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Release

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Abbreviated Table of Contents

	About This Guide	xvii
Part 1	About Interfaces	
Chapter 1	Interface Types	3
Chapter 2	Common Interface Commands	23
Chapter 3	Common Output Fields	111
Part 2	Ethernet Interfaces	
Chapter 4	Ethernet Interface Operational Mode Commands	121
Chapter 5	VRRP Operational Mode Commands	313
Part 3	Digital Transmission Interfaces	
Chapter 6	Digital Transmission Interface Operational Mode Commands	327
Part 4	IP Demux Interfaces	
Chapter 7	IP Demux Interface Operational Mode Commands	367
Part 5	PPP and PPPoE Interfaces	
Chapter 8	PPP Interface Operational Mode Commands	377
Chapter 9	PPPoE Interface Operational Mode Commands	397
Part 6	Serial Interfaces	
Chapter 10	Serial Interface Operational Mode Commands	427
Part 7	Optical Interfaces	
Chapter 11	SONET/SDH Interface Operational Mode Commands	443
Part 8	ATM Interfaces	
Chapter 12	ATM Interface Operational Mode Commands	495
Chapter 13	ILMI Interface Operational Mode Commands	545
Part 9	ISDN Interfaces	
Chapter 14	ISDN Interface Operational Mode Commands	553

Part 10	Channelized Interfaces
Chapter 15	Channelized E1 Interface Operational Mode Commands 599
Chapter 16	Channelized OC Interface Operational Commands 617
Chapter 17	Channelized STM1 Interface Operational Mode Commands 649
Chapter 18	Channelized T1 and T3 Interface Operational Mode Commands 669
Part 11	Services Interfaces
Chapter 19	Adaptive Services Interface Operational Mode Commands 703
Chapter 20	Encryption Interface Operational Mode Commands 717
Chapter 21	Flow Collector and Monitoring Interface Operational Mode Commands 725
Chapter 22	Link Services Interface Operational Mode Commands 741
Chapter 23	Tunnel Services Interface Operational Mode Commands 793
Chapter 24	VoIP Interface Operational Mode Commands 823
Part 12	Management Interfaces
Chapter 25	Discard Interface Operational Mode Commands 839
Chapter 26	Loopback Interface Operational Mode Commands 845
Chapter 27	Management Ethernet and Internal Ethernet Interface Operational Mode Commands 853
Part 13	Index
	Index 883
	Index of Statements and Commands 893

Table of Contents

	About This Guide	xvii
	Junos Documentation and Release Notes	xvii
	Objectives	xvii
	Audience	xviii
	Supported Platforms	xix
	Using the Indexes	xix
	Documentation Conventions	xix
	Documentation Feedback	xxi
	Requesting Technical Support	xxi
	Self-Help Online Tools and Resources	xxi
	Opening a Case with JTAC	xxii
Part 1	About Interfaces	
Chapter 1	Interface Types	3
	Interface Naming Conventions	3
	Physical Part of an Interface Name	3
	M Series and T Series Router Interface Names	3
	MX Series Router Interface Names	4
	J Series Interface Names	4
	Logical Part of an Interface Name	4
	Channel Identifier Part of an Interface Name	5
	Wildcard Characters in Interface Names	5
	Discard Interface	7
	Loopback Interface	7
	Management Ethernet and Internal Ethernet Interfaces	7
	Management Ethernet and Internal Ethernet Interfaces (M Series, MX Series, T Series)	7
	Management Ethernet and Internal Ethernet Interfaces Overview (M Series, MX Series, T Series)	7
	TX Matrix Plus and T1600 Router (Routing Matrix) Management Ethernet Interfaces	8
	TX Matrix Plus Router Internal Ethernet Interfaces	8
	T1600 Routers (Routing Matrix) Internal Ethernet Interfaces	9
	J Series Management Ethernet Interface	9
	Nonconfigurable Interfaces	9
	Physical Interfaces	10
	M Series and T Series Router Physical Interfaces	10
	MX Series Router Physical Interfaces	13
	J Series Router Physical Interfaces	14

	Logical Interfaces Assigned to a Logical System	15
	Logical Systems Overview	15
	Logical System Configuration Overview	16
	Scope of Logical System Administration	16
	Example: show interfaces terse	17
	Services Interfaces	20
	M Series and T Series Services Interfaces	20
	J Series Services Interfaces	22
	Container Interfaces	22
Chapter 2	Common Interface Commands	23
	clear interfaces interval	25
	clear interfaces statistics	27
	clear interfaces interface-set statistics	28
	show interfaces brief	29
	show interfaces descriptions	31
	show interfaces destination-class	33
	show interfaces detail	35
	show interfaces extensive	37
	show interfaces filters	46
	show interfaces interval	48
	show interfaces media	50
	show interfaces policers	52
	show interfaces queue	54
	show interfaces routing	86
	show interfaces routing summary	92
	show interfaces routing-instance	94
	show interfaces snmp-index	96
	show interfaces source-class	97
	show interfaces statistics	99
	show interfaces terse	109
Chapter 3	Common Output Fields	111
	Common Output Fields Description	111
	Destination Class Field	111
	Enabled Field	111
	Filters Field	112
	Flags Fields	112
	Addresses, Flags Field	112
	Device Flags Field	112
	Family Flags Field	113
	Interface Flags Field	114
	Link Flags Field	114
	Logical Interface Flags Field	115
	Label-Switched Interface Traffic Statistics Field	115
	Policer Field	116
	Protocol Field	116
	RPF Failures Field	117
	Source Class Field	117

Part 2

Ethernet Interfaces

Chapter 4

Ethernet Interface Operational Mode Commands	121
clear auto-configuration interfaces	125
clear interfaces mac-database	126
clear interfaces mac-database statistics	127
clear interfaces interface-set statistics	128
clear oam ethernet connectivity-fault-management linktrace path-database	129
clear oam ethernet connectivity-fault-management policer	130
clear oam ethernet connectivity-fault-management statistics	131
clear oam ethernet link-fault-management state	132
clear oam ethernet link-fault-management statistics	133
clear protection-group ethernet-ring statistics	134
ping ethernet	135
request interface (revert | switchover) (Aggregated Ethernet Link Protection)	137
request lacp link-switchover	138
show interfaces (Aggregated Ethernet)	139
show interfaces (far-end-interval)	149
show interfaces (Fast Ethernet)	151
show interfaces (Gigabit Ethernet)	168
show interfaces (10-Gigabit Ethernet)	189
show interfaces interface-set (Ethernet Interface Set)	212
show interfaces interface-set queue	214
show interfaces diagnostics optics (Gigabit Ethernet and 10-Gigabit Ethernet)	222
show interfaces irb	240
show lacp interfaces	246
show interfaces mac-database (Gigabit Ethernet)	250
show interfaces mc-ae	254
show oam ethernet connectivity-fault-management delay-statistics	255
show oam ethernet connectivity-fault-management forwarding-state	258
show oam ethernet connectivity-fault-management interfaces	262
show oam ethernet connectivity-fault-management mep-database	269
show oam ethernet connectivity-fault-management mep-statistics	276
show oam ethernet connectivity-fault-management mip	280
show oam ethernet connectivity-fault-management linktrace path-database	281
show oam ethernet connectivity-fault-management path-database	283
show oam ethernet connectivity-fault-management policer	285
show oam ethernet evc	288
show oam ethernet link-fault-management	289
show oam ethernet lmi	294
show oam ethernet lmi statistics	296
show protection-group ethernet-ring aps	298
show protection-group ethernet-ring data-channel	300
show protection-group ethernet-ring interface	302
show protection-group ethernet-ring node-state	304

	show protection-group ethernet-ring statistics	306
	show protection-group ethernet-ring vlan	308
	traceroute ethernet	310
Chapter 5	VRRP Operational Mode Commands	313
	clear vrrp	314
	show vrrp	315
Part 3	Digital Transmission Interfaces	
Chapter 6	Digital Transmission Interface Operational Mode Commands	327
	show interfaces (T1 or E1)	328
	show interfaces (T3 or E3)	347
Part 4	IP Demux Interfaces	
Chapter 7	IP Demux Interface Operational Mode Commands	367
	show interfaces demux0 (Demux Interfaces)	368
Part 5	PPP and PPPoE Interfaces	
Chapter 8	PPP Interface Operational Mode Commands	377
	clear ppp statistics	378
	show ppp address-pool	379
	show ppp interface	381
	show ppp statistics	389
	show ppp summary	395
Chapter 9	PPPoE Interface Operational Mode Commands	397
	clear pppoe sessions	399
	clear pppoe statistics	400
	show interfaces (PPPoE)	401
	show pppoe interfaces	411
	show pppoe service-name-tables	415
	show pppoe sessions	417
	show pppoe statistics	419
	show pppoe underlying-interfaces	421
	show pppoe version	424
Part 6	Serial Interfaces	
Chapter 10	Serial Interface Operational Mode Commands	427
	show interfaces (Serial)	428
Part 7	Optical Interfaces	
Chapter 11	SONET/SDH Interface Operational Mode Commands	443
	show aps	444
	show interfaces (Aggregated SONET/SDH)	448
	show interfaces (SONET/SDH)	455
	show interfaces diagnostics optics (SONET)	483

