Enabled, Physical link is Up
Interface index: 140, SNMP ifIndex: 25, Generation: 23
Link-level type: LinkService, MTU: 1504
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps
Last flapped   : 2005-06-02 08:54:36 PDT (00:02:25 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :      3474024      223704 bps
Output bytes :      4193992      233888 bps
Input packets:      15809      116 pps
Output packets:      16788      117 pps
Frame exceptions:
Oversized frames      0
Errored input frames   0
Input on disabled link/bundle 0
Output for disabled link/bundle 0
Queuing drops         0
Buffering exceptions:
Packet data buffer overflow 0
Fragment data buffer overflow 0
Assembly exceptions:
Fragment timeout      0
Missing sequence number 0
Out-of-order sequence number 0
Out-of-range sequence number 0
Hardware errors (sticky):
Data memory error     0
Control memory error   0
Queue counters:      Queued packets  Transmitted packets  Dropped packets

0 be      0      0      0

```

| | | | |
|------|---|---|---|
| 1 ef | 0 | 0 | 0 |
| 2 af | 0 | 0 | 0 |
| 3 nc | 0 | 0 | 0 |

Logical interface lsq-0/2/0.0 (Index 66) (SNMP ifIndex 26) (Generation 5)

Flags: Point-To-Point SNMP-Traps Encapsulation: Multilink-PPP

Bandwidth: 256kbps

Bundle options:

MRRU 1504
 Drop timer period 2000
 Sequence number format long (24 bits)
 Fragmentation threshold 0
 Links needed to sustain bundle 1
 Multilink classes 2
 Link layer overhead 4.0 %

Multilink class 0 status:

Received sequence number 0x4c38
 Transmit sequence number 0x4890
 Packet drops 0 (0 bytes)
 Fragment drops 2551 (397084 bytes)
 MRRU exceeded 0
 Fragment timeout 52
 Missing sequence number 0
 Out-of-order sequence number 953
 Out-of-range sequence number 0
 Packet data buffer overflow 0
 Fragment data buffer overflow 0

Multilink class 1 status:

Received sequence number 0xffffffff
 Transmit sequence number 0x3710
 Packet drops 0 (0 bytes)
 Fragment drops 0 (0 bytes)
 MRRU exceeded 0
 Fragment timeout 0
 Missing sequence number 0
 Out-of-order sequence number 0
 Out-of-range sequence number 0
 Packet data buffer overflow 0
 Fragment data buffer overflow 0

| Statistics | Frames | fps | Bytes | bps |
|------------|--------|-----|-------|-----|
|------------|--------|-----|-------|-----|

Bundle:

| | | | | |
|------------|-------|-----|---------|--------|
| Fragments: | | | | |
| Input : | 33719 | 239 | 4041763 | 231632 |
| Output: | 32371 | 234 | 4096545 | 237488 |
| Packets: | | | | |
| Input : | 15809 | 116 | 3474024 | 223704 |
| Output: | 16788 | 117 | 4193992 | 233888 |

Multilink class 0:

| | | | | |
|------------|-------|---|---|---|
| Fragments: | | | | |
| Input : | 19331 | 0 | 0 | 0 |
| Output: | 0 | 0 | 0 | 0 |
| Packets: | | | | |
| Input : | 2064 | 0 | 0 | 0 |
| Output: | 1864 | 0 | 0 | 0 |

Multilink class 1:

| | | | | |
|------------|-------|---|---|---|
| Fragments: | | | | |
| Input : | 0 | 0 | 0 | 0 |
| Output: | 14096 | 0 | 0 | 0 |
| Packets: | | | | |

```

      Input :      14096      0      0      0
      Output:      0      0      0      0
Link:
  ds-1/0/2:1:1.0, Enabled, Physical link is Up
      Input :      20972      151      2030595      118080
      Output:      16184      116      2048468      118488
  ds-1/0/2:1:2.0, Enabled, Physical link is Up
      Input :      12747      88      2011168      113552
      Output:      16187      118      2048077      119000
Protocol inet, MTU: 1500 [Adjusted], Generation: 14, Route table: 0
Flags: User-MTU, MTU-Protocol-Adjusted
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.0.1.0/30, Local: 10.0.1.2, Broadcast: Unspecified,
  Generation: 18

```

**show interfaces
extensive (MLPPP on
Link Services IQ Bundle)**

```

user@host> show interfaces lsq-7/1/0.0 extensive
Logical interface lsq-7/1/0.0 (Index 88) (SNMP ifIndex 114) (Generation 188)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: Multilink-FR
Last flapped: Never
Bandwidth: 256kbps
Bundle links information:
  Active bundle links      2
  Removed bundle links    0
  Disabled bundle links    0
Bundle options:
  MRRU                      1504
  Drop timer period        1500
  Inner PPP Protocol field compression enabled
  Sequence number format   short (12 bits)
  Fragmentation threshold  0
  Links needed to sustain bundle 1
  Multilink classes        0
  Link layer overhead      4.0 %
Bundle status:
  Received sequence number  0xb74
  Transmit sequence number  0xb74
  Packet drops              0 (0 bytes)
  Fragment drops            0 (0 bytes)
  MRRU exceeded            0
  Fragment timeout         0
  Missing sequence number   0
  Out-of-order sequence number 0
  Out-of-range sequence number 0
  Packet data buffer overflow 0
  Fragment data buffer overflow 0
Statistics      Frames      fps      Bytes      bps
Bundle:
  Multilink:
    Input :      315381      0      42757818      0
    Output:      315381      0      43388580      0
  Network:
    Input :      315381      0      40952064      0
    Output:      315381      0      40952064      0
Link:
  ds-6/0/0:1:1.0
    Up time: Up since boot
    Input :      63794      0      25146728      0
    Output:      63778      0      25273164      0
  ds-6/0/0:1:2.0
    Up time: Up since boot
    Input :      251587      0      17611090      0

```

```

        Output:          251603          0          18115416          0
Multilink detail statistics:
Bundle:
  Fragments:
    Input :              0              0              0              0
    Output:              0              0              0              0
  Non-fragments:
    Input :          293748              0          19387368              0
    Output:          293748              0          20562360              0
  LFI:
    Input :          21633              0          22152192              0
    Output:          21633              0          22325256              0
Protocol inet, MTU: 1500, Generation: 204, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.0.1.0/30, Local: 10.0.1.2, Broadcast:
Unspecified, Generation: 214

```

show interfaces (Multilink Services)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>ml-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index> <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified multilink services interface. |
| Options | <p><i>ml-fpc/pic/port</i>—Display standard status information about the specified multilink services interface.</p> <p><i>brief detail extensive terse</i>—(Optional) Display the specified level of output.</p> <p><i>descriptions</i>—(Optional) Display interface description strings.</p> <p><i>media</i>—(Optional) Display media-specific information about network interfaces.</p> <p><i>snmp-index</i>—(Optional) Display the SNMP index of interface.</p> <p><i>statistics</i>—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Multilink Services) on page 671 |
| Output Fields | Table 129 on page 665 lists the output fields for the show interfaces (Multilink Services) command. Output fields are listed in the approximate order in which they appear. |

Table 129: Multilink Services show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|--------------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Link-level type | Encapsulation being used on the physical interface: Multilink . | All levels |

Table 129: Multilink Services show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|--------------------------|
| MTU | MTU size on the physical interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router. | detail extensive |
| Frame exceptions | Information about framing exceptions. Includes events recorded under Exception Events for each logical interface: <ul style="list-style-type: none"> ■ Oversized frames—Number of frames received that exceed maximum frame length. Maximum length is 4500 Kb (kilobits). ■ Errored input frames—Number of input frame errors. ■ Input on disabled link/bundle—Number of frames received on disabled links. These can result either from an inconsistent configuration, or from a bundle or link being brought up or down with traffic actively flowing through it. ■ Output for disabled link/bundle—Number of frames sent for a disabled or unavailable link. These can result either from an inconsistent configuration, or from a bundle being brought up or down with traffic actively flowing through it. ■ Queuing drops—Total number of packets dropped before traffic enters the link services IQ interface. Indicates that the interface is becoming oversubscribed. | extensive |
| Buffering exceptions | Information about buffering exceptions. Includes events recorded under Exception Events for each logical interface. <ul style="list-style-type: none"> ■ Packet data buffer overflow—Packet buffer memory is full. This overflow can occur when the aggregate data rate exceeds the physical multilink services interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory is full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical multilink services interface capacity. Check the logical interface exception event counters to determine which bundle is responsible. | extensive |

Table 129: Multilink Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------|
| Assembly exceptions | <p>Information about assembly exceptions. Includes events recorded under Exception Events for each logical interface.</p> <p>An assembly exception does not necessarily indicate an operational problem with the Multilink PIC itself. If multilink-encapsulated traffic is dropped or reordered after a sequence number has been assigned, the assembling multilink interface records one or more exception events. The multilink interface can drop multilink-encapsulated fragments itself as a result. Any multilink packets or fragments dropped by the Multilink PIC itself result in packet or fragment drop counts on individual logical interfaces. If the logical interface drop counts are zero, but exception events are seen, the most likely cause is a problem with the individual link interfaces. Even if the logical interface fragment drop counts are nonzero, excess differential delay or traffic losses on individual interfaces can be the root cause.</p> <ul style="list-style-type: none"> ■ Fragment timeout—Drop-timer expired while a fragment sequence number was outstanding. Occurs only if drop-timer is enabled. This can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. These events do not necessarily indicate any problem with the operation of the Multilink PIC itself. If one or more individual links drop traffic, these events can occur. Check the logical interface exception event counters to determine which bundle is responsible. ■ Missing sequence number—A gap was detected in the sequence numbers of fragments on a bundle. These events do not necessarily indicate any problem with the operation of the Multilink PIC itself. If one or more individual links drop traffic, these events can occur. Check the logical interface exception event counters to determine which bundle is responsible. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the multilink interface unable to correctly process the resulting stream. Check the logical interface exception event counters to determine which bundle is responsible. ■ Out-of-range sequence number—Received frame with out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost, or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. Check the logical interface exception event counters to determine which bundle is responsible. | extensive |
| Hardware errors | <p>Information about hardware errors.</p> <ul style="list-style-type: none"> ■ Data memory error—A memory error was detected on the interface DRAM. Indicates possible hardware failure. Contact Juniper Networks technical support. ■ Control memory error—A memory error was detected on the interface DRAM. Indicates possible hardware failure. Contact Juniper Networks technical support. | extensive |
| Logical Interface | | |
| Logical interface | Logical interface name. | All levels |

Table 129: Multilink Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|----------------|---|--------------------------|
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP interface index number. | detail extensive none |
| Encapsulation | Encapsulation being used: PPP or Multilink PPP. | All levels |
| Bandwidth | Speed at which the interface is running. | All levels |
| Flags | Logical interface flags. Possible values are described in “Logical Interface Flags” on page 91. | detail extensive none |
| Bundle options | Information about configured bundle options: <ul style="list-style-type: none"> ■ MRRU—Configured size of the MRRU (maximum received reconstructed unit). It can be 1500 to 4500 bytes. ■ Drop timer period—Configured drop timeout period. It can be 0 through 127 ms. A value of 0 disables the timer. The default setting is 0. ■ Sequence number format—Configured size of the sequence header: 12 or 24 bits. The default is 24 bits. ■ Fragmentation threshold—Configured fragmentation threshold. A value of 0 results in no fragmentation. Nonzero values can be 128 through 16,320 bytes, in integer multiples of 64 bytes. The default is 0. ■ Links needed to sustain bundle—Minimum number of links to sustain the bundle: 1 through 8. | detail extensive none |

Table 129: Multilink Services show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|--|--------------------------|
| Bundle status (MLPPP) or Multilink class status (MC-MLPPP) | <p>Information about bundle status.</p> <ul style="list-style-type: none"> ■ Remote MRRU—MRRU value received from remote peer. If negotiation has not been initiated, the default value is displayed. ■ Received sequence number—Sequence number for received packets. ■ Transmitted sequence number—Sequence number for transmitted packets. ■ Packet drops—Number and byte count of output packets that were dropped, rather than being encapsulated and sent out of the router as fragments. The packet drop counter is incremented if there is a temporary shortage of packet memory on the AS PIC, which causes packet fragmentation to fail. ■ Fragment drops—Number and byte count of input fragments that were dropped, rather than being reassembled and handled by the router as packets. This counter also includes fragments that have been received successfully but had to be dropped because not all fragments that constituted a packet had been received. The fragment drop counter is incremented when a fragment received on constituent links is dropped. Drop fragments can be triggered by sequence ordering errors, duplicate fragments, timed-out fragments, and bad multilink headers. ■ MRRU exceeded—Number of reassembled packets exceeding the MRRU. This counter is not implemented in this release. ■ Fragment timeout—Drop timer expired while a fragment sequence number was outstanding. Occurs only if the drop timer is enabled. This timeout can occur if the differential delay across the links in a bundle exceeds the drop-timer setting, or if a multilink packet is lost in transit while the drop timer is enabled. ■ Missing sequence number—Gap detected in the sequence numbers of fragments on a bundle. ■ Out-of-order sequence number—Two frames with out-of-order sequence numbers within a single link. This event indicates that an individual link within a bundle reordered traffic, making the multilink interface unable to correctly process the resulting stream. ■ Out-of-range sequence number—Frame with an out-of-range sequence number. These events can occur when a large amount of multilink-encapsulated traffic is lost or the multilink peer is reset, so that a large jump in sequence numbers results. A small number of these events can occur when the far end of a bundle is taken down or brought up. ■ Packet data buffer overflow—Packet buffer memory full. This overflow can occur when the aggregate data rate exceeds the physical link services IQ interface capacity. ■ Fragment data buffer overflow—Fragment buffer memory full. This overflow can occur when excessive differential delay is experienced across the links within a single bundle, or when the aggregate data rate exceeds the physical link services IQ capacity. | detail extensive |
| Remote MRRU | MRRU value received from remote peer. If negotiation has not been initiated, the default value is displayed. | detail extensive none |

Table 129: Multilink Services show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|------------------|---|--------------------------|
| Bundle errors | <p>Information about bundle errors.</p> <ul style="list-style-type: none"> ■ Packet drops—Number and byte count of output packets dropped, rather than being encapsulated and sent out of the router as fragments. ■ Fragment drops—Number and byte count of input fragments dropped, rather than being reassembled and handled by the router as packets. ■ MRRU exceeded—Number of reassembled packets exceeding the MRRU. ■ Exception events—Number of exceptional events encountered while handling traffic on the bundle, other than MRRU exceeded errors. These events are categorized under the physical interface: Frame exceptions, Buffering exceptions, and Fragment exceptions. Exception events do not necessarily indicate that the multilink interface is not operating properly. Individual link failures can produce exceptional events. | detail extensive |
| Statistics | <p>Information about fragments and packets received and sent by the router. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router.</p> <ul style="list-style-type: none"> ■ Bundle—Information about bundles. ■ Link—Information about links used in the multilink operation. | detail extensive |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. If the MTU value is negotiated down to meet the MRRU requirement on the remote side, this value is marked Adjusted . | detail extensive none |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Route table in which this address exists. For example, Route table:0 refers to inet.0. | detail extensive |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

**show interfaces
extensive (Multilink
Services)**

```

user@host> show interfaces ml-0/3/0 extensive
Physical interface: ml-0/3/0, Enabled, Physical link is Up
Interface index: 273, SNMP ifIndex: 196, Generation: 535
Link-level type: Multilink, MTU: 4474
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Last flapped : 2002-04-25 14:21:34 PDT (21:06:59 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :                3535                0 bps
Output bytes :               4135                0 bps
Input packets:                 87                0 pps
Output packets:              103                0 pps
Frame exceptions:
Oversized frames              0
Errored input frames          0
Input on disabled link/bundle 0
Output for disabled link/bundle 0
Queuing drops                 0
Buffering exceptions:
Packet data buffer overflow    0
Fragment data buffer overflow  0
Assembly exceptions:
Fragment timeout              0
Missing sequence number        0
Out-of-order sequence number   0
Out-of-range sequence number   0
Hardware errors (sticky):
Data memory error             0
Control memory error           0

Logical interface ml-0/3/0.1 (Index 110) (SNMP ifIndex 674)
(Generation 402)
Flags: Point-To-Point SNMP-Traps Encapsulation: Multilink-PPP
Bandwidth: 12288kbps
Bundle options:
MRRU                          1524
Drop timer period             0
Sequence number format         long (24 bits)
Fragmentation threshold        0
Links needed to sustain bundle 1
Bundle status:
Remote MRRU                    1500
Received sequence number        0x19ec14
Transmit sequence number        0x38cfa8
Packet drops                    0 (0 bytes)
Fragment drops                  0 (0 bytes)
MRRU exceeded                   0
Fragment timeout                 0
Missing sequence number          0
Out-of-order sequence number     0
Out-of-range sequence number     0
Packet data buffer overflow      0
Fragment data buffer overflow    0
Bundle errors:
Packet drops                    0 (0 bytes)
Fragment drops                  0 (0 bytes)
MRRU exceeded                   0
Exception events                0
Statistics      Frames      fps      Bytes      bps
Bundle:

```

```

Fragments:
  Input :          5          0          450          0
  Output:          6          0          499          0
Packets:
  Input :          5          0          450          0
  Output:         12          0         1202          0
Link:
  t1-0/1/0:11.0
    Input :          1          0          90          0
    Output:          1          0          92          0
  t1-0/1/0:12.0
    Input :          1          0          90          0
    Output:          1          0          92          0
  t1-0/1/0:10.0
    Input :          1          0          90          0
    Output:          1          0          92          0
  t1-0/1/0:14.0
    Input :          1          0          90          0
    Output:          1          0          92          0
  t1-0/1/0:13.0
    Input :          1          0          90          0
    Output:          1          0          92          0
  t1-0/1/0:8.0
    Input :          0          0           0          0
    Output:          0          0           0          0
  t1-0/1/0:9.0
    Input :          0          0           0          0
    Output:          0          0           0          0
Protocol inet, MTU: 1500 [Adjusted], Flags: Generation: 752 Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary, MTU-Protocol-Adjusted
    Destination: 1.1.2.2, Local: 1.1.2.1, Broadcast: Unspecified,
    Generation: 1090
Protocol iso, MTU: 1500 [Adjusted], Flags: Is-Primary,
Generation: 753 Route table: 0

```

show interfaces (Redundant Link Services IQ)

| | |
|---|--|
| Syntax | <pre>show interfaces rlsqnumber <brief detail extensive terse> <descriptions> <media> <queue> <routing> <snmp-index snmp-index> <statistics></pre> |
| Release Information | Command introduced in JUNOS Release 7.6. |
| Description | (M-series and T-series routing platforms only) Display status information about the specified redundant link services intelligent queuing (IQ) configuration. |
| Options | <p>rlsqnumber—Redundant link services IQ interface name. The logical interface number range of values is 0 through 127.</p> <p>none—Display standard status information about the specified redundant link services IQ configuration.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>queue—(Optional) Display queue information about network interfaces.</p> <p>routing—(Optional) Display routing information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <pre>show interfaces (Redundant Link Services IQ) on page 673 show interfaces brief (Redundant Link Services IQ) on page 674 show interfaces detail (Redundant Link Services IQ) on page 674 show interfaces extensive (Redundant Link Services IQ) on page 676</pre> |
| Output Fields | Table 128 on page 651 lists the output fields for the show interfaces (redundant link services IQ) command. Output fields are listed in the approximate order in which they appear. |
| show interfaces (Redundant Link Services IQ) | <pre>user@host> show interfaces rlsq0 Physical interface: rlsq0, Enabled, Physical link is Up Interface index: 196, SNMP ifIndex: 27 Link-level type: LinkService, MTU: 1504 Device flags : Present Running</pre> |

```

Interface flags: SNMP-Traps Internal: 0x4000
Last flapped   : Never
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)

Logical interface rlsq0.0 (Index 72) (SNMP ifIndex 88)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: Multilink-PPP
Bandwidth: 0
Statistics      Frames      fps      Bytes      bps
Bundle:
Fragments:
  Input :           3          0        255          0
  Output:           3          0        264          0
Packets:
  Input :           3          0        252          0
  Output:           0          0         0           0
Link:
  t1-1/3/0:1.0
    Input :           3          0        255          0
    Output:           0          0         0           0
  t1-1/3/0:2.0
    Input :           0          0         0           0
    Output:           3          0        264          0
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
Protocol inet, MTU: 1500
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 2.2.2.0/30, Local: 2.2.2.1

```

show interfaces brief
(Redundant Link
Services IQ)

```

user@host> show interfaces rlsq0 brief
Physical interface: rlsq0, Enabled, Physical link is Up
Link-level type: LinkService, MTU: 1504
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000

Logical interface rlsq0.0
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: Multilink-PPP
inet 2.2.2.1/30

```

show interfaces detail
(Redundant Link
Services IQ)

```

user@host> show interfaces rlsq0 detail
Physical interface: rlsq0, Enabled, Physical link is Up
Interface index: 196, SNMP ifIndex: 27, Generation: 144
Link-level type: LinkService, MTU: 1504
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Last flapped   : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :           252          0 bps
  Output bytes:           276          0 bps
  Input packets:           3          0 pps
  Output packets:          3          0 pps
Frame exceptions:
  Oversized frames           0
  Errored input frames        0
  Input on disabled link/bundle 0
  Output for disabled link/bundle 0
  Queuing drops              0
Buffering exceptions:
  Packet data buffer overflow 0

```

```

    Fragment data buffer overflow      0
Assembly exceptions:
    Fragment timeout                  0
    Missing sequence number           0
    Out-of-order sequence number      0
    Out-of-range sequence number      0
Hardware errors (sticky):
    Data memory error                 0
    Control memory error              0
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets  Dropped packets

    0 be                      0                0                0
    1 expedited-fo           0                0                0
    2 assured-forw           0                0                0
    3 network-cont           0                0                0

```

Logical interface rlsq0.0 (Index 72) (SNMP ifIndex 88) (Generation 31)

Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: Multilink-PPP

Bandwidth: 0

Bundle options:

```

    MRRU                          1504
    Remote MRRU                   N/A
    Drop timer period             2000
    Sequence number format        long (24 bits)
    Fragmentation threshold       0
    Links needed to sustain bundle 1
    Multilink classes             0
    Link layer overhead           4.0 %

```

Bundle status:

```

    Received sequence number      0xffffffff
    Transmit sequence number      0x0
    Packet drops                  0 (0 bytes)
    Fragment drops                0 (0 bytes)
    MRRU exceeded                 0
    Fragment timeout              0
    Missing sequence number       0
    Out-of-order sequence number  0
    Out-of-range sequence number  0
    Packet data buffer overflow    0
    Fragment data buffer overflow  0

```

| Statistics | Frames | fps | Bytes | bps |
|------------|--------|-----|-------|-----|
|------------|--------|-----|-------|-----|

Bundle:

Fragments:

| | | | | |
|---------|---|---|-----|---|
| Input : | 3 | 0 | 255 | 0 |
| Output: | 3 | 0 | 264 | 0 |

Packets:

| | | | | |
|---------|---|---|-----|---|
| Input : | 3 | 0 | 252 | 0 |
| Output: | 0 | 0 | 0 | 0 |

Link:

t1-1/3/0:1.0

| | | | | |
|---------|---|---|-----|---|
| Input : | 3 | 0 | 255 | 0 |
| Output: | 0 | 0 | 0 | 0 |

t1-1/3/0:2.0

| | | | | |
|---------|---|---|-----|---|
| Input : | 0 | 0 | 0 | 0 |
| Output: | 3 | 0 | 264 | 0 |

NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:

```
Not-configured
Protocol inet, MTU: 1500, Generation: 43, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 2.2.2.0/30, Local: 2.2.2.1, Broadcast: Unspecified,
Generation: 45
```

**show interfaces
extensive (Redundant
Link Services IQ)** The output for the `show interfaces rlsq extensive` command is identical to that for the `show interfaces rlsq detail` command. For sample output, see `show interfaces detail (Redundant Link Services IQ)` on page 674.

Chapter 23

Tunnel Services Interface Operational Mode Commands

Table 130 on page 677 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot tunnel services interfaces. Commands are listed in alphabetical order.

Table 130: Tunnel Interface Operational Mode Commands

| Task | Command |
|---|---|
| Display status information about generic routing encapsulation (GRE) interfaces. | show interfaces (GRE) |
| Display status information about IP-over-IP interfaces. | show interfaces (IP-over-IP) |
| Display status information about logical tunnel interfaces. | show interfaces (Logical Tunnel) |
| Display status information about IP multicast encapsulation and de-encapsulation tunnel interfaces. | show interfaces (Multicast Tunnel) |
| Display status information about Protocol Independent Multicast (PIM) de-encapsulation and encapsulation tunnel interfaces. | show interfaces (PIM) |
| Display status information about virtual loopback tunnel interfaces. | show interfaces (Virtual Loopback Tunnel) |

show interfaces (GRE)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified generic routing encapsulation (GRE) interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the interface type is <i>gr-fpc/pic/port</i>. On the J-series routing platform, the interface type is <i>gr-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display brief interface information.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (GRE) on page 682</p> <p>show interfaces brief (GRE) on page 682</p> <p>show interfaces detail (GRE) on page 682</p> <p>show interfaces extensive (GRE) on page 683</p> |
| Output Fields | Table 131 on page 678 lists the output fields for the show interfaces (GRE) command. Output fields are listed in the approximate order in which they appear. |

Table 131: GRE show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 131: GRE show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|--|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Device Flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface Flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| Flags | <p>Information about the logical interface. Possible values listed in “Logical Interface Flags” on page 91 describe general information about the logical interface.</p> <p>GRE-specific information about the logical interface is indicated by the presence or absence of the following value in this field:</p> <ul style="list-style-type: none"> ■ Reassemble-Pkts—If the Flags field includes this string, the GRE tunnel is configured to reassemble tunnel packets that were fragmented after tunnel encapsulation. | All levels |

Table 131: GRE show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------------|--|-----------------------|
| IP-Header | <p>IP header of the logical interface. If the tunnel key statement is configured, this information is included in the IP Header entry.</p> <p>GRE-specific information about the logical interface is indicated by the presence or absence of the following value in this field:</p> <ul style="list-style-type: none"> ■ df—If the IP-Header field includes this string immediately following the 16 bits of identification information (that is, if :df: displays after the twelfth byte), the GRE tunnel is configured to allow fragmentation of GRE packets after encapsulation. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input rate—Rate of bits and packets received on the interface. ■ Output rate—Rate of bits and packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive none |
| Protocol | Protocol family configured on the logical interface, such as iso , inet6 , or mpls . | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is inet , the IP address of the interface is also displayed. | brief |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0 . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |

Table 131: GRE show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|------------|---|-----------------------|
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces (GRE) user@host> show interfaces gr-1/2/0
Physical interface: gr-0/0/0, Enabled, Physical link is Up
  Interface index: 132, SNMP ifIndex: 26
  Type: GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)

Logical interface gr-0/0/0.0 (Index 68) (SNMP ifIndex 47)
  Flags: Point-To-Point SNMP-Traps 16384
  IP-Header 1.1.1.2:1.1.1.1:47:df:64:0000000000000000 Encapsulation: GRE=NULL
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 1476
  Flags: None
  Addresses, Flags: Is-Primary
  Local: 1.10.1.1

show interfaces brief (GRE) user@host> show interfaces gr-1/2/0 brief
Physical interface: gr-1/2/0, Enabled, Physical link is Up
  Type: GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps

Logical interface gr-1/2/0.0
  Flags: Hardware-Down Point-To-Point SNMP-Traps 0x4000
  IP-Header 10.10.0.2:10.10.0.1:47:df:64:0000000000000000
  Encapsulation: GRE=NULL
  inet 10.100.0.1/30
  mpls

show interfaces detail (GRE) user@host> show interfaces gr-1/2/0 detail
Physical interface: gr-0/0/0, Enabled, Physical link is Up
  Interface index: 132, SNMP ifIndex: 26, Generation: 13
  Type: GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Hold-times     : Up 0 ms, Down 0 ms
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 0 0 bps
    Output bytes : 0 0 bps
    Input packets: 0 0 pps
    Output packets: 0 0 pps

Logical interface gr-0/0/0.0 (Index 68) (SNMP ifIndex 47) (Generation 8)
  Flags: Point-To-Point SNMP-Traps 16384
  IP-Header 1.1.1.2:1.1.1.1:47:df:64:0000000000000000 Encapsulation: GRE=NULL
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
  Local statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
  Transit statistics:
    Input bytes : 0 0 bps