Part 8	ATM Interfaces	
Chapter 12	ATM Interface Operational Mode Commands	495
	show interfaces (ATM)	496
	show interfaces (ATM-over-ADSL)	529
	show interfaces (ATM-over-SHDSL)	537
Chapter 13	ILMI Interface Operational Mode Commands	545
	clear ilmi statistics	546
	show ilmi	547
	show ilmi statistics	548
Part 9	ISDN Interfaces	
Chapter 14	ISDN Interface Operational Mode Commands	553
	clear isdn q921 statistics	555
	clear isdn q931 statistics	556
	show dialer defaults	557
	show dialer interfaces	559
	show dialer pools	561
	show interfaces (ISDN B-Channel)	563
	show interfaces (ISDN BRI)	569
	show interfaces (ISDN D-channel)	573
	show interfaces (ISDN Dialer)	579
	show isdn calls	588
	show isdn history	589
	show isdn q921 statistics	590
	show isdn q931 statistics	592
	show isdn status	595
Part 10	Channelized Interfaces	
Chapter 15	Channelized E1 Interface Operational Mode Commands	599
	show interfaces (Channelized E1)	600
	show interfaces (Channelized E1 IQ)	611
	show interfaces controller (Channelized E1 IQ)	615
Chapter 16	Channelized OC Interface Operational Commands	617
	show interfaces (Channelized OC3 IQ and IQE)	618
	show interfaces (Channelized OC12)	637
	show interfaces (Channelized OC12 IQ and IQE)	641
	show interfaces controller (Channelized OC3 IQ and IQE)	645
	show interfaces controller (Channelized OC12 IQ and IQE)	646
Chapter 17	Channelized STM1 Interface Operational Mode Commands	649
	show interfaces (Channelized STM1)	650
	show interfaces (Channelized STM1 IQ)	665
	show interfaces controller (Channelized STM1 IQ)	668

Chapter 18	Channelized T1 and T3 Interface Operational Mode Commands	669
	show interfaces (Channelized DS3-to-DS0)	671
	show interfaces (Channelized DS3-to-DS1)	682
	show interfaces (Channelized T1 IQ)	685
	show interfaces (Channelized T3 IQ)	697
	show interfaces controller (Channelized T1 IQ)	699
	show interfaces controller (Channelized T3 IQ)	700
Part 11	Services Interfaces	
Chapter 19	Adaptive Services Interface Operational Mode Commands	703
	request interface (revert | switchover) (Adaptive Services)	704
	show interfaces (Adaptive Services)	705
	show interfaces (Redundant Adaptive Services)	713
	show interfaces redundancy	715
Chapter 20	Encryption Interface Operational Mode Commands	717
	show interfaces (Encryption)	718
Chapter 21	Flow Collector and Monitoring Interface Operational Mode Commands	725
	show interfaces (Dynamic Flow Capture)	726
	show interfaces (Flow Collector)	730
	show interfaces (Flow Monitoring)	736
Chapter 22	Link Services Interface Operational Mode Commands	741
	show interfaces (Link Services)	742
	show interfaces (Link Services IQ)	755
	show interfaces (Multilink Services)	771
	show interfaces (Redundant Link Services IQ)	779
Chapter 23	Tunnel Services Interface Operational Mode Commands	793
	show interfaces (GRE)	794
	show interfaces (IP-over-IP)	800
	show interfaces (Logical Tunnel)	805
	show interfaces (Multicast Tunnel)	810
	show interfaces (PIM)	814
	show interfaces (Virtual Loopback Tunnel)	818
Chapter 24	VoIP Interface Operational Mode Commands	823
	clear tgm fpc	824
	request tgm login fpc	825
	set tgm fpc	826
	show interfaces (TGM550 Module)	827
	show tgm dynamic-call-admission-control	834
	show tgm fpc	835
	show tgm telephony-interface-module status	836

Part 12	Management Interfaces	
Chapter 25	Discard Interface Operational Mode Commands	839
	show interfaces (Discard)	840
Chapter 26	Loopback Interface Operational Mode Commands	845
	show interfaces (Loopback)	846
Chapter 27	Management Ethernet and Internal Ethernet Interface Operational Mode Commands	853
	show interfaces (M Series and T Series Router Management and Internal Ethernet)	855
	show interfaces (J Series Router Management Ethernet)	869
Part 13	Index	
	Index	883
	Index of Statements and Commands	893

About This Guide

This preface provides the following guidelines for using the *Junos[®] OS Interfaces Command Reference*:

- Junos Documentation and Release Notes on page xvii
- Objectives on page xvii
- Audience on page xviii
- Supported Platforms on page xix
- Using the Indexes on page xix
- Documentation Conventions on page xix
- Documentation Feedback on page xxi
- Requesting Technical Support on page xxi

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If the information in the latest release notes differs from the information in the documentation, follow the *Junos Release Notes*.

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Juniper Networks supports a technical book program to publish books by Juniper Networks engineers and subject matter experts with book publishers around the world. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration using the Junos operating system (Junos OS) and Juniper Networks devices. In addition, the Juniper Networks Technical Library, published in conjunction with O'Reilly Media, explores improving network security, reliability, and availability using Junos OS configuration techniques. All the books are for sale at technical bookstores and book outlets around the world. The current list can be viewed at <http://www.juniper.net/books>.

Objectives

This reference provides descriptions of the Juniper Networks Junos OS 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 OS System Basics and Services Command Reference*
- *Junos OS Routing Protocols and Policies Command Reference*



NOTE: For additional information about Junos OS—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 OS Network Interfaces Configuration Guide*—Includes configuration statements for all router interfaces.
- *Junos OS 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, Junos OS 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 xx 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 configure 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 <i>domain-name</i>
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

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

Convention	Description	Examples
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 .

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 or topic name
- URL or page number
- Software release version (if applicable)

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/us/en/local/pdf/resource-guides/7100059-en.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/>
- 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: <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 23
- Common Output Fields on page 111

CHAPTER 1

Interface Types

This chapter provides information about the following topics:

- Interface Naming Conventions on page 3
- Discard Interface on page 7
- Loopback Interface on page 7
- Management Ethernet and Internal Ethernet Interfaces on page 7
- 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 22

Interface Naming Conventions

- 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

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

M Series and T Series Router Interface Names

On M Series and T Series router, 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 Router Interface Names

On 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 routers use DPCs, command syntax in this book is shown as *fpc/pic/port* for simplicity.

J Series Interface Names

On J Series routers, 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 routers:

type-fpc/pic/port.logical

- J Series routers:

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 routers:

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

- J Series routers

```
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 3 on page 5 lists the available wildcard characters. You must enclose all wildcard characters except the asterisk (*) in quotation marks ("").

Table 3: Wildcard Characters for Specifying Interface Names

Wildcard Character	Description
* (asterisk)	Match any string of characters in that position in the interface name. For example, so* matches all SONET/SDH interfaces.
"[character<character...>]"	Match one or more individual characters in that position in the interface name. For example, so-"[03]"* matches all SONET/SDH interfaces in slots 0 and 3.
"[!character<character...>]"	Match all characters except the ones included in the brackets. For example, so-"[!03]"* matches all SONET/SDH interfaces except those in slots 0 and 3.
"[character1-character1character2]"	Match a range of characters. For example, so-"[0-3]"* 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, so-"[!0-3]"* 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 user@host> show interfaces terse so*
(SONET/SDH           Interface Admin Link Proto Local Remote
Interfaces)          so-1/0/0      up    up
so-1/0/0.0           up    up    inet  192.168.8.192  --> 192.168.2.250
                        iso
so-1/1/0             up    down
so-1/1/0.0           up    down inet  192.168.8.109/30
                        iso
so-1/1/1             up    up
so-1/1/1.0           up    down inet  192.168.8.113/30
                        iso
                        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
                        iso
                        mpls
so-5/0/1             down down
so-5/0/2             up    down
...

```

```

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

```

```

show interfaces terse user@host> show interfaces terse ["sg"]*
(All Interface Types Interface Admin Link Proto Local Remote
Starting with "S" or  so-1/0/0      up    up
"G")                  so-1/0/0.0   up    up    inet  192.168.2.125  --> 192.168.2.250
                        iso
so-1/1/0             up    down
so-1/1/0.0           up    down inet  192.168.2.150/30
                        iso
so-1/1/1             up    up
so-1/1/1.0           up    down inet  192.168.2.175/30
                        iso
                        mpls
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.

Related Documentation

- [show interfaces \(Discard\) on page 840](#)

Loopback Interface

The Junos OS 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 router control traffic.

Related Documentation

- [show interfaces \(Loopback\) on page 846](#)

Management Ethernet and Internal Ethernet Interfaces

- [Management Ethernet and Internal Ethernet Interfaces \(M Series, MX Series, T Series\) on page 7](#)
- [J Series Management Ethernet Interface on page 9](#)

Management Ethernet and Internal Ethernet Interfaces (M Series, MX Series, T Series)

- [Management Ethernet and Internal Ethernet Interfaces Overview \(M Series, MX Series, T Series\) on page 7](#)
- [TX Matrix Plus and T1600 Router \(Routing Matrix\) Management Ethernet Interfaces on page 8](#)
- [TX Matrix Plus Router Internal Ethernet Interfaces on page 8](#)
- [T1600 Routers \(Routing Matrix\) Internal Ethernet Interfaces on page 9](#)

Management Ethernet and Internal Ethernet Interfaces Overview (M Series, MX Series, T Series)

The M Series and T Series routers have both a management Ethernet interface and one or two internal Ethernet interfaces.

The Junos OS automatically creates the router'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 OS also creates the internal Ethernet interface, **fxp1**, which connects the Routing Engine (**re0**) to the Packet Forwarding Engine. If the router 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
...
```

TX Matrix Plus and T1600 Router (Routing Matrix) Management Ethernet Interfaces

For Juniper Networks TX Matrix Plus Routers and for T1600 Core Routers configured in a routing matrix, the Junos OS automatically creates the router's management Ethernet interface, **em0**. To use **em0** as a management port, you must configure its logical port, **em0.0**, with a valid IP address.

When you enter the **show interfaces** command on a TX Matrix Plus router, the management Ethernet interfaces (and logical interfaces) are displayed:

```
user@host> show interfaces ?
...
em0
em0.0
...
```



NOTE: The Routing Engines in the TX Matrix Plus router and in the T1600 routers configured in a routing matrix do not support the management Ethernet interface **fxp0**, or the internal Ethernet interfaces **fxp1** or **fxp2**.

TX Matrix Plus Router Internal Ethernet Interfaces

On a TX Matrix Plus router, the Routing Engine (RE-TXP-SFC) and Control Board (TXP-CB) function as a unit, or host subsystem. For each host subsystem in the router, the Junos OS automatically creates two internal Ethernet interfaces, **ixgbe0** and **ixgbe1**, for the two 10-Gigabit Ethernet ports on the Routing Engine.

When you enter the **show interfaces** command on a TX Matrix Plus router, the internal Ethernet interfaces (and logical interfaces) are displayed:

```
user@host> show interfaces ?
...
ixgbe0
ixgbe0.0
ixgbe1
ixgbe1.0
...
```

T1600 Routers (Routing Matrix) Internal Ethernet Interfaces

On a T1600 router configured in a routing matrix, the Routing Engine (RE-TXP-LCC) and Control Board (LCC-CB) function as a unit, or host subsystem. For each host subsystem in the router, the Junos OS automatically creates two internal Ethernet interfaces, **bcm0** and **em1**, for the two Gigabit Ethernet ports on the Routing Engine.

For more information about the management Ethernet interface and internal Ethernet interfaces on a TX Matrix Plus router and T1600 routers configured in a routing matrix, see the *Junos Network Interfaces Configuration Guide*.

J Series Management Ethernet Interface

The Junos OS automatically creates the router'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 OS internally generates the nonconfigurable interfaces described in Table 4 on page 10.



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

Table 4: Nonconfigurable Interfaces

Syntax	Description	Related Configurable Tunnel Interface
gre	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> .	gr-fpc/pic/port/ gr-pim/O/port
ipip	IP over IP (IP-IP) interface.	ip-fpc/pic/port ip-pim/O/port
lsi	Label-switched interface. In the system, each label-switched path (LSP) is treated as an interface.	—
mtun	Multicast tunnel interface.	mt-fpc/pic/port mt-pim/O/port
pimd	PIM de-encapsulation interface.	pd-fpc/pic/port port pd-pim/O/port
pime	PIM encapsulation interface.	pe-fpc/pic/port pe-pim/O/port
tap	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 routers, physical interfaces are installed on PICs and use the syntax **type-fpc/pic/port**. On J Series routers, physical interfaces are installed on PIMs and use the syntax **type-pim/O/port**. Physical interfaces are described in the following sections:

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

M Series and T Series Router Physical Interfaces

Table 5 on page 11 lists the physical interfaces that are supported on the M Series and T Series routers.

Table 5: M Series and T Series Router 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 5: M Series and T Series Router 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> <i>xe-fpc/pic/port</i>	Gigabit Ethernet 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 5: M Series and T Series Router Physical Interfaces (*continued*)

Physical Interface	Syntax	PIC
T1	t1-<i>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	t3-<i>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 Router Physical Interfaces

Table 6 on page 13 lists the physical interfaces that are supported on the MX Series routers.

Table 6: MX Series Router Physical Interfaces

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

J Series Router Physical Interfaces

Table 7 on page 14 lists the physical interfaces that are supported on the J Series routers.

Table 7: J Series Router 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 ()	<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
T1	<i>t1-pim/0/port</i>	Dual-Port T1
T3	<i>t3-pim/0/port</i>	T3 (all)



NOTE: ADSL interfaces and SHDSL interfaces are supported on the J Series routers only. Both interfaces are configured over an underlying ATM interface. For more information, see *ATM Interface Operational Mode Commands*.



NOTE: Point-to-Point Protocol over Ethernet (PPPoE) interfaces (pp0) are supported on the J Series routers and the M120 router only. A PPPoE interface is configured over an underlying Ethernet interface. For more information, see *PPPoE Interface Operational Mode Commands*.

Logical Interfaces Assigned to a Logical System

- Logical Systems Overview on page 15
- Logical System Configuration Overview on page 16
- Scope of Logical System Administration on page 16
- Example: show interfaces terse on page 17

Logical Systems Overview

With Junos OS, 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 OS 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 OS 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 routers, services interfaces are installed on PICs. On J Series routers, 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 8 on page 20 lists the services interfaces that are supported on M Series and T Series routers.

Table 8: M Series and T Series Services Interfaces

Interface	Syntax	PIC
Adaptive services	sp-fpc/pic/port	Adaptive Services MultiServices
Generic routing encapsulation (GRE)	gr-fpc/pic/port	Adaptive Services Link Services MultiServices Tunnel Services
IP-over-IP encapsulation tunnel	ip-fpc/pic/port	Adaptive Services Link Services MultiServices Tunnel Services

Table 8: M Series and T Series Services Interfaces (*continued*)

Interface	Syntax	PIC
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
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

Table 8: M Series and T Series Services Interfaces (*continued*)

Interface	Syntax	PIC
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 9 on page 22 lists the services interfaces that are supported on J Series routers.

Table 9: J Series Router 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>
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 10: Container Interfaces

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

CHAPTER 2

Common Interface Commands

Table 11 on page 23 summarizes common **clear interfaces** and **show interfaces** commands used to monitor and troubleshoot most interface types. Commands are listed in alphabetical order.