```

```

Output bytes :          0          0 bps
Input  packets:          0          0 pps
Output packets:          0          0 pps
Protocol inet, MTU: 1476, Generation: 12, Route table: 0
Flags: None
Addresses, Flags: Is-Primary
  Destination: Unspecified, Local: 1.10.1.1, Broadcast: Unspecified,
  Generation: 15

```

show interfaces extensive (GRE) The output for the `show interfaces extensive` command is identical to that for the `show interfaces detail` command. For sample output, see `show interfaces detail (GRE)` on page 682.

show interfaces (IP-over-IP)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified IP-over-IP interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the interface type is <i>ip-fpc/pic/port</i>. On the J-series routing platform, the interface type is <i>ip-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (IP-over-IP) on page 686</p> <p>show interfaces brief (IP-over-IP) on page 687</p> <p>show interfaces detail (IP-over-IP) on page 687</p> <p>show interfaces extensive (IP-over-IP) on page 687</p> |
| Output Fields | Table 132 on page 684 lists the output fields for the show interfaces (IP-over-IP) command. Output fields are listed in the approximate order in which they appear. |

Table 132: IP-over-IP show interfaces Output Fields

| Field | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 132: IP-over-IP show interfaces Output Fields *(continued)*

| Field | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Input rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| IP Header | IP header of the logical interface. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |

Table 132: IP-over-IP show interfaces Output Fields (*continued*)

| Field | Field Description | Level of Output |
|------------------------|---|-----------------------|
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. <ul style="list-style-type: none"> ■ Input rate—Rate of bits and packets received on the interface. ■ Output rate—Rate of bits and packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as <code>iso</code> , <code>inet6</code> , or <code>mpls</code> . | detail extensive none |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <code>inet</code> , the IP address of the interface is also displayed. | brief |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table <code>inet.0</code> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |

```

show interfaces      user@host> show interfaces ip-0/0/0
(IP-over-IP)        Physical interface: ip-0/0/0, Enabled, Physical link is Up
                        Interface index: 133, SNMP ifIndex: 27
                        Type: IPIP, Link-level type: IP-over-IP, MTU: Unlimited, Speed: 800mbps
                        Device flags   : Present Running
                        Interface flags: SNMP-Traps
                        Input rate      : 0 bps (0 pps)
                        Output rate     : 0 bps (0 pps)

                        Logical interface ip-0/0/0.0 (Index 69) (SNMP ifIndex 49)
                        Flags: Point-To-Point SNMP-Traps 16384
                        IP-Header 2.2.2.1:2.2.2.2:4:df:64:00000000 Encapsulation: IPv4-NUL
                        Input packets : 0
                        Output packets: 0
                        Protocol inet, MTU: 1480
                        Flags: None

```

```

show interfaces brief      user@host> show interfaces ip-0/0/0 brief
(IP-over-IP)             Physical interface: ip-0/0/0, Enabled, Physical link is Up
                             Type: IPIP, Link-level type: IP-over-IP, MTU: Unlimited, Speed: 800mbps
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps

                             Logical interface ip-0/0/0.0
                             Flags: Point-To-Point SNMP-Traps 16384
                             IP-Header 2.2.2.1:2.2.2.2:4:df:64:00000000 Encapsulation: IPv4=NULL
                             inet

```

```

show interfaces detail   user@host> show interfaces ip-0/0/0 detail
(IP-over-IP)             Physical interface: ip-0/0/0, Enabled, Physical link is Up
                             Interface index: 133, SNMP ifIndex: 27, Generation: 14
                             Type: IPIP, Link-level type: IP-over-IP, MTU: Unlimited, Speed: 800mbps
                             Hold-times      : Up 0 ms, Down 0 ms
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps
                             Statistics last cleared: Never
                             Traffic statistics:
                             Input bytes   :                0                0 bps
                             Output bytes  :                0                0 bps
                             Input packets:                0                0 pps
                             Output packets:                0                0 pps

                             Logical interface ip-0/0/0.0 (Index 69) (SNMP ifIndex 49) (Generation 9)
                             Flags: Point-To-Point SNMP-Traps 16384
                             IP-Header 2.2.2.1:2.2.2.2:4:df:64:00000000 Encapsulation: IPv4=NULL
                             Traffic statistics:
                             Input bytes   :                0
                             Output bytes  :                0
                             Input packets:                0
                             Output packets:                0
                             Local statistics:
                             Input bytes   :                0
                             Output bytes  :                0
                             Input packets:                0
                             Output packets:                0
                             Transit statistics:
                             Input bytes   :                0                0 bps
                             Output bytes  :                0                0 bps
                             Input packets:                0                0 pps
                             Output packets:                0                0 pps
                             Protocol inet, MTU: 1480, Generation: 13, Route table: 0
                             Flags: None

```

show interfaces extensive (IP-over-IP) The output for the show interfaces extensive command is identical to that for the show interfaces detail command. For sample output, see show interfaces detail (IP-over-IP) on page 687.

show interfaces (Logical Tunnel)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified logical tunnel interface. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the interface type is <i>lt-fpc/pic/port</i>. On the J-series routing platform, the interface type is <i>lt-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | show interfaces extensive (Logical Tunnel) on page 692 |
| Output Fields | Table 133 on page 688 lists the output fields for the show interfaces (logical tunnel) command. Output fields are listed in the approximate order in which they appear. |

Table 133: Logical Tunnel show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. Software-Pseudo indicates a standard software interface with no associated hardware device. | All levels |

Table 133: Logical Tunnel show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source: Internal or External when configured. Otherwise, Unspecified . | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Type of link. | All levels |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Physical info | Information about the physical interface. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | Hardware MAC address. | detail extensive none |
| Alternate link address | Backup link address. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 133: Logical Tunnel show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |

Table 133: Logical Tunnel show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes—Rate of bytes received on the interface. ■ Output bytes—Rate of bytes transmitted on the interface. ■ Input packets—Rate of packets received on the interface. ■ Output packets—Rate of packets transmitted on the interface. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface, such as <code>iso</code> , <code>inet6</code> , <code>mpls</code> . | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Route table in which this address exists. For example, <code>Route table:0</code> refers to <code>inet.0</code> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address of the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

**show interfaces
extensive (Logical
Tunnel)**

```

user@host> show interfaces lt-1/0/0 extensive
Physical interface: lt-1/0/0, Enabled, Physical link is Up
  Interface index: 143, SNMP ifIndex: 70, Generation: 26
  Type: Logical-tunnel, Link-level type: Logical-tunnel, MTU: 0,
  Clocking: Unspecified, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link type      : Unspecified
  Link flags     : None
  Physical info  : 13
  Hold-times    : Up 0 ms, Down 0 ms
  Current address: 00:90:69:a6:48:7e, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped   : 2004-03-03 15:53:52 PST (22:08:46 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :                0                0 bps
    Output bytes  :                0                0 bps
    Input packets :                0                0 pps
    Output packets:                0                0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 0
  Output errors:
    Carrier transitions: 1, Errors: 0, Drops: 0, MTU errors: 0

Logical interface lt-1/0/0.0 (Index 66) (SNMP ifIndex 467) (Generation 3024)
  Flags: Point-To-Point SNMP-Traps 16384 DLCI 100 Encapsulation: FR-NLPID
  Traffic statistics:
    Input bytes   :                0
    Output bytes  :                0
    Input packets :                0
    Output packets:                0
  Local statistics:
    Input bytes   :                0
    Output bytes  :                0
    Input packets :                0
    Output packets:                0
  Transit statistics:
    Input bytes   :                0                0 bps
    Output bytes  :                0                0 bps
    Input packets :                0                0 pps
    Output packets:                0                0 pps
  Protocol inet, MTU: 4470, Generation: 7034, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.1.1/24, Local: 10.1.1.1, Broadcast: Unspecified,
    Generation: 2054

```


show interfaces (Multicast Tunnel)

Syntax show interfaces *interface-type*
 <brief | detail | extensive | terse>
 <descriptions>
 <media>
 <snmp-index *snmp-index*>
 <statistics>

Release Information Command introduced before JUNOS Release 7.4.

Description Display status information about the specified multicast tunnel interface and its logical encapsulation and de-encapsulation interfaces.

Options *interface-type*—On M-series and T-series routing platforms, the interface type is *mt-fpc/pic/port*. On the J-series routing platform, the interface type is *mt-pim/0/port*.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index *snmp-index*—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Additional Information The multicast tunnel interface has two logical interfaces: encapsulation and de-encapsulation. These interfaces are automatically created by the JUNOS software for every multicast-enabled VPN routing and forwarding (VRF) instance. The encapsulation interface carries multicast traffic traveling from the edge interface to the core interface. The de-encapsulation interface carries traffic coming from the core interface to the edge interface.

Required Privilege Level view

List of Sample Output show interfaces (Multicast Tunnel) on page 695
 show interfaces brief (Multicast Tunnel) on page 695
 show interfaces detail (Multicast Tunnel) on page 695
 show interfaces extensive (Multicast Tunnel) on page 695
 show interfaces (Multicast Tunnel Encapsulation) on page 695
 show interfaces (Multicast Tunnel De-Encapsulation) on page 695

Output Fields Table 134 on page 694 lists the output fields for the `show interfaces` (Multicast Tunnel) command. Output fields are listed in the approximate order in which they appear.

Table 134: Multicast Tunnel show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | All levels |

show interfaces
(Multicast Tunnel)

```
user@host> show interfaces mt-1/2/0
Physical interface: mt-1/2/0, Enabled, Physical link is Up
  Interface index: 145, SNMP ifIndex: 41
  Type: Multicast-GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
```

show interfaces brief
(Multicast Tunnel)

```
user@host> show interfaces mt-1/2/0 brief
Physical interface: mt-1/2/0, Enabled, Physical link is Up
  Type: Multicast-GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
```

show interfaces detail
(Multicast Tunnel)

```
user@host> show interfaces mt-1/2/0 detail
Physical interface: mt-1/2/0, Enabled, Physical link is Up
  Interface index: 145, SNMP ifIndex: 41, Generation: 28
  Type: Multicast-GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Hold-times     : Up 0 ms, Down 0 ms
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :                      0          0 bps
    Output bytes  :                      0          0 bps
    Input packets :                      0          0 pps
    Output packets:                      0          0 pps
```

show interfaces extensive
(Multicast Tunnel)

```
user@host> show interfaces mt-1/2/0 extensive
Physical interface: mt-1/2/0, Enabled, Physical link is Up
  Interface index: 145, SNMP ifIndex: 41, Generation: 28
  Type: Multicast-GRE, Link-level type: GRE, MTU: Unlimited, Speed: 800mbps
  Hold-times     : Up 0 ms, Down 0 ms
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :                      0          0 bps
    Output bytes  :                      0          0 bps
    Input packets :                      0          0 pps
    Output packets:                      0          0 pps
```

show interfaces
(Multicast Tunnel Encapsulation)

```
user@host> show interfaces mt-3/1/0.32768
Logical interface mt-3/1/0.32768 (Index 67) (SNMP ifIndex 0)
  Flags: Point-To-Point SNMP-Traps 0x4000
  IP-Header 239.1.1.1:10.255.70.15:47:df:64:0000000800000000
  Encapsulation: GRE-NULL
  Input packets : 0
  Output packets: 2
  Protocol inet, MTU: Unlimited
  Flags: None
```

show interfaces
(Multicast Tunnel De-Encapsulation)

```
user@host> show interfaces mt-3/1/0.49152
Logical interface mt-3/1/0.49152 (Index 74) (SNMP ifIndex 0)
  Flags: Point-To-Point SNMP-Traps 0x6000 Encapsulation: GRE-NULL
  Input packets : 0
  Output packets: 2
  Protocol inet, MTU: Unlimited
  Flags: None
```

show interfaces (PIM)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>interface-type</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified Protocol Independent Multicast (PIM) de-encapsulation or PIM encapsulation interface, respectively. |
| Options | <p><i>interface-type</i>—On M-series and T-series routing platforms, the PIM de-encapsulation interface type is <i>pd-fpc/pic/port</i>. On the J-series routing platform, it is <i>pd-pim/0/port</i>. On M-series and T-series routing platforms, the PIM encapsulation interface type is <i>pe-fpc/pic/port</i>. On the J-series routing platform, it is <i>pe-pim/0/port</i>.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (PIM De-Encapsulation) on page 697</p> <p>show interfaces brief (PIM De-Encapsulation) on page 698</p> <p>show interfaces detail (PIM De-Encapsulation) on page 698</p> <p>show interfaces extensive (PIM Encapsulation) on page 698</p> <p>show interfaces (PIM Encapsulation) on page 698</p> <p>show interfaces brief (PIM Encapsulation) on page 698</p> <p>show interfaces detail (PIM Encapsulation) on page 698</p> <p>show interfaces extensive (PIM Encapsulation) on page 699</p> |
| Output Fields | Table 135 on page 696 lists the output fields for the show interfaces (PIM de-encapsulation or encapsulation) command. Output fields are listed in the approximate order in which they appear. |

Table 135: PIM show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|-------------------|-----------------|
| Physical Interface | | |

Table 135: PIM show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

```

show interfaces      user@host> show interfaces pd-0/0/0
(PIM De-Encapsulation) Physical interface: pd-0/0/0, Enabled, Physical link is Up
                          Interface index: 130, SNMP ifIndex: 25
                          Type: PIMD, Link-level type: PIM-Decapsulator, MTU: Unlimited, Speed: 800mbps
                          Device flags   : Present Running
                          Interface flags: SNMP-Traps
                          Input rate     : 0 bps (0 pps)
                          Output rate    : 0 bps (0 pps)

```

```

show interfaces brief      user@host> show interfaces pd-0/0/0 brief
(PIM De-Encapsulation)    Physical interface: pd-0/0/0, Enabled, Physical link is Up
                           Type: PIMD, Link-level type: PIM-Decapsulator, MTU: Unlimited, Speed: 800mbps
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps

show interfaces detail    user@host> show interfaces pd-0/0/0 detail
(PIM De-Encapsulation)    Physical interface: pd-0/0/0, Enabled, Physical link is Up
                           Interface index: 130, SNMP ifIndex: 25, Generation: 11
                           Type: PIMD, Link-level type: PIM-Decapsulator, MTU: Unlimited, Speed: 800mbps
                           Hold-times     : Up 0 ms, Down 0 ms
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps
                           Statistics last cleared: Never
                           Traffic statistics:
                           Input  bytes :                0                0 bps
                           Output bytes :                0                0 bps
                           Input  packets:                0                0 pps
                           Output packets:                0                0 pps

show interfaces           user@host> show interfaces pd-0/0/0 extensive
extensive (PIM           Physical interface: pd-0/0/0, Enabled, Physical link is Up
Encapsulation)         Interface index: 130, SNMP ifIndex: 25, Generation: 11
                           Type: PIMD, Link-level type: PIM-Decapsulator, MTU: Unlimited, Speed: 800mbps
                           Hold-times     : Up 0 ms, Down 0 ms
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps
                           Statistics last cleared: Never
                           Traffic statistics:
                           Input  bytes :                0                0 bps
                           Output bytes :                0                0 bps
                           Input  packets:                0                0 pps
                           Output packets:                0                0 pps

show interfaces           user@host> show interfaces pe-0/0/0
(PIM Encapsulation)       Physical interface: pe-0/0/0, Enabled, Physical link is Up
                           Interface index: 131, SNMP ifIndex: 26
                           Type: PIME, Link-level type: PIM-Encapsulator, MTU: Unlimited, Speed: 800mbps
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps
                           Input rate    : 0 bps (0 pps)
                           Output rate   : 0 bps (0 pps)

show interfaces brief    user@host> show interfaces pe-0/0/0 brief
(PIM Encapsulation)       Physical interface: pe-0/0/0, Enabled, Physical link is Up
                           Type: PIME, Link-level type: PIM-Encapsulator, MTU: Unlimited, Speed: 800mbps
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps

show interfaces detail    user@host> show interfaces pe-0/0/0 detail
(PIM Encapsulation)       Physical interface: pe-0/0/0, Enabled, Physical link is Up
                           Interface index: 131, SNMP ifIndex: 26, Generation: 12
                           Type: PIME, Link-level type: PIM-Encapsulator, MTU: Unlimited, Speed: 800mbps
                           Hold-times     : Up 0 ms, Down 0 ms
                           Device flags   : Present Running
                           Interface flags: SNMP-Traps
                           Statistics last cleared: Never
                           Traffic statistics:
                           Input  bytes :                0                0 bps
                           Output bytes :                0                0 bps

```

```

Input  packets:          0          0 pps
Output packets:          0          0 pps

```

```

show interfaces      user@host> show interfaces pe-0/0/0 extensive
extensive           Physical interface: pe-0/0/0, Enabled, Physical link is Up
(PIM Encapsulation) Interface index: 131, SNMP ifIndex: 26, Generation: 12
                        Type: PIME, Link-level type: PIM-Encapsulator, MTU: Unlimited, Speed: 800mbps
                        Hold-times      : Up 0 ms, Down 0 ms
                        Device flags    : Present Running
                        Interface flags: SNMP-Traps
                        Statistics last cleared: Never
                        Traffic statistics:
                        Input  bytes  :          0          0 bps
                        Output bytes  :          0          0 bps
                        Input  packets:          0          0 pps
                        Output packets:          0          0 pps

```

show interfaces (Virtual Loopback Tunnel)

| | |
|---------------------------------|--|
| Syntax | show interfaces <i>vt-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified virtual loopback tunnel interface. |
| Options | <p><i>vt-fpc/pic/port</i>—Display standard information about the specified virtual loopback tunnel interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (Virtual Loopback Tunnel) on page 702</p> <p>show interfaces brief (Virtual Loopback Tunnel) on page 702</p> <p>show interfaces detail (Virtual Loopback Tunnel) on page 703</p> <p>show interfaces extensive (Virtual Loopback Tunnel) on page 703</p> |
| Output Fields | Table 136 on page 700 lists the output fields for the show interfaces (virtual loopback tunnel) command. Output fields are listed in the approximate order in which they appear. |

Table 136: Virtual Loopback Tunnel show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |

Table 136: Virtual Loopback Tunnel show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed at which the interface is running. | All levels |
| Hold-times | Current interface hold-time up and hold-time down, in milliseconds. | detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |
| Bandwidth | Bandwidth allotted to the logical interface, in kilobytes per second. | All levels |

Table 136: Virtual Loopback Tunnel show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface. ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface. ■ Output packets—Number of packets transmitted on the interface. | detail extensive |
| Transit statistics | Statistics for traffic transiting the router. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| protocol-family | Protocol family configured on the logical interface. Possible values are described in “Family Flags” on page 89. | brief |
| Protocol | Protocol family configured on the logical interface. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| MTU | Maximum transmission unit size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |
| Flags | Information about protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |

```

show interfaces (Virtual Loopback Tunnel) user@host> show interfaces vt-1/2/0
Physical interface: vt-1/2/0, Enabled, Physical link is Up
Interface index: 144, SNMP ifIndex: 40
Type: Loopback, Link-level type: Virtual-loopback-tunnel, MTU: Unlimited,
Speed: 800mbps
Device flags : Present Running
Input rate   : 0 bps (0 pps)
Output rate  : 0 bps (0 pps)

Logical interface vt-1/2/0.0 (Index 76) (SNMP ifIndex 57)
Flags: Point-To-Point 16384 Encapsulation: Virtual-loopback-tunnel
Input packets : 0
Output packets: 0
Protocol inet, MTU: Unlimited
Flags: None
Protocol mpls, MTU: Unlimited
Flags: None

show interfaces brief (Virtual Loopback Tunnel) user@host> show interfaces vt-1/2/0 brief
Physical interface: vt-1/2/0, Enabled, Physical link is Up
Type: Loopback, Link-level type: Virtual-loopback-tunnel, MTU: Unlimited,
Speed: 800mbps

```

Device flags : Present Running

Logical interface vt-1/2/0.0

Flags: Point-To-Point 16384 Encapsulation: Virtual-loopback-tunnel
inet
mpls

**show interfaces detail
(Virtual Loopback
Tunnel)**

user@host> **show interfaces vt-1/2/0 detail**

Physical interface: vt-1/2/0, Enabled, Physical link is Up

Interface index: 144, SNMP ifIndex: 40, Generation: 27

Type: Loopback, Link-level type: Virtual-loopback-tunnel, MTU: Unlimited,
Speed: 800mbps

Hold-times : Up 0 ms, Down 0 ms

Device flags : Present Running

Statistics last cleared: Never

Traffic statistics:

| | | |
|-----------------|---|-------|
| Input bytes : | 0 | 0 bps |
| Output bytes : | 0 | 0 bps |
| Input packets: | 0 | 0 pps |
| Output packets: | 0 | 0 pps |

Logical interface vt-1/2/0.0 (Index 76) (SNMP ifIndex 57) (Generation 17)

Flags: Point-To-Point 16384 Encapsulation: Virtual-loopback-tunnel

Traffic statistics:

| | |
|-----------------|---|
| Input bytes : | 0 |
| Output bytes : | 0 |
| Input packets: | 0 |
| Output packets: | 0 |

Transit statistics:

| | | |
|-----------------|---|-------|
| Input bytes : | 0 | 0 bps |
| Output bytes : | 0 | 0 bps |
| Input packets: | 0 | 0 pps |
| Output packets: | 0 | 0 pps |

Protocol inet, MTU: Unlimited, Generation: 33, Route table: 0

Flags: None

Protocol mpls, MTU: Unlimited, Generation: 34, Route table: 0

Flags: None

**show interfaces
extensive (Virtual
Loopback Tunnel)**

user@host> **show interfaces vt-1/2/0 extensive**

Physical interface: vt-1/2/0, Enabled, Physical link is Up

Interface index: 144, SNMP ifIndex: 40, Generation: 27

Type: Loopback, Link-level type: Virtual-loopback-tunnel, MTU: Unlimited,
Speed: 800mbps

Hold-times : Up 0 ms, Down 0 ms

Device flags : Present Running

Statistics last cleared: Never

Traffic statistics:

| | | |
|-----------------|---|-------|
| Input bytes : | 0 | 0 bps |
| Output bytes : | 0 | 0 bps |
| Input packets: | 0 | 0 pps |
| Output packets: | 0 | 0 pps |

Logical interface vt-1/2/0.0 (Index 76) (SNMP ifIndex 57) (Generation 17)

Flags: Point-To-Point 16384 Encapsulation: Virtual-loopback-tunnel

Traffic statistics:

| | |
|-----------------|---|
| Input bytes : | 0 |
| Output bytes : | 0 |
| Input packets: | 0 |
| Output packets: | 0 |

Transit statistics:

| | | |
|---------------|---|-------|
| Input bytes : | 0 | 0 bps |
|---------------|---|-------|

```
Output bytes :          0          0 bps
Input  packets:          0          0 pps
Output packets:          0          0 pps
Protocol inet, MTU: Unlimited, Generation: 33, Route table: 0
  Flags: None
Protocol mpls, MTU: Unlimited, Generation: 34, Route table: 0
  Flags: None
```

Chapter 24

VoIP Interface Operational Mode Commands

Table 137 on page 705 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot the Avaya TGM550 VoIP module on J2320, J2350, J4350, and J6350 Services Routers. You can also monitor the Telephony Interfaces Modules (TIMs) to a limited extent. Commands are listed in alphabetical order.

Table 137: VoIP Interface Operational Mode Commands

| Task | Command |
|---|---|
| Remove the Media Gateway Controller (MGC) list configured on the TGM550 module. | <code>clear tgm fpc</code> |
| Provide a method for user authentication on the TGM550 modules. | <code>request tgm login fpc</code> |
| Configure the MGC list on the TGM550 module. | <code>set tgm fpc</code> |
| Display status information about TGM550 modules. | <code>show interfaces (TGM550 Module)</code> |
| Display dynamic call admission control (CAC) information. | <code>show tgm dynamic-call-admission-control</code> |
| Display information about TGM550 module connectivity and digital signal processor (DSP) capacity. | <code>show tgm fpc</code> |
| Display online and offline status of Avaya VoIP Telephony Interface Modules (TIMs). | <code>show tgm telephony-interface-module status</code> |

clear tgm fpc

| | |
|---------------------------------|---|
| Syntax | clear tgm fpc <i>slot-number</i> media-gateway-controller |
| Release Information | Command introduced in JUNOS Release 8.2. |
| Description | (J4350 and J6350 routing platforms only) Remove the IP addresses of the Media Gateway Controllers (MGCs) configured in the MGC list for the TGM550 VoIP module. |
| Options | <i>slot-number</i> —FPC slot number in which the TGM550 VoIP module is installed. media-gateway-controller—Remove the MGC list configuration for the TGM550 VoIP module. |
| Required Privilege Level | maintenance |
| Related Topics | set tgm fpc show tgm fpc |
| List of Sample Output | clear tgm fpc on page 706 |
| clear tgm fpc | user@host> clear tgm fpc 2 media-gateway-controller |

request tgm login fpc

| | |
|---------------------------------|--|
| Syntax | <code>request tgm login fpc <i>slot-number</i> user <i>tgm-user</i></code> |
| Release Information | Command introduced in JUNOS Release 8.5. |
| Description | (J2320, J2340, J4350, and J6350 J-series routing platforms only) Provide a self-authenticating method for the user to log in to the TGM550 VoIP module by means of passwords and keys. |
| Options | <i>slot-number</i> —Number of the slot in which the TGM550 VoIP module is installed. <i>tgm-user</i> —Username on the TGM550 VoIP module. |
| Required Privilege Level | maintenance |
| Related Topics | show tgm fpc |
| List of Sample Output | request tgm login fpc on page 707 |
| request tgm login fpc | <code>user@host> request tgm login fpc 2 user jnpr</code> |

set tgm fpc

| | |
|---------------------------------|---|
| Syntax | set tgm fpc <i>slot-number</i> media-gateway-controller [<i>ipaddress1 ipaddress2 ipaddress3 ipaddress4</i>] |
| Release Information | Command introduced in JUNOS Release 8.2. |
| Description | (J4350 and J6350 routing platforms only) Configure the Media Gateway Controller (MGC) list for the TGM550 VoIP module. |
| Options | <p><i>slot-number</i>—Number of the slot in which the TGM550 VoIP module is installed.</p> <p>media-gateway-controller—Configure the MGC list for the TGM550 VoIP module.</p> <p>[<i>ipaddress1 ipaddress2 ipaddress3 ipaddress4</i>]—Configure IP addresses of up to four MGCs to connect to and the order in which to reestablish the H.248 link. The first MGC in the list is the primary MGC. The TGM550 VoIP module searches for the primary MGC first. If the TGM550 VoIP module cannot connect to the primary MGC or loses its connection to the primary MGC, it attempts to connect to the next MGC in the list, and so on.</p> |
| Required Privilege Level | maintenance |
| Related Topics | show tgm fpc |
| List of Sample Output | set tgm fpc on page 708 |
| set tgm fpc | <pre>user@host> set tgm fpc 2 media-gateway-controller [173.26.232.77 10.10.10.30 10.10.10.40]</pre> |

show interfaces (TGM550 Module)

| | |
|---------------------------------|---|
| Syntax | show interfaces <i>vp-pim/0/0</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced in JUNOS Release 8.2. |
| Description | (J4350 and J6350 routing platforms only) Display status information about the specified TGM550 module. |
| Options | <p><i>vp-pim/0/0</i>—Display standard information about the specified TGM550 module.</p> <p><i>none</i>—Display standard status information about the TGM550 module.</p> <p><i>brief detail extensive terse</i>—(Optional) Display the specified level of output.</p> <p><i>descriptions</i>—(Optional) Display interface description strings.</p> <p><i>media</i>—(Optional) Display media-specific information about network interfaces.</p> <p><i>snmp-index snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><i>statistics</i>—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces (TGM550 Module) on page 713</p> <p>show interfaces brief (TGM550 Module) on page 713</p> <p>show interfaces detail (TGM550 Module) on page 713</p> <p>show interfaces extensive (TGM550 Module) on page 714</p> |
| Output Fields | Table 138 on page 709 lists the output fields for the show interfaces (TGM550 Module) command. Output fields are listed in the approximate order in which they appear. |