Table 11: Common Interface Commands

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

Table 11: Common Interface Commands (*continued*)

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



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	clear interfaces interval <i>interface-name</i>
Release Information	Command introduced before Junos OS 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 show interfaces interval command, but not an SNMP query.
Options	<i>interface-name</i> —Name of a particular interface.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show interfaces interval on page 48
List of Sample Output	clear interfaces interval on page 25
Output Fields	See show interfaces interval for an explanation of output fields.
clear interfaces interval	<p>The following example displays the output for a T3 interface before and after the clear interfaces command is entered:</p> <pre> 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 </pre>

```
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 OS 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	all—Set statistics on all interfaces to zero. <i>interface-name</i> —Set statistics on a particular interface to zero.
Required Privilege Level	clear
List of Sample Output	clear interfaces statistics on page 27
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 OS 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 28
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 OS 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 29 show interfaces brief (Encryption) on page 30 show interfaces brief (Gigabit Ethernet) on page 30
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, Auto-negotiation: Enabled,
 Speed-negotiation: Enabled, Auto-MDIX: Enabled
 Remote fault: Online
 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 OS 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 31
Output Fields	Table 12 on page 31 lists the output fields for the show interfaces description command. Output fields are listed in the approximate order in which they appear.

Table 12: 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 OS Release 7.4. all option introduced in Junos OS 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 OS Network Interfaces Configuration Guide</i> .
Required Privilege Level	view
List of Sample Output	show interfaces destination-class all on page 34
Output Fields	Table 13 on page 33 lists the output fields for the show interfaces destination-class command. Output fields are listed in the approximate order in which they appear.

Table 13: 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 destination-class all
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) (
      silver                  0              0
      (                       0) (
Logical interface so-0/1/3.0
      Destination class      Packets      Bytes
                             (packet-per-second) (bits-per-second)
      gold                   0              0
      (                       0) (
      silver                  0              0
      (                       0) (
```


show interfaces detail

Syntax	show interfaces detail
Release Information	Command introduced before Junos OS 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 35
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 the “Destination Class Field” section and the “Source Class Field” section under “Common Output Fields Description” on page 111. For sample output for specific interfaces, see the other chapters in this manual.
show interfaces detail (SONET)	<pre> 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, mpls: 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 </pre>


```

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 OS Release 7.4.
Description	Display extensive information about all interfaces configured on the router.
	<div>  <p>NOTE: At some times, the cumulative byte counters displayed with the <code>show interfaces extensive</code> command on the Trio 10-Gigabit Ethernet MPC with SFP+ is not always increasing and cumulative and does not give the correct results. There is a time lag in collecting these statistics, during which the display might decrease or go from a non-zero number to zero. Eventually, the counter will display the correct result.</p> </div>
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	<p><code>show interfaces extensive</code> (Circuit Emulation) on page 37</p> <p><code>show interfaces extensive</code> (Fast Ethernet) on page 38</p> <p><code>show interfaces extensive</code> (Gigabit Ethernet) on page 40</p> <p><code>show interfaces extensive</code> (IQ2 and IQ2E) on page 40</p> <p><code>show interfaces extensive</code> (100-Gigabit Ethernet) on page 43</p>
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 the “Destination Class Field” section and the “Source Class Field” section under “Common Output Fields Description” on page 111. For sample output for specific interfaces, see the other chapters in this manual.
show interfaces extensive (Circuit Emulation)	<p>If a Circuit Emulation (CE) PIC is configured for SAToP pseudowire, then pseudowire statistics are displayed in the CE info section of the show interface extensive output. If SAToP pseudowire is not configured on the CE PIC, then all the CE info counters will be displayed as 0 (zero).</p>

```

user@host> show interface t1-0/0/0 extensive
Physical interface :t1-0/0/0, Enabled, Physical Link : Up
  Interface index:61441
  Speed : 1.54 Mbps, Loopback: Disabled
  Operational state : Enabled,   Encapsulation : Trans
  Encoding : b8zs,      Framing : unframe,   Build-out : 0-30
  Inversion : enable,   Clock source : master
  Description :
  Traffic statistics:
    T1 media:           Seconds
    ES                  1643
    SES                 1643

```

CE Info	Packets	Bytes
CE Rx :	2395529	306627712
CE Tx :	2396259	306721152
CE Rx Drop:	0	0
CE Tx Drop:	0	0

CE Overrun Events: 0
CE Underrun Events: 0

show interfaces
extensive
(Fast Ethernet)

```

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
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 information:
  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

                                Packets          Bytes
Destination class      (packet-per-second)  (bits-per-second)
  silv1_new             0                      0
    (                    0) (
  silv2_new             0                      0
    (                    0) (
  silv_misc             0                      0
    (                    0) (
  silver0               0                      0
    (                    0) (
  silver2               0                      0
    (                    0) (
  silver3               0                      0
    (                    0) (
  silver4               0                      0
    (                    0) (
  silver5               0                      0
    (                    0) (
  silver6               0                      0
    (                    0) (
  silver7               0                      0
    (                    0) (
  silver9               0                      0
    (                    0) (

                                Packets          Bytes
Source class           (packet-per-second)  (bits-per-second)
  gold1                 0                      0
    (                    0) (
  gold2                 16600                  1062400
    (                    0) (
  gold3                 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
extensive (Gigabit
Ethernet)**

user@host> show interfaces ge-5/0/0.0 extensive

```
Logical interface ge-5/0/0.0 (Index 71) (SNMP ifIndex 1930) (Generation 139)
Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
Traffic statistics:
  Input bytes : 0
  Output bytes : 42
  Input packets: 0
  Output packets: 1
Local statistics:
  Input bytes : 0
  Output bytes : 42
  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
Output Filters: f-any
Protocol inet, MTU: 1500, Generation: 155, Route table: 0
  Output Filters: f-inet,
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.11.1/24, Local: 10.11.1.1, Broadcast: 10.11.1.255,
    Generation: 170
Protocol multiservice, MTU: Unlimited, Generation: 156, Route table: 0
Flags: Is-Primary
Policer: Input: __default_arp_policer__
```

**show interfaces
extensive (IQ2 and
IQ2E)**

user@host> show interfaces ge-3/2/2 extensive

```
Physical interface: ge-3/2/2, Enabled, Physical link is Up
  Interface index: 156, SNMP ifIndex: 548, Generation: 159
  Link-level type: Ethernet, MTU: 1518, Speed: 1000Mbps, BPDU Error: None,
  MAC-REWRITE Error: None, 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 : 8 supported, 8 maximum usable queues
  Schedulers : 128
  Hold-times : Up 0 ms, Down 0 ms
  Current address: 00:14:f6:12:86:fa, Hardware address: 00:14:f6:12:86:fa
  Last flapped : 2010-03-17 04:03:11 PDT (00:45:30 ago)
  Statistics last cleared: Never
Traffic statistics:
  Input bytes : 1716096 0 bps
  Output bytes : 1716448 0 bps
  Input packets: 13407 0 pps
  Output packets: 13411 0 pps
IPv6 total statistics:
  Input bytes : 1716096
  Output bytes : 1716096
  Input packets: 13407
  Output packets: 13407
Ingress traffic statistics at Packet Forwarding Engine:
  Input bytes : 1716096 0 bps
  Input packets: 13407 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: 1, 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: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped
packets
0 0 best-effort      13407      13407
0 1 expedited-fo      0      0
0 2 assured-forw      0      0
0 3 network-cont      0      0
0
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped
packets
0 0 best-effort      13407      13407
0 1 expedited-fo      0      0
0 2 assured-forw      0      0
0 3 network-cont      4      4
0
Active alarms : None
Active defects : None
MAC statistics:
Total octets      1716096      1716448
Total packets      13407      13411
Unicast packets      13407      13407
Broadcast packets      0      0
Multicast packets      0      4
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      13407
Input packet rejects      0
Input DA rejects      0
Input SA rejects      0
Output packet count      13411
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: None, Remote fault: OK

```

```

    Local resolution:
      Flow control: Symmetric, Remote fault: Link OK
    Packet Forwarding Engine configuration:
      Destination slot: 3
    CoS information:
      Direction : Output
      CoS transmit queue      Bandwidth      Buffer Priority
Limit
      0 best-effort          95      950000000    95      0      low
none
      3 network-control      5      500000000    5      0      low
none
      Direction : Input
      CoS transmit queue      Bandwidth      Buffer Priority
Limit
      0 best-effort          95      950000000    95      0      low
none
      3 network-control      5      500000000    5      0      low
none

    Logical interface ge-3/2/2.0 (Index 83) (SNMP ifIndex 6080) (Generation
148)
      Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.100 ] Encapsulation: ENET2
    Traffic statistics:
      Input bytes : 0
      Output bytes : 336
      Input packets: 0
      Output packets: 4
    IPv6 total statistics:
      Input bytes : 1716096
      Output bytes : 1716096
      Input packets: 13407
      Output packets: 13407
    Local statistics:
      Input bytes : 0
      Output bytes : 336
      Input packets: 0
      Output packets: 4
    Transit statistics:
      Input bytes : 0 0 bps
      Output bytes : 0 0 bps
      Input packets: 0 0 pps
      Output packets: 0 0 pps
    IPv6 total statistics:
      Input bytes : 1716096
      Output bytes : 1716096
      Input packets: 13407
      Output packets: 13407
    Protocol inet6, MTU: 1500, Generation: 159, Route table: 0
      Flags: Is-Primary
      Addresses, Flags: Is-Default Is-Primary
      Destination: Unspecified, Local: 2000::2
    Generation: 146
      Addresses, Flags: Is-Preferred
      Destination: fe80::/64, Local: fe80::214:f600:6412:86fa
    Protocol multiservice, MTU: Unlimited, Generation: 148
    Generation: 160, Route table: 0
      Policer: Input: __default_arp_policer__