Table 138: TGM550 Module show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Description | Configured interface description. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |

Table 138: TGM550 Module show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|---|-----------------------|
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Type | Type of interface. | detail extensive none |
| Link-level type | Encapsulation being used on the physical interface—VP-AV. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Speed | Speed in megabits per second (mbps) at which the interface is running. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Link type | Physical interface link type: Full-Duplex or Half-Duplex. | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | All levels |
| Physical info | Information about the physical interface. | detail extensive |
| CoS queues | Number of CoS queues configured. | detail extensive none |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive none |
| Input Rate | Input rate in bits per second (bps) and packets per second (pps). | None specified |
| Output Rate | Output rate in bps and pps. | None specified |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | Statistics for traffic on the interface. <ul style="list-style-type: none"> ■ Input bytes—Number of bytes received on the interface ■ Output bytes—Number of bytes transmitted on the interface. ■ Input packets—Number of packets received on the interface ■ Output packets—Number of packets transmitted on the interface. | detail extensive |

Table 138: TGM550 Module show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|----------------|---|------------------|
| Input errors | <p>Input errors on the interface:</p> <ul style="list-style-type: none"> ■ Errors—Sum of the incoming frame aborts and frame check sequence (FCS) errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's random early detection (RED) mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If it increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Egress queues | Total number of egress queues supported on the specified interface. | detail extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |

Table 138: TGM550 Module show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|--|-----------------------|
| Packet Forwarding Engine configuration | Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ CoS transmit queue—Queue number and its associated user-configured forwarding class name. ■ <i>bandwidth %</i>—Percentage of bandwidth allocated to the queue. The default is 25 percent. ■ Bandwidth <i>bps</i>—Bandwidth allocated to the queue (in bps). ■ <i>buffer %</i>—Percentage of buffer space allocated to the queue. The default is 25 percent. ■ Buffer <i>usec</i>—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: <i>low</i> or <i>high</i>. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are <i>none</i> and <i>exact</i>: <ul style="list-style-type: none"> ■ <i>exact</i>—The queue transmits only up to the configured bandwidth, even if excess bandwidth is available. ■ <i>none</i>—The queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| <i>protocol-family</i> | Protocol family configured on the logical interface. If the protocol is <i>inet</i> , the IP address of the interface is also displayed. | brief |
| Protocol | Protocol family configured on the logical interface. | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Routing table in which the logical interface address is located. For example, <i>0</i> refers to the routing table <i>inet.0</i> . | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |

Table 138: TGM550 Module show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------|---|-----------------------|
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

**show interfaces
(TGM550 Module)**

```

user@host> show interfaces vp-2/0/0
Physical interface: vp-2/0/0, Enabled, Physical link is Up
Interface index: 145, SNMP ifIndex: 21
Type: VP-AV, Link-level type: VP-AV, MTU: 1518, Speed: 10mbps
Device flags   : Present Running
Link type      : Full-Duplex
Link flags     : None
CoS queues     : 8 supported, 8 maximum usable queues
Last flapped   : 2006-10-30 10:03:37 UTC (07:26:46 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)

Logical interface vp-2/0/0.0 (Index 73) (SNMP ifIndex 47)
Flags: Point-To-Point SNMP-Traps Encapsulation: VP-AV
Protocol inet, MTU: 1500
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 31.31.31.20, Local: 33.33.33.1

```

**show interfaces brief
(TGM550 Module)**

```

user@host> show interfaces vp-2/0/0 brief
Physical interface: vp-2/0/0, Enabled, Physical link is Up
Type: VP-AV, Link-level type: VP-AV, MTU: 1518, Speed: 10mbps
Device flags   : Present Running

Logical interface vp-2/0/0.0
Flags: Point-To-Point SNMP-Traps Encapsulation: VP-AV
inet 33.33.33.1    --> 31.31.31.20

```

**show interfaces detail
(TGM550 Module)**

```

user@host> show interfaces vp-2/0/0 detail
Physical interface: vp-2/0/0, Enabled, Physical link is Up
Interface index: 145, SNMP ifIndex: 21, Generation: 147
Type: VP-AV, Link-level type: VP-AV, MTU: 1518, Speed: 10mbps
Device flags   : Present Running
Link type      : Full-Duplex
Link flags     : None
Physical info   : Unspecified
CoS queues     : 8 supported, 8 maximum usable queues
Last flapped   : 2006-10-30 10:03:37 UTC (07:31:33 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes    :          537968          0 bps
Output bytes   :          448102          0 bps
Input packets  :           6750          0 pps
Output packets :           5141          0 pps
Egress queues: 8 supported, 8 in use
Queue counters:

```

| | Queued packets | Transmitted packets | Dropped packets |
|---------------|----------------|---------------------|-----------------|
| 0 best-effort | 5141 | 5141 | 0 |

| | | | |
|----------------|---|---|---|
| 1 expedited-fo | 0 | 0 | 0 |
| 2 assured-forw | 0 | 0 | 0 |
| 3 network-cont | 0 | 0 | 0 |

Logical interface vp-2/0/0.0 (Index 73) (SNMP ifIndex 47) (Generation 142)
 Flags: Point-To-Point SNMP-Traps Encapsulation: VP-AV
 Protocol inet, MTU: 1500, Generation: 147, Route table: 0
 Flags: None
 Filters: Input: pcap, Output: pcap
 Addresses, Flags: Is-Preferred Is-Primary
 Destination: 31.31.31.20, Local: 33.33.33.1, Broadcast: Unspecified,
 Generation: 154

**show interfaces
 extensive (TGM550
 Module)**

```
user@host> show interfaces vp-2/0/0 extensive
Physical interface: vp-2/0/0, Enabled, Physical link is Up
Interface index: 145, SNMP ifIndex: 21, Generation: 147
Type: VP-AV, Link-level type: VP-AV, MTU: 1518, Speed: 10mbps
Device flags   : Present Running
Link type      : Full-Duplex
Link flags     : None
Physical info  : Unspecified
CoS queues     : 8 supported, 8 maximum usable queues
Last flapped   : 2006-10-30 10:03:37 UTC (07:32:49 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes   :          539206          0 bps
Output bytes  :          448993          0 bps
Input packets :           6764          0 pps
Output packets:          5150          0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
Policed discards: 0, Resource errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
Resource errors: 0
Egress queues: 8 supported, 8 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort          5150          5150          0
  1 expedited-fo           0           0          0
  2 assured-forw          0           0          0
  3 network-cont          0           0          0

Packet Forwarding Engine configuration:
Destination slot: 2
Direction : Output
CoS transmit queue      Bandwidth      Buffer Priority
Limit
  0 best-effort          95      9500000      95      0      low
none
  3 network-control      5       500000      5       0      low
none
```

```
Logical interface vp-2/0/0.0 (Index 73) (SNMP ifIndex 47) (Generation 142)
Flags: Point-To-Point SNMP-Traps Encapsulation: VP-AV
Protocol inet, MTU: 1500, Generation: 147, Route table: 0
Flags: None
Filters: Input: pcap, Output: pcap
Addresses, Flags: Is-Preferred Is-Primary
Destination: 31.31.31.20, Local: 33.33.33.1, Broadcast: Unspecified,
Generation: 154
```

show tgm dynamic-call-admission-control

| | |
|---------------------------------|--|
| Syntax | show tgm dynamic-call-admission-control |
| Release Information | Command introduced in JUNOS Release 8.2. |
| Description | (J4350 and J6350 routing platforms only) Display dynamic Call Admission Control (CAC) information. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show tgm dynamic-call-admission-control on page 716 |
| Output Fields | Table 139 on page 716 lists the output fields for the show tgm dynamic-call-admission-control command. Output fields are listed in the approximate order in which they appear. |

Table 139: show tgm dynamic-call-admission-control Output Fields

| Field Name | Field Description |
|---------------------------------|--|
| Reported bearer bandwidth limit | <p>If dynamic CAC is configured on more than one active interface, the TGM550 VoIP module reports the bearer bandwidth limit (BBL) of the active interface with the highest activation priority.</p> <p>If more than one active interface has the same activation priority, the BBL is reported as the number of those interfaces times their lowest BBL. For example if two interfaces with the same activation priority have BBLs of 2000 Kbps and 1500 Kbps, the reported BBL is 3000 Kbps (2 x 1500 Kbps).</p> |
| Interface | Name of interface on which dynamic CAC is configured. |
| State | <p>Link state of the interface: Up or Down.</p> <p>The operational state is the physical state of the interface. If the interface is physically operational, even if it is not configured, the operational state is Up. An operational state of Down indicates a problem with the physical interface.</p> |
| Activation priority | Activation priority configured on the interface. |
| Bearer bandwidth limit (Kbps) | Maximum bandwidth available for voice traffic on the interface. |

```

user@host> show tgm dynamic-call-admission-control
Reported bearer bandwidth limit: 3000 Kbps
Interface      State      Activation  Bearer bandwidth
              priority  limit (Kbps)
ge-0/0/3.0    up         200         3000
tl-6/0/0.0    up         150         1000

```


show tgm fpc

| | |
|--------------------------|--|
| Syntax | show tgm fpc slot-number (media-gateway-controller dsp-capacity) |
| Release Information | Command extended in JUNOS Release 8.5. |
| Description | (J2320, J2350, J4350, and J6350 J-series routing platforms only) Display information about TGM550 VoIP module connectivity and digital signal processor (DSP) capacity. |
| Options | slot-number—Number of the slot in which the TGM550 VoIP module is installed. media-gateway-controller—Display IP addresses of the Media Gateway Controllers (MGCs) configured in the MGC list for the TGM550 VoIP module. dsp-capacity—Display the number of voice channels available on the TGM550 VoIP module. |
| Required Privilege Level | view |
| Related Topics | set tgm fpc |
| List of Sample Output | show tgm fpc 2 media-gateway-controller on page 717 show tgm fpc 3 dsp-capacity on page 717 |
| Output Fields | Table 140 on page 717 lists the output fields for the show tgm fpc command. Output fields are listed in the approximate order in which they appear. |

Table 140: show tgm fpc Output Fields

| Field Name | Field Description |
|-----------------------------|---|
| Media gateway controller(s) | Displays the IP addresses of the Media Gateway Controllers (MGCs) configured in the MGC list for the TGM550 VoIP module. The first MGC in the list is the primary MGC. The TGM550 VoIP module searches for the primary MGC first. If it cannot connect to the primary MGC or loses its connection to the primary MGC, it attempts to connect to the next MGC in the list, and so on. |
| DSP Capacity | Displays the DSP capacity of the TGM VoIP module board in terms of the number of voice channels supported. |

| | |
|--|--|
| show tgm fpc 2 media-gateway-controller | user@host> show tgm fpc 2 media-gateway-controller Media gateway controller(s): 173.26.232.77 10.10.10.30 10.10.10.40 |
| show tgm fpc 3 dsp-capacity | root> Show tgm fpc 3 dsp-capacity DSP Capacity:20 voice channels. |

show tgm telephony-interface-module status

| | |
|---------------------------------|---|
| Syntax | show tgm telephony-interface-module status |
| Release Information | Command extended in JUNOS Release 8.5. |
| Description | (J2320, J2350, J4350, and J6350 routing platforms only) Display the online and offline status of the Telephony Interface Modules installed in a J-series router. |
| Options | This command has no options. |
| Required Privilege Level | view |
| List of Sample Output | show tgm telephony-interface-module on page 718 |
| Output Fields | Table 141 on page 718 lists the output fields for the show tgm telephony-interface-module status command. Output fields are listed in the approximate order in which they appear. |

Table 141: show tgm telephony-interface-module status Output Fields

| Field Name | Field Description |
|----------------|--|
| Slot State | Status of the TIM, either online or offline. |
| Offline Reason | Explanation for the offline state: <ul style="list-style-type: none">■ Busy out■ Out of resources |

```
show tgm telephony-interface-module user@host> show tgm telephony-interface-module status
Slot State      Offline Reason
  1      Offline  Busy out
  2      Online
  5      Online
  6      Online
```

Part 12

Management Interfaces

- Discard Interface Operational Mode Commands on page 721
- Loopback Interface Operational Mode Commands on page 727
- Management Ethernet and Internal Ethernet Interface Operational Mode Commands on page 735

Chapter 25

Discard Interface Operational Mode Commands

Table 142 on page 721 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot the discard (dsc) interface.

Table 142: Discard Interface Operational Mode Commands

| Task | Command |
|--------------------------------|---------------------------|
| Monitor the discard interface. | show interfaces (discard) |

The discard interface is not a physical interface, but a virtual interface that discards packets. You can configure one discard interface. The discard interface allows you to identify the ingress point of a denial-of-service (DoS) attack. When your network is under attack, the target host IP address is identified, and the local policy forwards attacking packets to the discard interface. Traffic routed out of the discard interface is silently discarded.

If an output filter is attached to the interface, the action specified by the filter causes the packets to be logged or counted before the traffic is discarded. For a complete discussion about using the discard interface to protect your network against DoS attacks, see the *JUNOS Policy Framework Configuration Guide*.

Statistics and media displayed by the **show interfaces** command are not relevant for the discard interface and always show values of 0.

show interfaces (discard)

| | |
|---------------------------------|---|
| Syntax | show interfaces dsc <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | Display status information about the specified discard interface. |
| Options | <p>dsc—Display standard information about the specified discard interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—This option is not relevant for the discard interface and always shows a value of 0.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—This option is not relevant for the discard interface and always shows a value of 0.</p> |
| Required Privilege Level | view |
| Related Topics | <p>show interfaces (ATM)</p> <p>show interfaces routing</p> |
| List of Sample Output | <p>show interfaces dsc on page 725</p> <p>show interfaces dsc brief on page 725</p> <p>show interfaces dsc detail on page 725</p> <p>show interfaces dsc extensive on page 726</p> |
| Output Fields | Table 143 on page 722 lists the output fields for the show interfaces (discard) command. Output fields are listed in the approximate order in which they appear. |

Table 143: Discard show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface, whether the interface is enabled, and the state of the physical interface: Up or Down. | All levels |
| Interface index | Physical interface's index number, which reflects its initialization sequence. | detail extensive none |

Table 143: Discard show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-----------------------------------|--|------------------------|
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Type | Type of interface. Software-Pseudo indicates a standard software interface with no associated hardware device. | All levels |
| Link-level type | Encapsulation being used on the physical interface. | All levels |
| MTU | MTU size on the physical interface. | All levels |
| Clocking | Reference clock source. It can be Internal or External . | brief detail extensive |
| Speed | Speed at which the interface is running. | brief detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Encapsulation being used on the physical interface. | detail extensive |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address, Hardware address | Configured MAC address and hardware MAC address. | detail extensive |
| Alternate link address | Backup address of the link. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) . | detail extensive none |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 143: Discard show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Input errors | <p>Input errors on the interface:</p> <ul style="list-style-type: none"> ■ Errors—Sum of incoming frame aborts and FCS errors. ■ Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Number of frames received that are smaller than the runt threshold. ■ Giants—Number of frames received that are larger than the giant threshold. ■ Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that the JUNOS software does not handle. ■ Resource errors—Sum of transmit drops. | detail extensive |
| Output errors | <p>(Extensive only) Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. ■ Errors—Sum of the outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. ■ MTU errors—Number of packets whose size exceeded the MTU of the interface. ■ Resource errors—Sum of transmit drops. | detail extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface. Possible values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | All levels |
| Protocol | Protocol family configured on the logical interface, such as <code>iso</code> , <code>inet6</code> , or <code>mpls</code> . | All levels |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

Table 143: Discard show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------|---|------------------|
| Route Table | Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0. | detail extensive |

```

show interfaces dsc user@host> show interfaces dsc
Physical interface: dsc, Enabled, Physical link is Up
Interface index: 5, SNMP ifIndex: 5
Type: Software-Pseudo, MTU: Unlimited
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags : None
Last flapped : Never
Input packets : 0
Output packets: 0

Logical interface dsc.0 (Index 66) (SNMP ifIndex 235)
Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified
Protocol inet, MTU: Unlimited
Flags: None

show interfaces dsc brief user@host> show interfaces dsc brief
Physical interface: dsc, Enabled, Physical link is Up
Type: Software-Pseudo, Link-level type: Unspecified, MTU: Unlimited, Clocking:
Unspecified, Speed: Unspecified
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps

Logical interface dsc.0
Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified
inet

show interfaces dsc detail user@host> show interfaces dsc detail
Physical interface: dsc, Enabled, Physical link is Up
Interface index: 5, SNMP ifIndex: 5, Generation: 9
Type: Software-Pseudo, Link-level type: Unspecified, MTU: Unlimited, Clocking:
Unspecified, Speed: Unspecified
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link type : Unspecified
Link flags : None
Physical info : Unspecified
Hold-times : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Last flapped : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0

Logical interface dsc.0 (Index 66) (SNMP ifIndex 235) (Generation 6)
Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified

```

```

Protocol inet, MTU: Unlimited, Generation: 14, Route table: 0
Flags: None

```

```

show interfaces dsc user@host> show interfaces dsc extensive
extensive Physical interface: dsc, Enabled, Physical link is Up
            Interface index: 5, SNMP ifIndex: 5, Generation: 9
            Type: Software-Pseudo, Link-level type: Unspecified, MTU: Unlimited, Clocking:
            Unspecified, Speed: Unspecified
            Device flags   : Present Running
            Interface flags: Point-To-Point SNMP-Traps
            Link type      : Unspecified
            Link flags     : None
            Physical info  : Unspecified
            Hold-times     : Up 0 ms, Down 0 ms
            Current address: Unspecified, Hardware address: Unspecified
            Alternate link address: Unspecified
            Last flapped   : Never
            Statistics last cleared: Never
            Traffic statistics:
            Input bytes   : 0
            Output bytes  : 0
            Input packets : 0
            Output packets: 0
            Input errors:
            Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
            Policed discards: 0, Resource errors: 0
            Output errors:
            Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
            Resource errors: 0
            Logical interface dsc.0 (Index 66) (SNMP ifIndex 235) (Generation 6)
            Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified
            Protocol inet, MTU: Unlimited, Generation: 14, Route table: 0

```

Chapter 26

Loopback Interface Operational Mode Commands

Table 144 on page 727 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot the local loopback interface (lo0).

Table 144: Loopback Interface Operational Mode Commands

| Task | Command |
|---------------------------------|----------------------------|
| Monitor the loopback interface. | show interfaces (Loopback) |

The JUNOS software automatically configures one local loopback interface (lo0), choosing the first interface to come online as the default. You can also configure the loopback interface and one or more addresses on the interface. If you configure the loopback interface, it is automatically used for unnumbered interfaces.

A local loopback loops packets, including both data and timing information, back on the local Physical Interface Card (PIC) or Physical Interface Module (PIM). When you configure a local loopback, the interface transmits packets to the channel services unit (CSU) built into the interface. These packets are transmitted onto the circuit toward the far-end device. The PIC or PIM receives back its own transmission and ignores any data sent from the physical circuit and the CSU.

To test a local loopback, issue the **show interfaces *interface-name*** command. If PPP keepalives transmitted on the interface are received by the PIC or PIM, the **Device Flags** field contains the output **Loop-Detected**.

For more information about using the loopback interface to monitor and troubleshoot various interface types, see the *JUNOS Interfaces Network Operations Guide*.

show interfaces (Loopback)

Syntax show interfaces lo0
 <brief | detail | extensive | terse>
 <descriptions>
 <media>
 <snmp-index *snmp-index*>
 <statistics>

Release Information Command introduced before JUNOS Release 7.4.

Description Display status information about the local loopback interface.



NOTE: Logical interface lo0.16385 is the loopback interface for the internal routing instance. Created by the internal routing service process, this interface facilitates internal traffic. It prevents any filter created on loopback lo0.0 from blocking internal traffic.

Options lo0—Display standard status information about the local loopback interface.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information.

snmp-index *snmp-index*—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output show interfaces (Loopback) on page 731
 show interfaces brief (Loopback) on page 732
 show interfaces detail (Loopback) on page 732
 show interfaces extensive (Loopback) on page 733

Output Fields Table 145 on page 728 lists the output fields for the **show interfaces** (loopback) command. Output fields are listed in the approximate order in which they appear.

Table 145: Loopback show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|---------------------------------|-----------------|
| Physical Interface | | |
| Physical Interface | Name of the physical interface. | All levels |

Table 145: Loopback show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|-------------------------|--|-----------------------|
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation type used on the physical interface. | All levels |
| MTU | Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | detail extensive |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive none |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | Media access control (MAC) address of the interface. | detail extensive |
| Alternate link address | Backup link address. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago). | detail extensive |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |

Table 145: Loopback show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------------|---|------------------------|
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because the frames were not recognized or were not of interest. Usually, this field reports protocols that JUNOS does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | brief detail extensive |
| Encapsulation | Encapsulation on the logical interface. | brief detail extensive |
| Input packets | Number of packets received on the logical interface. | None specified |
| Output packets | Number of packets transmitted on the logical interface. | None specified |

Table 145: Loopback show interfaces Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|--------------------|---|-----------------------|
| Traffic statistics | Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Local statistics | Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize. | detail extensive |
| Protocol | Protocol family configured on the logical interface (such as iso or inet6). | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Route table in which this address exists; for example, Route table:0 refers to inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about the address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces user@host> show interfaces lo0
(Loopback) Physical interface: lo0, Enabled, Physical link is Up
Interface index: 6, SNMP ifIndex: 6
Type: Loopback, MTU: Unlimited
Device flags : Present Running Loopback
Interface flags: SNMP-Traps
Link flags : None
Last flapped : Never
Input packets : 0
Output packets: 0

Logical interface lo0.0 (Index 64) (SNMP ifIndex 16)
Flags: SNMP-Traps Encapsulation: Unspecified
Input packets : 0
Output packets: 0
Protocol inet, MTU: Unlimited
Flags: None
Addresses, Flags: Is-Default Is-Primary
Local: 10.0.0.1

```

```

Addresses
  Local: 127.0.0.1
Protocol iso, MTU: Unlimited
Flags: None
Addresses, Flags: Is-Default Is-Primary
  Local: 49.0004.1000.0000.0001

Logical interface lo0.16385 (Index 65) (SNMP ifIndex 76)
  Flags: SNMP-Traps Encapsulation: Unspecified
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: Unlimited
  Flags: None

```

**show interfaces brief
(Loopback)**

```

user@host> show interfaces lo0 brief
Physical interface: lo0, Enabled, Physical link is Up
  Type: Loopback, Link-level type: Unspecified, MTU: Unlimited,
  Clocking: Unspecified, Speed: Unspecified
  Device flags   : Present Running Loopback
  Interface flags: SNMP-Traps

Logical interface lo0.0
  Flags: SNMP-Traps Encapsulation: Unspecified
  inet  10.0.0.1      --> 0/0
        127.0.0.1    --> 0/0
  iso   49.0004.1000.0000.0001

Logical interface lo0.16385
  Flags: SNMP-Traps Encapsulation: Unspecified
  inet

```

**show interfaces detail
(Loopback)**

```

user@host> show interfaces lo0 detail
Physical interface: lo0, Enabled, Physical link is Up
  Interface index: 6, SNMP ifIndex: 6, Generation: 4
  Type: Loopback, Link-level type: Unspecified, MTU: Unlimited,
  Clocking: Unspecified, Speed: Unspecified
  Device flags   : Present Running Loopback
  Interface flags: SNMP-Traps
  Link type      : Unspecified
  Link flags     : None
  Physical info  : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: Unspecified, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 0
    Output bytes: 0
    Input packets: 0
    Output packets: 0
Logical interface lo0.0 (Index 64) (SNMP ifIndex 16) (Generation 3)
  Flags: SNMP-Traps Encapsulation: Unspecified
  Traffic statistics:
    Input bytes : 0
    Output bytes: 0
    Input packets: 0
    Output packets: 0
  Local statistics:
    Input bytes : 0
    Output bytes: 0

```



```

Input packets:          0
Output packets:         0

Protocol inet, MTU: Unlimited, Generation: 10, Route table: 0
  Flags: None
  Addresses, Flags: Is-Default Is-Primary
    Destination: Unspecified, Local: 10.0.0.1, Broadcast: Unspecified,
    Generation: 10
  Addresses, Flags: None
    Destination: Unspecified, Local: 127.0.0.1, Broadcast: Unspecified,
    Generation: 12
Protocol iso, MTU: Unlimited, Generation: 11, Route table: 0
  Flags: None
  Addresses, Flags: Is-Default Is-Primary
    Destination: Unspecified, Local: 49.0004.1000.0000.0001,
    Broadcast: Unspecified, Generation: 14

Logical interface lo0.16385 (Index 65) (SNMP ifIndex 76) (Generation 4)
  Flags: SNMP-Traps Encapsulation: Unspecified
  Traffic statistics:
    Input bytes :          0
    Output bytes :          0
    Input packets:          0
    Output packets:         0
  Local statistics:
    Input bytes :          0
    Output bytes :          0
    Input packets:          0
    Output packets:         0
  Protocol inet, MTU: Unlimited, Generation: 12, Route table: 1
    Flags: None

```

**show interfaces
extensive (Loopback)**

```

user@host> show interfaces lo0 extensive
Physical interface: lo0, Enabled, Physical link is Up
Interface index: 6, SNMP ifIndex: 6, Generation: 4
Type: Loopback, Link-level type: Unspecified, MTU: Unlimited,
Clocking: Unspecified, Speed: Unspecified
Device flags : Present Running Loopback
Interface flags: SNMP-Traps
Link type : Unspecified
Link flags : None
Physical info : Unspecified
Hold-times : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Last flapped : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runt: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0

```

```

Logical interface lo0.0 (Index 64) (SNMP ifIndex 16) (Generation 3)

```

```

Flags: SNMP-Traps Encapsulation: Unspecified
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:         0
  Output packets:        0
Local statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:         0
  Output packets:        0
Protocol inet, MTU: Unlimited, Generation: 10, Route table: 0
  Flags: None
  Addresses, Flags: Is-Default Is-Primary
    Destination: Unspecified, Local: 10.0.0.1, Broadcast: Unspecified,
    Generation: 10
  Addresses, Flags: None
    Destination: Unspecified, Local: 127.0.0.1, Broadcast: Unspecified,
    Generation: 12
Protocol iso, MTU: Unlimited, Generation: 11, Route table: 0
  Flags: None
  Addresses, Flags: Is-Default Is-Primary
    Destination: Unspecified, Local: 49.0004.1000.0000.0001,
    Broadcast: Unspecified, Generation: 14