```



```

Logical interface ge-3/2/2.32767 (Index 84) (SNMP ifIndex 6081) (Generation
149)
  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
  Protocol multiservice, MTU: Unlimited, Generation: 161, Route table: 0
  Flags: None
  Policer: Input: __default_arp_policer__

```

**show interfaces
extensive (100-Gigabit
Ethernet)**

```

user@host> show interfaces et-0/0/0:0 extensive
Physical interface: et-0/0/0:0, Enabled, Physical link is Down
  Interface index: 156, SNMP ifIndex: 516, Generation: 163
  Link-level type: Ethernet, MTU: 9192, Speed: 50000mbps, BPDU Error: None,
  MAC-REWRITE Error: None,
  Loopback: Disabled, Source filtering: Disabled, Flow control: Enabled
  Device flags : Present Running Down
  Interface flags: Hardware-Down 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:aa:aa:aa:aa:00, Hardware address: 00:21:59:5c:48:00
  Last flapped : 2010-01-07 16:36:49 PST (18:02:35 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: 0, 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, 8 in use
  Queue counters: Queued packets Transmitted packets Dropped packets

    0 DEFAULT, NC- 0 0 0
    1 REALTIME 0 0 0

```

2	PRIVATE, NC-	0	0	0
3	CONTROL	1253	1253	0
4	BC-H, CLASS_	0	0	0
5	BC-M, CLASS_	0	0	0
6	IA, CLASS_V_	0	0	0
7	CLASS_S_OUTP	0	0	0

Queue Mapped Forwarding Class

0	DEFAULT, NC-Q0
1	REALTIME
2	PRIVATE, NC-Q1
3	CONTROL
4	BC-H, CLASS-Q4
5	BC-M, CLASS-Q5
6	IA, CLASS_V_OUTPUT
7	CLASS_S_OUTPUT

Active alarms : None

Active defects : None

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	0
Jabber frames	0	0
Fragment frames	0	0
VLAN tagged frames	0	0
Code violations	0	0

Packet Forwarding Engine configuration:

Destination slot: 0

CoS information:

Direction : Output

CoS transmit queue	Bandwidth		Buffer Priority Limit	
	%	bps	%	usec
0 best-effort	95	47500000000	95	0
3 network-control	5	2500000000	5	0

Logical interface et-0/0/0:0.0 (Index 68) (SNMP ifIndex 546) (Generation 161)

Flags: Deviet-Down SNMP-Traps 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
Protocol inet, MTU: 9178, Generation: 220, Route table: 0
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 210.160.0/24, Local: 210.160.0.1, Broadcast: 210.160.0.255,
Generation: 192
Protocol mpls, MTU: 9166, Maximum labels: 3, Generation: 221, Route table: 0

Protocol multiservice, MTU: Unlimited, Generation: 222, Route table: 0
  Policer: Input: __default_arp_policer
```

show interfaces filters

Syntax	show interfaces filters <interface-name>
Release Information	Command introduced before Junos OS 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 OS Policy Framework Configuration Guide</i> . For related operational mode commands, see the <i>Junos OS Routing Protocols and Policies Command Reference</i> .
Required Privilege Level	view
List of Sample Output	show interfaces filters on page 47 show interfaces filters interface-name on page 47
Output Fields	Table 14 on page 46 lists the output fields for the show interfaces filters command. Output fields are listed in the approximate order in which they appear.

Table 14: 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			
ge-5/0/0	up	up				
ge-5/0/0.0	up	up	any			f-any
			inet			f-inet
			multiservice			
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
interface-name**

user@host> show interfaces filters so-2/1/0

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 OS 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> —(Optional) Name of a particular interface.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show interfaces interval on page 48
List of Sample Output	show interfaces interval (Channelized OC12) on page 49 show interfaces interval (E3) on page 49 show interfaces interval (SONET/SDH) on page 49
Output Fields	Table 15 on page 48 lists the output fields for the show interfaces interval command. Output fields are listed in the approximate order in which they appear.

Table 15: 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 interface-type media 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 OS 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 50
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> <pre> 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) </pre>


```
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 OS 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 53 show interfaces policers interface-name on page 53
Output Fields	Table 16 on page 52 lists the output fields for the show interfaces policers command. Output fields are listed in the approximate order in which they appear.

Table 16: 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 user@host> show interfaces policers
policers
Interface      Admin Link Proto Input Policer      Output Policer
ge-0/0/0       up    up    inet so-2/0/0-in-policer so-2/0/0-out-policer
ge-0/0/0.0     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-in-policer so-2/0/0-out-policer
so-2/0/0.0     up    up    iso
so-2/1/0       up    down
...

show interfaces user@host> show interfaces policers so-2/1/0
policers
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-in-policer so-2/1/0-out-policer
so-2/1/0.0     up    down iso
so-2/1/0.0     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	Command introduced before Junos OS Release 7.4. both-ingress-egress , egress , and ingress options introduced in Junos OS Release 7.6.
Description	Display class-of-service (CoS) queue information for physical interfaces.
Options	<p>none—Show detailed CoS queue statistics for all physical interfaces.</p> <p>aggregate—(Optional) Display the aggregated queuing statistics of all logical interfaces that have traffic-control profiles configured.</p> <p>both-ingress-egress—(Optional) On Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs, display both ingress and egress queue statistics.</p> <p>egress—(Optional) Display egress queue statistics.</p> <p>forwarding-class forwarding-class—(Optional) Forwarding class name for this queue. Shows detailed CoS statistics for the queue associated with the specified forwarding class.</p> <p>ingress—(Optional) On Gigabit Ethernet IQ2 PICs, display ingress queue statistics.</p> <p>interface-name interface-name—(Optional) Show detailed CoS queue statistics for the specified interface.</p> <p>remaining-traffic—(Optional) Display the queuing statistics of all logical interfaces that do not have traffic-control profiles configured.</p>
Additional Information	<p>On M Series routers (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 routers 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 show interfaces statistics 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 the 4-port Channelized OC12 IQE PIC and 1-port Channelized OC48 IQE PIC, the **Packet Forwarding Engine Chassis Queues** field represents traffic bound for a particular physical interface on the PIC. For all other PICs, the **Packet Forwarding Engine Chassis Queues** field represents the total traffic bound for the PIC.

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 OS Network Interfaces Configuration Guide*. For related CoS operational mode commands, see the *Junos OS 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 59
- show interfaces queue (Fast Ethernet on a J4300 Router)** on page 60
- show interfaces queue (Gigabit Ethernet on a T640 Router)** on page 61
- show interfaces queue aggregate (Gigabit Ethernet Enhanced DPC)** on page 62
- show interfaces queue (Gigabit Ethernet IQ2)** on page 65
- show interfaces queue both-ingress-egress (Gigabit Ethernet IQ2)** on page 68
- show interfaces queue ingress (Gigabit Ethernet IQ2)** on page 70
- show interfaces queue egress (Gigabit Ethernet IQ2)** on page 71
- show interfaces queue remaining-traffic (Gigabit Ethernet Enhanced DPC)** on page 73
- show interfaces queue (Channelized OC12 IQE Type 3 PIC in SONET Mode)** on page 75

Output Fields Table 17 on page 55 lists the output fields for the **show interfaces queue** command. Output fields are listed in the approximate order in which they appear.

Table 17: 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 the "Enabled Field" section under "Common Output Fields Description" on page 111.
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.

Table 17: show interfaces queue Output Fields (*continued*)

Field Name	Field Description
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.
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.
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.
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	<p>Number of packets queued to this queue.</p> <p>NOTE: For Gigabit Ethernet IQ2 interfaces, the Queued Packets count is calculated by the Junos OS interpreting one frame buffer as 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 18 on page 58.
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 18 on page 58.
Tail-dropped packets	Number of packets dropped because of tail drop.