Logical interface lo0.16385 (Index 65) (SNMP ifIndex 76) (Generation 4)
Flags: SNMP-Traps Encapsulation: Unspecified
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:         0
  Output packets:        0
Local statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:         0
  Output packets:        0
Protocol inet, MTU: Unlimited, Generation: 12, Route table: 1
  Flags: None

```

Chapter 27

Management Ethernet and Internal Ethernet Interface Operational Mode Commands

Table 146 on page 735 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot the management Ethernet interface and, in the case of M-series and T-series routing platforms, the internal Ethernet interface.

Table 146: Management Ethernet and Internal Ethernet Interface Operational Mode Commands

| Task | Command |
|---|--|
| Monitor the M-series and T-series management Ethernet and internal Ethernet interfaces. | show interfaces (M-series and T-series Management and Internal Ethernet) |
| Monitor the J-series management Ethernet interface. | show interfaces (J-series Management Ethernet) |

On the M-series and T-series routing platforms, the JUNOS software automatically creates the routing platform's management Ethernet interface, **fxp0**, which is an out-of-band management interface for connecting to the router, and the internal Ethernet interface, **fxp1**, which connects the Routing Engine to the Packet Forwarding Engine. If the platform has redundant Routing Engines, another internal Ethernet interface, **fxp2**, is created to connect the second Routing Engine (**re1**) to the Packet Forwarding Engine.

On the J-series routing platform, the JUNOS software automatically creates the routing platform's management Ethernet interface, **fe-0/0/0**, which is an out-of-band management interface for connecting to the router.

show interfaces (M-series and T-series Management and Internal Ethernet)

Syntax show interfaces fxp(0 | 1)
 <brief | detail | extensive | terse>
 <descriptions>
 <media>
 <snmp-index *snmp-index*>
 <statistics>

Release Information Command introduced before JUNOS Release 7.4.

Description (M-series and T-series routing platforms only) Display status information about the management Ethernet (fxp0) and internal Ethernet (fxp1) interfaces.

Options fxp(0 | 1)—Display standard information about the management Ethernet or internal Ethernet interface, respectively.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information.

snmp-index *snmp-index*—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output show interfaces brief (Management Ethernet) on page 739
 show interfaces (Management Ethernet) on page 739
 show interfaces detail (Management Ethernet) on page 740
 show interfaces extensive (Management Ethernet) on page 740
 show interfaces brief (Management Ethernet) on page 741
 show interfaces (Internal Ethernet) on page 741
 show interfaces detail (Internal Ethernet) on page 741
 show interfaces extensive (internal Ethernet) on page 742

Output Fields Table 147 on page 737 lists the output fields for the **show interfaces** (management) command on the M-series and T-series routing platforms. Output fields are listed in the approximate order in which they appear.

Table 147: M-series and T-series Management and Internal Ethernet show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|-----------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88 | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Type | Type of interface. | All levels |
| Link-level type | Encapsulation type used on the physical interface. | All levels |
| MTU | Maximum transmission unit (MTU)—Size of the largest packet to be transmitted. | All levels |
| Clocking | Reference clock source of the interface. | All levels |
| Speed | Network speed on the interface. | All levels |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | All levels |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | All levels |
| Link type | Data transmission type. | detail extensive none |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | detail extensive |
| Physical info | Information about the physical interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive none |
| Hardware address | Media access control (MAC) address of the interface. | detail extensive none |
| Alternate link address | Backup link address. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive none |
| Input packets | Number of packets received on the physical interface. | None specified |
| Output packets | Number of packets transmitted on the physical interface. | None specified |

Table 147: M-series and T-series Management and Internal Ethernet show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------------|---|-----------------------|
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the logical and physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Giants—Frames received larger than the giant threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because they were not recognized or were not of interest. Usually, this field reports protocols that JUNOS does not support. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ Resource errors—Sum of transmit drops. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | detail extensive none |
| SNMP ifIndex | Logical interface SNMP interface index number. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | All levels |
| Encapsulation | Encapsulation on the logical interface. | detail extensive none |
| inet | IP address of the logical interface. | brief |

Table 147: M-series and T-series Management and Internal Ethernet show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|------------------|--|-----------------------|
| Protocol | Protocol family configured on the logical interface (such as iso or inet6). | detail extensive none |
| MTU | MTU size on the logical interface. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route table | Route table in which this address exists. For example, Route table:0 refers to inet.0. | detail extensive |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive none |
| Addresses, Flags | Information about address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive none |
| Destination | IP address of the remote side of the connection. | detail extensive none |
| Local | IP address of the logical interface. | detail extensive none |
| Broadcast | Broadcast address. | detail extensive none |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

show interfaces brief
(Management Ethernet)

```

user@host> show interfaces fxp0 brief
Physical interface: fxp0, Enabled, Physical link is Up
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps

  Logical interface fxp0.0
    Flags: SNMP-Traps Encapsulation: ENET2
    inet  192.168.70.143/21

```

show interfaces
(Management Ethernet)

```

user@host> show interfaces fxp0
Physical interface: fxp0, Enabled, Physical link is Up
  Interface index: 1, SNMP ifIndex: 1
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Half-Duplex
  Current address: 00:a0:a5:56:01:89, Hardware address: 00:a0:a5:56:01:89
  Last flapped   : Never
    Input packets : 80804
    Output packets: 1105

  Logical interface fxp0.0 (Index 2) (SNMP ifIndex 13)
    Flags: SNMP-Traps Encapsulation: ENET2
    Protocol inet, MTU: 1500
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 192.168.64/21, Local: 192.168.70.143,
      Broadcast: 192.168.71.255

```

**show interfaces detail
(Management Ethernet)**user@host> **show interfaces fxp0 detail**

```
Physical interface: fxp0, Enabled, Physical link is Up
  Interface index: 1, SNMP ifIndex: 1, Generation: 0
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Half-Duplex
  Physical info  : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:a0:a5:56:01:89, Hardware address: 00:a0:a5:56:01:89
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :           6484031
    Output bytes  :           167503
    Input packets :           81008
    Output packets:           1110

Logical interface fxp0.0 (Index 2) (SNMP ifIndex 13) (Generation 1)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500, Generation: 6, Route table: 0
  Flags: Is-Primary
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.64/21, Local: 192.168.70.143,
    Broadcast: 192.168.71.255, Generation: 1
```

**show interfaces
extensive (Management
Ethernet)**user@host> **show interfaces fxp0 extensive**

```
Physical interface: fxp0, Enabled, Physical link is Up
  Interface index: 1, SNMP ifIndex: 1, Generation: 0
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Half-Duplex
  Physical info  : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:a0:a5:56:01:89, Hardware address: 00:a0:a5:56:01:89
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :           6678904
    Output bytes  :           169657
    Input packets :           83946
    Output packets:           1127
  Input errors:
    Errors: 12, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
    Resource errors: 0

Logical interface fxp0.0 (Index 2) (SNMP ifIndex 13) (Generation 1)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500, Generation: 6, Route table: 0
  Flags: Is-Primary
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.64/21, Local: 192.168.70.143,
    Broadcast: 192.168.71.255, Generation: 1
```



```

show interfaces brief      user@host> show interfaces fxp1 brief
(Management Ethernet)    Physical interface: fxp1, Enabled, Physical link is Up
                             Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
                             Speed: 100mbps
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps

                             Logical interface fxp1.0
                             Flags: SNMP-Traps Encapsulation: ENET2
                             inet 10.0.0.4/8
                             inet6 fe80::200:ff:fe00:4/64
                             fec0::10:0:0:4/64
                             tnp 4

show interfaces          user@host> show interfaces fxp1
(Internal Ethernet)      Physical interface: fxp1, Enabled, Physical link is Up
                             Interface index: 2, SNMP ifIndex: 2
                             Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Speed: 100mbps
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps
                             Link type      : Full-Duplex
                             Current address: 02:00:00:00:00:04, Hardware address: 02:00:00:00:00:04
                             Last flapped   : Never
                             Input packets  : 30655
                             Output packets : 33323

                             Logical interface fxp1.0 (Index 3) (SNMP ifIndex 14)
                             Flags: SNMP-Traps Encapsulation: ENET2
                             Protocol inet, MTU: 1500
                             Flags: Is-Primary
                             Addresses, Flags: Is-Default Is-Preferred Is-Primary
                             Destination: 10/8, Local: 10.0.0.4, Broadcast: 10.255.255.255
                             Protocol inet6, MTU: 1500
                             Flags: Is-Primary
                             Addresses, Flags: Is-Preferred
                             Destination: fe80::/64, Local: fe80::200:ff:fe00:4
                             Addresses, Flags: Is-Default Is-Preferred Is-Primary
                             Destination: fec0::/64, Local: fec0::10:0:0:4
                             Protocol tnp, MTU: 1500
                             Flags: Primary, Is-Primary
                             Addresses
                             Local: 4

show interfaces detail   user@host> show interfaces fxp1 detail
(Internal Ethernet)      Physical interface: fxp1, Enabled, Physical link is Up
                             Interface index: 2, SNMP ifIndex: 2, Generation: 1
                             Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
                             Speed: 100mbps
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps
                             Link type      : Full-Duplex
                             Physical info  : Unspecified
                             Hold-times     : Up 0 ms, Down 0 ms
                             Current address: 02:00:00:00:00:04, Hardware address: 02:00:00:00:00:04
                             Alternate link address: Unspecified
                             Last flapped   : Never
                             Statistics last cleared: Never
                             Traffic statistics:
                             Input bytes   :          2339969
                             Output bytes  :          15880707
                             Input packets :          30758

```

Output packets: 33443

```
Logical interface fxp1.0 (Index 3) (SNMP ifIndex 14) (Generation 2)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500, Generation: 7, Route table: 1
    Flags: Is-Primary
    Addresses, Flags: Is-Default Is-Preferred Is-Primary
      Destination: 10/8, Local: 10.0.0.4, Broadcast: 10.255.255.255,
      Generation: 3
  Protocol inet6, MTU: 1500, Generation: 8, Route table: 1
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred
      Destination: fe80::/64, Local: fe80::200:ff:fe00:4,
      Broadcast: Unspecified, Generation: 5
    Addresses, Flags: Is-Default Is-Preferred Is-Primary
      Destination: fec0::/64, Local: fec0::10:0:0:4, Broadcast: Unspecified,
      Generation: 7
  Protocol tnp, MTU: 1500, Generation: 9, Route table: 1
    Flags: Primary, Is-Primary
    Addresses, Flags: None
      Destination: Unspecified, Local: 4, Broadcast: Unspecified,
      Generation: 8
```

**show interfaces
extensive
(internal Ethernet)**

```
user@host> show interfaces fxp1 extensive
Physical interface: fxp1, Enabled, Physical link is Up
  Interface index: 2, SNMP ifIndex: 2, Generation: 1
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Physical info   : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 02:00:00:00:00:04, Hardware address: 02:00:00:00:00:04
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   : 2349897
    Output bytes  : 15888605
    Input packets : 30896
    Output packets: 33607
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runt: 0, Giants: 0,
    Policed discards: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
    Resource errors: 0

Logical interface fxp1.0 (Index 3) (SNMP ifIndex 14) (Generation 2)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500, Generation: 7, Route table: 1
    Flags: Is-Primary
    Addresses, Flags: Is-Default Is-Preferred Is-Primary
      Destination: 10/8, Local: 10.0.0.4, Broadcast: 10.255.255.255,
      Generation: 3
  Protocol inet6, MTU: 1500, Generation: 8, Route table: 1
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred
      Destination: fe80::/64, Local: fe80::200:ff:fe00:4,
      Broadcast: Unspecified, Generation: 5
```