Table 17: 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 routers only) On M320 and M120 routers and the T Series routers, 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 routers 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 18 on page 58.</p> <ul style="list-style-type: none"> (M Series and T Series routers only) On M320 and M120 routers and the T Series routers, 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 routers 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 18 on page 58 shows how the byte counts on the outbound interfaces vary depending on the PIC type. Table 18 on page 58 is based on the assumption that outbound interfaces are sending IP traffic with 478 bytes per packet.

Table 18: Byte Count by PIC Type

PIC Type	Output Level	Byte Count Includes	Comments
Gigabit Ethernet IQ and IQE PICs	Interface	<p>Queued: 490 bytes per packet, representing 478 bytes of Layer 3 packet + 12 bytes</p> <p>Transmitted: 490 bytes per packet, representing 478 bytes of Layer 3 packet + 12 bytes</p> <p>RED dropped: 496 bytes per packet representing 478 bytes of Layer 3 packet + 18 bytes</p>	<p>The 12 additional bytes include 6 bytes for the destination MAC address + 4 bytes for the VLAN + 2 bytes for the Ethernet type.</p> <p>For RED dropped, 6 bytes are added for the source MAC address.</p>
	Packet forwarding component	<p>Queued: 478 bytes per packet, representing 478 bytes of Layer 3 packet</p> <p>Transmitted: 478 bytes per packet, representing 478 bytes of Layer 3 packet</p>	—
Non-IQ PIC	Interface	<p>Queued: 478 bytes of Layer 3 packet + the full Layer 2 overhead.</p> <p>Transmitted: 478 bytes of Layer 3 packet + the full Layer 2 overhead.</p>	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	<p>Queued: 482 bytes per packet, representing 478 bytes of Layer 3 packet + 4 bytes</p> <p>Transmitted: 482 bytes per packet, representing 478 bytes of Layer 3 packet + 4 bytes</p> <p>RED dropped: 482 bytes per packet, representing 478 bytes of Layer 3 packet + 4 bytes</p>	The additional 4 bytes are for the Layer 2 Point-to-Point Protocol (PPP) header.
	Packet forwarding component	<p>Queued: 478 bytes per packet, representing 478 bytes of Layer 3 packet</p> <p>Transmitted: 486 bytes per packet, representing 478 bytes of Layer 3 packet + 8 bytes</p>	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	<p>Queued: 478 bytes per packet, representing 478 bytes of Layer 3 packet</p> <p>Transmitted: 483 bytes per packet, representing 478 bytes of Layer 3 packet + 5 bytes</p> <p>RED dropped: 478 bytes per packet, representing 478 bytes of Layer 3 packet</p>	For transmitted packets, the additional 5 bytes includes 4 bytes for the PPP header and 1 byte for the packet loss priority (PLP).

Table 18: Byte Count by PIC Type (*continued*)

PIC Type	Output Level	Byte Count Includes	Comments
1-port 10 Gigabit Ethernet IQ2 and IQ2-E PICs	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.
4-port 1G IQ2 and IQ2-E PICs	Packet forwarding component	Queued: 478 bytes of Layer 3 packet.	—
8-port 1G IQ2 and IQ2-E PICs		Transmitted: 478 bytes of Layer 3 packet.	

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 :
    Low          :          0          0 pps
    Medium-low   :          0          0 pps
    Medium-high  :          0          0 pps
    High         :          0          0 pps
  RED-dropped bytes :
    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 :
    Low          :          0          0 pps
    Medium-low   :          0          0 pps
    Medium-high  :          0          0 pps
    High         :          0          0 pps
  RED-dropped bytes :
    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 :
    Low          :          0          0 pps
    Medium-low   :          0          0 pps
    Medium-high  :          0          0 pps
    High         :          0          0 pps
  RED-dropped bytes :
    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 queue
(Channelized OC12 IQE
Type 3 PIC in SONET
Mode)

```

user@host> show interfaces queue t3-1/1/0:7
Physical interface: t3-1/1/0:7, Enabled, Physical link is Up

Interface index: 192, SNMP ifIndex: 1948

Description: full T3 interface connect to 6ce13 t3-3/1/0:7 for FR testing -
Lam

Forwarding classes: 16 supported, 9 in use

Egress queues: 8 supported, 8 in use

Queue: 0, Forwarding classes: DEFAULT

Queued:

Packets : 214886 13449 pps

Bytes : 9884756 5164536 bps

Transmitted:

Packets : 214886 13449 pps

Bytes : 9884756 5164536 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: REALTIME

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: PRIVATE

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: 3, Forwarding classes: CONTROL

Queued:

Packets	:	60	0 pps
Bytes	:	4560	0 bps

Transmitted:

Packets	:	60	0 pps
Bytes	:	4560	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: 4, Forwarding classes: CLASS_B_OUTPUT
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: 5, Forwarding classes: CLASS_C_OUTPUT
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: 6, Forwarding classes: CLASS_V_OUTPUT

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: 7, Forwarding classes: CLASS_S_OUTPUT, GETS

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

Packet Forwarding Engine Chassis Queues:

Queues: 8 supported, 8 in use

Queue: 0, Forwarding classes: DEFAULT

Queued:

Packets	:	371365	23620 pps
Bytes	:	15597330	7936368 bps

Transmitted:

Packets	:	371365	23620 pps
Bytes	:	15597330	7936368 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: REALTIME
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: PRIVATE
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: 3, Forwarding classes: CONTROL

Queued:

Packets	:	32843	0 pps
Bytes	:	2641754	56 bps

Transmitted:

Packets	:	32843	0 pps
Bytes	:	2641754	56 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: 4, Forwarding classes: CLASS_B_OUTPUT

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: 5, Forwarding classes: CLASS_C_OUTPUT

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: 6, Forwarding classes: CLASS_V_OUTPUT
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: 7, Forwarding classes: CLASS_S_OUTPUT, GETS
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 routing

Syntax	show interfaces routing <brief | detail> <interface-name> <logical-system (all | <i>logical-system-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display 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 OS differ 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 OS Routing Protocols Configuration Guide</i> . For information about related operational mode commands for routing instances and protocols, see the <i>Junos OS Routing Protocols and Policies Command Reference</i> .
Required Privilege Level	view
List of Sample Output	<p>show interfaces routing brief on page 87</p> <p>show interfaces routing brief (TX Matrix Plus Router) on page 88</p> <p>show interfaces routing detail on page 88</p> <p>show interfaces routing detail (TX Matrix Plus Router) on page 89</p>
Output Fields	Table 19 on page 86 lists the output fields for the show interfaces routing command. Output fields are listed in the approximate order in which they appear.

Table 19: 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

Table 19: show interfaces routing Output Fields (*continued*)

Field Name	Field Description	Level of Output
Refcount	Number of references to the interface in the routing software.	detail
State	State (Up or Down) and type of interface.	detail
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 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	Information about the configuration of protocols on the interface: <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

```

```

so-5/0/1.0      Up      INET  192.168.2.120
                  INET  enabled
                  MPLS  enabled
                  ISO   enabled
                  INET  192.168.2.130
                  INET  enabled
at-1/0/0.3      Up      CCC   enabled
at-1/0/0.2      Up      CCC   enabled
at-1/0/0.0      Up      ISO   enabled
                  INET  192.168.90.10
                  INET  enabled
lo0.0           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 brief (TX Matrix
Plus Router)**

```

user@host> show interfaces routing brief
Interface      State Addresses
...
ge-23/0/4.0    Up      INET  2.9.1.1
                  ISO   enabled
                  MPLS  enabled
ge-23/0/3.0    Up      INET  2.8.1.1
                  ISO   enabled
                  MPLS  enabled
ge-23/0/2.0    Up      INET  2.7.1.1
                  ISO   enabled
                  MPLS  enabled
ge-23/0/1.0    Up      INET  2.6.1.1
                  ISO   enabled
                  MPLS  enabled
ge-23/0/0.0    Up      INET  2.5.1.1
                  ISO   enabled
                  MPLS  enabled
ge-31/0/7.599  Up      INET  2.14.10.93
ge-31/0/7.598  Up      INET  2.14.10.89
ge-31/0/7.597  Up      INET  2.14.10.85
ge-31/0/7.596  Up      INET  2.14.10.81
ge-31/0/7.595  Up      INET  2.14.10.77
ge-31/0/7.594  Up      INET  2.14.10.73
...
ixgbe1.0       Up      INET  10.34.0.4
                  INET  162.0.0.4
                  INET6  fe80::200:1ff:fe22:4
                  INET6  fec0::a:22:0:4
ixgbe0.0       Up      INET  10.34.0.4
                  INET  162.0.0.4
                  INET6  fe80::200:ff:fe22:4
                  INET6  fec0::a:22:0:4
em0.0          Up      INET  192.168.178.11

```

**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 detail (TX
Matrix Plus Router)**