```
Addresses, Flags: Is-Default Is-Preferred Is-Primary
  Destination: fec0::/64, Local: fec0::10:0:0:4, Broadcast: Unspecified,
  Generation: 7
Protocol tnp, MTU: 1500, Generation: 9, Route table: 1
Flags: Primary, Is-Primary
Addresses, Flags: None
  Destination: Unspecified, Local: 4, Broadcast: Unspecified,
  Generation: 8
```

show interfaces (J-series Management Ethernet)

| | |
|---------------------------------|--|
| Syntax | show interfaces fe-0/0/0<.0> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics> |
| Release Information | Command introduced before JUNOS Release 7.4. |
| Description | (J-series routing platform only) Display status information about the management Ethernet interface. |
| Options | <p>fe-0/0/0<.0>—Display standard information about the management Ethernet or internal Ethernet interface, respectively.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p> |
| Required Privilege Level | view |
| List of Sample Output | <p>show interfaces brief (Management Ethernet) on page 750</p> <p>show interfaces (Management Ethernet) on page 750</p> <p>show interfaces detail (Management Ethernet) on page 751</p> <p>show interfaces extensive (Management Ethernet) on page 752</p> |
| Output Fields | Table 148 on page 744 lists the output fields for the show interfaces (management) command on the J-series routing platform. Output fields are listed in the approximate order in which they appear. |

Table 148: J-series Management Ethernet show interfaces Output Fields

| Field Name | Field Description | Level of Output |
|---------------------------|--|------------------|
| Physical Interface | | |
| Physical interface | Name of the physical interface. | All levels |
| Link | Status of the link: up or down. | All levels |
| Enabled | State of the interface. Possible values are described in “Enabled Field” on page 88. | All levels |
| Interface index | Physical interface index number, which reflects its initialization sequence. | detail extensive |

Table 148: J-series Management Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------|--|------------------------|
| SNMP ifIndex | SNMP index number for the physical interface. | detail extensive |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Description | Description and name of the interface. | detail extensive |
| Link-level type | Encapsulation type used on the physical interface. | brief detail extensive |
| MTU | Maximum transmission unit (MTU). Size of the largest packet to be transmitted. | brief detail extensive |
| Speed | Network speed on the interface. | brief detail extensive |
| Loopback | Whether loopback is enabled and the type of loopback (either <i>local</i> or <i>remote</i>). | brief detail extensive |
| Source filtering | Whether source filtering is configured. | brief detail extensive |
| Flow control | Whether flow control is enabled or disabled. | brief detail extensive |
| Device flags | Information about the physical device. Possible values are described in “Device Flags” on page 89. | brief detail extensive |
| Interface flags | Information about the interface. Possible values are described in “Interface Flags” on page 90. | brief detail extensive |
| Link flags | Information about the link. Possible values are described in “Link Flags” on page 91. | brief detail extensive |
| CoS queues | Number of CoS queues supported on this interface. | detail extensive |
| Hold-times | Current interface hold-time up and hold-time down. Value is in milliseconds. | detail extensive |
| Current address | Configured MAC address. | detail extensive |
| Hardware address | Media access control (MAC) address of the interface. | detail extensive |
| Last flapped | Date, time, and how long ago the interface went from down to up. The format is <i>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</i> . For example, <i>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</i> . | detail extensive |
| Statistics last cleared | Time when the statistics for the interface were last set to zero. | detail extensive |
| Traffic statistics | <p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | detail extensive |

Table 148: J-series Management Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|----------------|--|------------------|
| Input errors | <ul style="list-style-type: none"> ■ Errors—Input errors on the interface. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. ■ Framing errors—Number of packets received with an invalid frame checksum (FCS). ■ Runts—Frames received smaller than the runt threshold. ■ Policed Discards—Frames that the incoming packet match code discarded because the frames did not recognize them or were not of interest. Usually, this field reports protocols that JUNOS does not support. ■ L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. ■ L2 channel errors—Number of times the software could not find a valid logical interface for an incoming frame. ■ L2 mismatch timeouts—Number of malformed or short packets that cause the incoming packet handler to discard the frame as unreadable. ■ FIFO errors—Number of FIFO errors in the receive direction as reported by the ASIC on the PIM. If this value is ever nonzero, the PIM is probably malfunctioning. ■ Resource errors—Sum of transmit drops. | extensive |
| Output errors | <ul style="list-style-type: none"> ■ Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. ■ Errors—Sum of outgoing frame aborts and FCS errors. ■ Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC RED mechanism. ■ Collisions—Number of Ethernet collisions. ■ Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. ■ HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. ■ FIFO errors—Number of FIFO errors in the receive direction as reported by the ASIC on the PIM. If this value is ever nonzero, the PIM is probably malfunctioning. ■ MTU errors—Number of packets larger than the MTU threshold. ■ Resource errors—Sum of transmit drops. | extensive |
| Queue counters | <p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> ■ Queued packets—Number of queued packets. ■ Transmitted packets—Number of transmitted packets. ■ Dropped packets—Number of packets dropped by the ASIC's RED mechanism. | detail extensive |

Table 148: J-series Management Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------------------------|--|------------------|
| Active alarms and Active defects | <p>Ethernet-specific defects that can prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. These fields can contain the value None or Link.</p> <ul style="list-style-type: none"> ■ None—There are no active defects or alarms. ■ Link—Interface has lost its link state, which usually means that the cable is unplugged, the far-end system has been turned off, or the PIM is malfunctioning. | detail extensive |
| MAC statistics | <p>Statistics reported by the PIM's MAC subsystem, including the following:</p> <ul style="list-style-type: none"> ■ Total octets and total packets —Total number of sent and received octets and packets. ■ Unicast, broadcast, and multicast packets—Number of unicast, broadcast, and multicast packets. ■ CRC/Align errors—Total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad FCS with an integral number of octets (FCS error) or a bad FCS with a nonintegral number of octets (alignment error). ■ FIFO errors—Number of FIFO errors that are reported by the ASIC on the PIM. If this value is ever nonzero, the PIC is probably malfunctioning. ■ MAC control frames—Number of MAC control frames. ■ MAC pause frames—Number of MAC control frames with pause operational code. ■ Oversized frames—Number of frames that exceed the MTU. ■ Jabber frames—Number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. This definition of jabber is different from the definition in IEEE-802.3 section 8.2.1.5 (10Base5) and section 10.3.1.4 (10Base2). These documents define jabber as the condition in which any packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms. ■ Fragment frames—Total number of packets received that were less than 64 octets (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. Fragment frames normally increment because both runts (which are normal occurrences caused by collisions) and noise hits are counted. ■ VLAN tagged frames—Number of frames that are VLAN tagged. The system uses the TPID of 0x8100 in the frame to determine whether a frame is tagged or not. ■ Code violations—Number of times an event caused the PHY to indicate “Data reception error” or “invalid data symbol error”. | extensive |

Table 148: J-series Management Ethernet show interfaces Output Fields (*continued*)

| Field Name | Field Description | Level of Output |
|-------------------|---|-----------------|
| Filter statistics | <p>Statistics reported by the PIM's MAC address filter subsystem. The filtering is done by the content-addressable memory (CAM) on the PIM. The filter examines a packet's source and destination MAC addresses to determine whether the packet should enter the system or be rejected.</p> <ul style="list-style-type: none"> ■ Input packet count—Number of packets received from the MAC hardware that the filter processed. ■ Input packet rejects—Number of packets that the filter rejected because of either the source MAC address or the destination MAC address. ■ Input DA rejects—Number of packets that the filter rejected because the destination MAC address of the packet is not on the accept list. It is normal for this value to increment. When it increments very quickly and no traffic is entering the router from the far-end system, either a bad ARP entry exists on the far-end system, or multicast routing is not on and the far-end system is sending many multicast packets to the local router (which the router is rejecting). ■ Input SA rejects—Number of packets that the filter rejected because the source MAC address of the packet is not on the accept list. The value in this field should increment only if source MAC address filtering has been enabled. If filtering is enabled, if the value increments quickly, and if the system is not receiving traffic that it should from the far-end system, it means that the user-configured source MAC addresses for this interface are incorrect. ■ Output packet count—Number of packets that the filter has given to the MAC hardware. ■ Output packet pad count—Number of packets the filter padded to the minimum Ethernet size (60 bytes) before giving the packet to the MAC hardware. Usually, padding is done only on small ARP packets, but some very small IP packets can also require padding. If this value increments rapidly, either the system is trying to find an ARP entry for a far-end system that does not exist or it is misconfigured. ■ Output packet error count—Number of packets with an indicated error that the filter was given to transmit. These packets are usually aged packets or are the result of a bandwidth problem. On a normal system, the value of this field should not increment. ■ CAM destination filters, CAM source filters—Number of entries in the CAM dedicated to destination and source MAC address filters. There can only be up to 64 source entries. If source filtering is disabled, which is the default, the values for these fields should be 0. | extensive |

Table 148: J-series Management Ethernet show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--|---|------------------------|
| Autonegotiation information | <p>Information about link autonegotiation.</p> <ul style="list-style-type: none"> ■ Negotiation status: <ul style="list-style-type: none"> ■ Incomplete—Ethernet interface has the speed or link mode configured. ■ No autonegotiation—Remote Ethernet interface has the speed or link mode configured, or does not perform autonegotiation. ■ Complete—Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process is successful. ■ Link partner status—OK when the Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process is successful. ■ Link partner—Depending on the capability of the attached Ethernet device, either Full-duplex or Half-duplex. ■ Flow control—Types of flow control supported by the remote Ethernet device. | extensive |
| Packet Forwarding Engine configuration | <p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> ■ Destination slot—FPC slot number. ■ CoS transmit queue—Queue number and its associated user-configured forwarding class name. <ul style="list-style-type: none"> ■ bandwidth %—Percentage of bandwidth allocated to the queue. ■ Bandwidth bps—Bandwidth allocated to the queue (in bps). ■ buffer %—Percentage of buffer space allocated to the queue. ■ Buffer usec—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. ■ Priority—Queue priority: low or high. ■ Limit—Displayed if rate limiting is configured for the queue. Possible values are none and exact. If exact is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available. | extensive |
| Logical Interface | | |
| Logical interface | Name of the logical interface. | All levels |
| Index | Logical interface index number, which reflects its initialization sequence. | All levels |
| SNMP ifIndex | Logical interface SNMP interface index number. | All levels |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Description | Description and name of the interface. | brief detail extensive |
| Flags | Information about the logical interface; values are described in “Logical Interface Flags” on page 91. | brief detail extensive |
| Encapsulation | Encapsulation on the logical interface. | brief detail extensive |

Table 148: J-series Management Ethernet show interfaces Output Fields (continued)

| Field Name | Field Description | Level of Output |
|--------------------|---|------------------|
| Traffic statistics | <p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the interface. ■ Input packets, Output packets—Number of packets received and transmitted on the interface. | extensive |
| Protocol | Protocol family configured on the logical interface (such as <code>iso</code> or <code>inet6</code>). | All levels |
| MTU | MTU size on the logical interface. | All levels |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |
| Route Table | Route table in which this address exists. for example, <code>Route table:0</code> refers to <code>inet.0</code> . | All levels |
| Flags | Information about the protocol family flags. Possible values are described in “Family Flags” on page 89. | detail extensive |
| Addresses, Flags | Information about address flags. Possible values are described in “Addresses, Flags” on page 88. | detail extensive |
| Destination | IP address of the remote side of the connection. | All levels |
| Local | IP address of the logical interface. | All levels |
| Broadcast | Broadcast address. | All levels |
| Generation | Unique number for use by Juniper Networks technical support only. | detail extensive |

```

show interfaces brief      user@host> show interfaces fe-0/0/0 brief
(Management Ethernet)    Physical interface: fe-0/0/0, Enabled, Physical link is Up
                             Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
                             Source filtering: Disabled, Flow control: Enabled
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps Internal: 0x4000

                             Logical interface fe-0/0/0.0
                             Flags: SNMP-Traps 0x1000000 Encapsulation: ENET2
                             inet  192.168.69.55/21

show interfaces          user@host> show interfaces fe-0/0/0
(Management Ethernet)    Physical interface: fe-0/0/0, Enabled, Physical link is Up
                             Interface index: 137, SNMP ifIndex: 31
                             Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
                             Source filtering: Disabled, Flow control: Enabled
                             Device flags   : Present Running
                             Interface flags: SNMP-Traps Internal: 0x4000
                             CoS queues    : 8 supported, 8 in use

```

Current address: 00:05:85:c3:84:d0, Hardware address: 00:05:85:c3:84:d0
 Last flapped : 2005-12-19 15:35:53 PST (15w0d 22:17 ago)
 Input rate : 243656 bps (506 pps)
 Output rate : 2080 bps (3 pps)
 Active alarms : None
 Active defects : None

Logical interface fe-0/0/0.0 (Index 67) (SNMP ifIndex 45)
 Flags: SNMP-Traps 0x1000000 Encapsulation: ENET2
 Protocol inet, MTU: 1500
 Flags: Is-Primary
 Addresses, Flags: Is-Default Is-Preferred Is-Primary
 Destination: 192.168.64/21, Local: 192.168.69.55,
 Broadcast: 192.168.71.255

**show interfaces detail
 (Management Ethernet)**

```
user@host> show interfaces fe-0/0/0 detail
Physical interface: fe-0/0/0, Enabled, Physical link is Up
Interface index: 137, SNMP ifIndex: 31, Generation: 18
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
CoS queues : 8 supported, 8 in use
Hold-times : Up 0 ms, Down 0 ms
Current address: 00:05:85:c3:84:d0, Hardware address: 00:05:85:c3:84:d0
Last flapped : 2005-12-19 15:35:53 PST (15w0d 22:25 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :          18192489978          11520 bps
Output bytes :          338573758          2824 bps
Input packets:          251397914           17 pps
Output packets:          2840667           3 pps
Queue counters:      Queued packets  Transmitted packets  Dropped packets

  0 best-effort          1308091          1308091           0
  1 expedited-fo           0              0           0
  2 assured-forw          0              0           0
  3 network-cont          0              0           0
  4 be-class              0              0           0
  5 ef-class              0              0           0
  6 af-class             1532576          1532576           0

Active alarms : None
Active defects : None

Logical interface fe-0/0/0.0 (Index 67) (SNMP ifIndex 45) (Generation 5)
Flags: SNMP-Traps 0x1000000 Encapsulation: ENET2
Protocol inet, MTU: 1500, Generation: 9, Route table: 0
Flags: Is-Primary
Addresses, Flags: Is-Default Is-Preferred Is-Primary
Destination: 192.168.64/21, Local: 192.168.69.55,
Broadcast: 192.168.71.255, Generation: 7
```

```

show interfaces
extensive (Management Ethernet)
user@host> show interfaces fe-0/0/0 detail
Physical interface: fe-0/0/0, Enabled, Physical link is Up
  Interface index: 137, SNMP ifIndex: 31, Generation: 18
  Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  CoS queues     : 8 supported, 8 in use
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:05:85:c3:84:d0, Hardware address: 00:05:85:c3:84:d0
  Last flapped   : 2005-12-19 15:35:53 PST (15w0d 22:26 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :          18192523184          8848 bps
    Output bytes  :          338578715          2656 bps
    Input packets :          251398326          16 pps
    Output packets:          2840696          4 pps
  Input errors:
    Errors: 4273531220, Drops: 0, Framing errors: 0, Runts: 0,
    Policed discards: 187, L3 incompletes: 0, L2 channel errors: 0,
    L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 1, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,

    FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
  Queue counters:
    Queued packets  Transmitted packets  Dropped packets

    0 best-effort          1308111          1308111          0
    1 expedited-fo          0          0          0
    2 assured-forw          0          0          0
    3 network-cont          0          0          0
    4 be-class              0          0          0
    5 ef-class              0          0          0
    6 af-class              1532585          1532585          0

  Active alarms : None
  Active defects : None
  MAC statistics:
    Receive          Transmit
    Total octets      18544532244      360434659
    Total packets      251398493      2840690
    Unicast packets      1141188      2558770
    Broadcast packets      244048157      281920
    Multicast packets      6209148      0
    CRC/Align errors      1121446      0
    FIFO errors          0      0
    MAC control frames      0      0
    MAC pause frames      0      0
    Oversized frames      591
    Jabber frames          0
    Fragment frames          0
    VLAN tagged frames      0
    Code violations          0
  Filter statistics:
    Input packet count      13114864305
    Input packet rejects      12863465812

```

```

Input DA rejects          12863465812
Input SA rejects          0
Output packet count              0
Output packet pad count         0
Output packet error count       0
CAM destination filters: 2, CAM source filters: 0
Autonegotiation information:
  Negotiation status: No-autonegotiation, Link partner status: Ok,
  Link partner: Unknown, Flow control: None
Packet Forwarding Engine configuration:
  Destination slot: 0
  CoS transmit queue      Bandwidth      Buffer      Priority  Limit
                           %             bps       %        usec
0 best-effort             95      95000000  95         0        low  none
3 network-control         5       5000000   5          0        low  none

Logical interface fe-0/0/0.0 (Index 67) (SNMP ifIndex 45) (Generation 5)
Flags: SNMP-Traps 0x1000000 Encapsulation: ENET2
Protocol inet, MTU: 1500, Generation: 9, Route table: 0
Flags: Is-Primary
Addresses, Flags: Is-Default Is-Preferred Is-Primary
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