```

user@host> show interfaces routing detail
ge-23/0/4.0
  Index: 77, Refcount: 5, State: <Up Broadcast Multicast> Change: <>
  0 metric, 0 up/down transitions, reth state 0, full-duplex
  Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 1000Mbps
  Link address #0 0.1d.b5.14.da.2d
  INET address 2.9.1.1
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <RT-Change>
    Preference 0, metric 0, MTU 1500 bytes
    Broadcast address 2.9.1.3
    Destination: 2.9.1.0/30
    System flags: <Is-Preferred Is-Primary>
  ISO address (null)
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1497 bytes
    System flags: <>
  MPLS address (null)
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1488 bytes
    System flags: <>
ge-23/0/3.0
  Index: 76, Refcount: 5, State: <Up Broadcast Multicast> Change: <>
  0 metric, 0 up/down transitions, reth state 0, full-duplex
  Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 1000Mbps
  Link address #0 0.1d.b5.14.da.2c
  INET address 2.8.1.1
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <RT-Change>
    Preference 0, metric 0, MTU 1500 bytes
    Broadcast address 2.8.1.3
    Destination: 2.8.1.0/30
    System flags: <Is-Preferred Is-Primary>
  ISO address (null)
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1497 bytes
    System flags: <>
  MPLS address (null)
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1488 bytes
    System flags: <>
ge-23/0/2.0

```

```

Index: 75, Refcount: 5, State: <Up Broadcast Multicast> Change: <>
0 metric, 0 up/down transitions, reth state 0, full-duplex
Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 1000Mbps
Link address #0 0.1d.b5.14.da.2b
INET address 2.7.1.1
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <RT-Change>
  Preference 0, metric 0, MTU 1500 bytes
  Broadcast address 2.7.1.3
  Destination: 2.7.1.0/30
  System flags: <Is-Preferred Is-Primary>
ISO address (null)
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
  Preference 0, metric 0, MTU 1497 bytes
  System flags: <>
MPLS address (null)
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
  Preference 0, metric 0, MTU 1488 bytes
  System flags: <>
ge-23/0/1.0
Index: 74, Refcount: 5, State: <Up Broadcast Multicast> Change: <>
0 metric, 0 up/down transitions, reth state 0, full-duplex
Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 1000Mbps
Link address #0 0.1d.b5.14.da.2a
INET address 2.6.1.1
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <RT-Change>
  Preference 0, metric 0, MTU 1500 bytes
  Broadcast address 2.6.1.3
...
ixgbe1.0
Index: 5, Refcount: 5, State: <Up Broadcast Multicast> Change: <>
0 metric, 0 up/down transitions, reth state 0, full-duplex
Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 1000Mbps
Link address #0 2.0.1.22.0.4
INET address 10.34.0.4
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
  Preference 0, metric 0, MTU 1500 bytes
  Broadcast address 10.255.255.255
  Destination: 10.0.0.0/8
  System flags: <Is-Preferred>
INET address 162.0.0.4
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
  Preference 0, metric 0, MTU 1500 bytes
  Broadcast address 191.255.255.255
  Destination: 128.0.0.0/2
  System flags: <Primary Is-Preferred Is-Primary>
INET6 address fe80::200:1ff:fe22:4
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
  Preference 0, metric 0, MTU 1500 bytes
  Destination: fe80::/64
  System flags: <Is-Preferred>
INET6 address fec0::a:22:0:4
  State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
  Preference 0, metric 0, MTU 1500 bytes
  Destination: fec0::/64
  System flags: <Is-Preferred Is-Primary>
ixgbe0.0
Index: 4, Refcount: 5, State: <Up Broadcast Multicast> Change: <>
0 metric, 0 up/down transitions, reth state 0, full-duplex
Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 1000Mbps
Link address #0 2.0.0.22.0.4
INET address 10.34.0.4

```



```

    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1500 bytes
    Broadcast address 10.255.255.255
    Destination: 10.0.0.0/8
    System flags: <Is-Preferred>
INET address 162.0.0.4
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1500 bytes
    Broadcast address 191.255.255.255
    Destination: 128.0.0.0/2
    System flags: <Primary Is-Default Is-Preferred Is-Primary>
INET6 address fe80::200:ff:fe22:4
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1500 bytes
    Destination: fe80::/64
    System flags: <Is-Preferred>
INET6 address fec0::a:22:0:4
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1500 bytes
    Destination: fec0::/64
    System flags: <Is-Default Is-Preferred Is-Primary>
em0.0
    Index: 3, Refcount: 2, State: <Up Broadcast Multicast> Change: <>
    0 metric, 0 up/down transitions, reth state 0, full-duplex
    Link layer: Ethernet Encapsulation: Ethernet Bandwidth: 100Mbps
    Link address #0 0.80.f9.26.0.c0
    INET address 192.168.178.11
    State: <Up Broadcast Multicast Localup> Change: <> Flags: <>
    Preference 0, metric 0, MTU 1500 bytes
    Broadcast address 192.168.178.127
    Destination: 192.168.178.0/25
    System flags: <Is-Preferred Is-Primary>

```

show interfaces routing summary

Syntax	show interfaces routing summary <interface-name> <logical-system (all | logical-system-name)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display a summary 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 OS differ 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 OS Routing Protocols Configuration Guide</i> . For information about related operational mode commands for routing instances and protocols, see the <i>Junos OS Routing Protocols and Policies Command Reference</i> .
Required Privilege Level	view
List of Sample Output	<p>show interfaces routing summary on page 93</p> <p>show interfaces routing summary (TX Matrix Plus Router) on page 93</p>
Output Fields	Table 20 on page 92 lists the output fields for the show interfaces routing summary command. Output fields are listed in the approximate order in which they appear.

Table 20: 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.

Table 20: show interfaces routing summary Output Fields (*continued*)

Field Name	Field Description
Trans	Number of times the interface has transitioned from Down to Up .
Status	Interface status (Up or Down) and type.

**show interfaces
routing summary**

```
user@host> show interfaces routing 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 summary (TX
Matrix Plus Router)**

```
user@host> show interfaces routing summary
```

```
9 physical interfaces (9 up)
```

```
11 INET protocol addresses (11 up)
```

```
6 MPLS protocol addresses (6 up)
```

```
4 INET6 protocol addresses (4 up)
```

Interface	Index	Metric	Trans.	Status
ge-23/0/8.0	73	0	0	Up Broadcast Multicast
ge-23/0/7.0	72	0	0	Up Broadcast Multicast
ge-23/0/6.0	71	0	0	Up Broadcast Multicast
ge-7/0/9.0	69	0	0	Up Broadcast Multicast
ge-15/0/9.0	70	0	0	Up Broadcast Multicast
xe-6/1/1.0	68	0	0	Up Broadcast Multicast
lo0.16385	66	0	0	Up Broadcast Loopback Multicast
lo0.16384	65	0	0	Up Broadcast Loopback Multicast
lo0.0	64	0	0	Up Broadcast Loopback Multicast
ixgbe1.0	5	0	0	Up Broadcast Multicast
ixgbe0.0	4	0	0	Up Broadcast Multicast
em0.0	3	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 OS 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 94</p> <p>show interfaces routing-instance all on page 94</p> <p>show interfaces routing-instance extensive on page 94</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
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

show interfaces routing-instance all
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

show interfaces routing-instance extensive
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:
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	<code>show interfaces snmp-index <i>snmp-index</i></code>
Release Information	Command introduced before Junos OS 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 <code>show interfaces <i>interface-name</i> detail</code> and the <code>show interfaces <i>interface-name</i> extensive</code> command includes all the information displayed in the output from the <code>show interfaces snmp-index</code> command.
Required Privilege Level	view
List of Sample Output	<code>show interfaces snmp-index</code> on page 96
Output Fields	The output fields from the <code>show interfaces snmp-index <i>snmp-index</i></code> command are identical to those produced by the <code>show interfaces <i>interface-name</i></code> 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 OS Release 7.4. all option introduced in Junos OS 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 OS Network Interfaces Configuration Guide</i> .
Required Privilege Level	view
List of Sample Output	show interfaces source-class all on page 98
Output Fields	Table 21 on page 97 lists the output fields for the show interfaces source-class command. Output fields are listed in the approximate order in which they appear.

Table 21: 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	<code>show interfaces statistics <i>interface-name</i> <detail></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display static interface statistics, such as errors.
Options	<p><i>interface-name</i>—Name of an interface.</p> <p>detail—(Optional) Display detail output.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> clear interfaces statistics on page 27
List of Sample Output	<p>show interfaces statistics (Fast Ethernet) on page 99</p> <p>show interfaces statistics (Gigabit Ethernet PIC—Egress) on page 100</p> <p>show interfaces statistics detail (Aggregated Ethernet) on page 102</p> <p>show interfaces statistics detail (Aggregated Ethernet—Ingress) on page 103</p> <p>show interfaces statistics detail (Aggregated Ethernet—Egress) on page 104</p> <p>show interfaces statistics (SONET/SDH) on page 105</p> <p>show interfaces statistics (Aggregated SONET/SDH—Ingress) on page 106</p> <p>show interfaces statistics (Aggregated SONET/SDH—Egress) on page 107</p>
Output Fields	Output from both the <code>show interfaces <i>interface-name</i> detail</code> and the <code>show interfaces <i>interface-name</i> extensive</code> commands include all the information displayed in the output from the <code>show interfaces statistics</code> command. For more information, see the particular interface type in which you are interested. For information about destination class and source class statistics, see the “Destination Class Field” section and the “Source Class Field” section under “Common Output Fields Description” on page 111.
show interfaces statistics (Fast Ethernet)	<pre> 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) </pre>

Flags: SNMP-Traps Encapsulation: ENET2

Protocol inet, MTU: 1500

Flags: Is-Primary, DCU, SCU-in

Destination class	Packets (packet-per-second)	Bytes (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
(Gigabit Ethernet
PIC—Egress)

user@host> **show interfaces ge-5/2/0 statistics detail**

Physical interface: ge-5/2/0, Enabled, Physical link is Up

Interface index: 146, SNMP ifIndex: 519, Generation: 149

Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, BPDU Error: None,

MAC-REWRITE Error: None, 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, 8 maximum usable queues

Hold-times : Up 0 ms, Down 0 ms

Current address: 00:1d:b5:61:d9:74, Hardware address: 00:1d:b5:61:d9:74

Last flapped : 2009-11-11 11:24:00 PST (09:23:08 ago)

Statistics last cleared: 2009-11-11 17:50:58 PST (02:56:10 ago)

Traffic statistics:

Input bytes :	271524	0 bps
Output bytes :	37769598	352 bps
Input packets:	3664	0 pps
Output packets:	885790	0 pps

IPv6 transit statistics:

Input bytes :	0
Output bytes :	16681118
Input packets:	0
Output packets:	362633

Multicast statistics:

IPv4 multicast statistics:

Input bytes :	112048	0 bps
Output bytes :	20779920	0 bps
Input packets:	1801	0 pps
Output packets:	519498	0 pps

IPv6 multicast statistics:

Input bytes :	156500	0 bps
Output bytes :	16681118	0 bps
Input packets:	1818	0 pps
Output packets:	362633	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

```

Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort      882558      882558      0
  1 expedited-fo      0      0      0
  2 assured-forw      0      0      0
  3 network-cont     3232      3232      0

Active alarms : None
Active defects : None

Logical interface ge-5/2/0.0 (Index 71) (SNMP ifIndex 573) (Generation 135)
Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
Traffic statistics:
  Input bytes :      271524
  Output bytes :    37769598
  Input packets:      3664
  Output packets:    885790
IPv6 transit statistics:
  Input bytes :      0
  Output bytes :    16681118
  Input packets:      0
  Output packets:    362633
Local statistics:
  Input bytes :      271524
  Output bytes :    308560
  Input packets:      3664
  Output packets:    3659
Transit statistics:
  Input bytes :      0      0 bps
  Output bytes :    37461038      0 bps
  Input packets:      0      0 pps
  Output packets:    882131      0 pps
IPv6 transit statistics:
  Input bytes :      0
  Output bytes :    16681118
  Input packets:      0
  Output packets:    362633
Multicast statistics:
IPv4 multicast statistics:
  Input bytes :      112048      0 bps
  Output bytes :    20779920      0 bps
  Input packets:      1801      0 pps
  Output packets:    519498      0 pps
IPv6 multicast statistics:
  Input bytes :      156500      0 bps
  Output bytes :    16681118      0 bps
  Input packets:      1818      0 pps
  Output packets:    362633      0 pps
Protocol inet, MTU: 1500, Generation: 151, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 40.40.40.0/30, Local: 40.40.40.2, Broadcast: 40.40.40.3,
Generation: 167
Protocol inet6, MTU: 1500, Generation: 152, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: ::40.40.40.0/126, Local: ::40.40.40.2
Generation: 169
  Addresses, Flags: Is-Preferred

```

```

    Destination: fe80::/64, Local: fe80::21d:b5ff:fe61:d974
    Protocol multiservice, MTU: Unlimited, Generation: 171
    Generation: 153, Route table: 0
    Policer: Input: __default_arp_policer__

```

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 user@host> **show interfaces statistics detail ae0 | no-more**

statistics detail Physical interface: ae0, Enabled, Physical link is Up

(Aggregated Ethernet Ingress) Interface index: 128, SNMP ifIndex: 504, Generation: 278

Link-level type: Ethernet, MTU: 1514, Speed: 1Gbps, BPDU Error: None, MAC-REWRITE Error: None, 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: 00:1d:b5:61:db:f0, Hardware address: 00:1d:b5:61:db:f0

Last flapped : 2009-11-09 03:30:23 PST (00:01:28 ago)

Statistics last cleared: 2009-11-09 03:26:18 PST (00:05:33 ago)

Traffic statistics:

Input bytes :	544009602	54761856 bps
Output bytes :	3396	0 bps
Input packets:	11826292	148809 pps
Output packets:	42	0 pps

IPv6 transit statistics:

Input bytes :	350818604
Output bytes :	0
Input packets:	7626488
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: 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

Egress queues: 8 supported, 4 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 best-effort	21	21	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	451	451	0

```

Logical interface ae0.0 (Index 70) (SNMP ifIndex 574) (Generation 177)
Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
Statistics
  Packets      pps      Bytes      bps
Bundle:
  Input :      11826292    148809    544009602    54761856
  Output:         42         0         3396         0
Link:
  ge-5/2/0.0
  Input :      11826292    148809    544009602    54761856
  Output:         42         0         3396         0
Marker Statistics:  Marker Rx      Resp Tx      Unknown Rx      Illegal Rx
ge-5/2/0.0          0          0          0          0
Protocol inet, MTU: 1500, Generation: 236, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 30.30.30.0/30, Local: 30.30.30.2, Broadcast: 30.30.30.3,
Generation: 310
Protocol inet6, MTU: 1500, Generation: 237, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: ::30.30.30.0/126, Local: ::30.30.30.2
Generation: 312
Addresses, Flags: Is-Preferred
Destination: fe80::/64, Local: fe80::21d:b5ff:fe61:dbf0
Protocol multiservice, MTU: Unlimited, Generation: 314
Generation: 238, Route table: 0
Policer: Input: __default_arp_policer__

```

show interfaces
statistics detail
 (Aggregated Ethernet Egress)

```

user@host> show interfaces statistics detail ae0 | no-more
Physical interface: ae0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 501, Generation: 319
Link-level type: Ethernet, MTU: 1514, Speed: 1Gbps, BPDU Error: None, MAC-REWRITE
Error: None, 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: 00:1f:12:c2:37:f0, Hardware address: 00:1f:12:c2:37:f0
Last flapped : 2009-11-09 03:30:24 PST (00:02:42 ago)
Statistics last cleared: 2009-11-09 03:26:42 PST (00:06:24 ago)
Traffic statistics:
Input bytes :          440          0 bps
Output bytes :      1047338120      54635848 bps
Input packets:           7          0 pps
Output packets:    22768200      148466 pps
IPv6 transit statistics:
Input bytes :          288
Output bytes :      723202616
Input packets:           4
Output packets:    15721796
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: 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

Egress queues: 8 supported, 4 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 best-effort	201985796	201985796	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	65	65	0

Logical interface ae0.0 (Index 72) (SNMP ifIndex 505) (Generation 204)

Flags: SNMP-Traps 0x4000 Encapsulation: ENET2

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

Bundle:

Input :	7	0	440	0
---------	---	---	-----	---

Output:	22768200	148466	1047338120	54635848
---------	----------	--------	------------	----------

Link:

ge-2/1/6.0

Input :	7	0	440	0
---------	---	---	-----	---

Output:	22768200	148466	1047338120	54635848
---------	----------	--------	------------	----------

Marker Statistics:	Marker Rx	Resp Tx	Unknown Rx	Illegal Rx
--------------------	-----------	---------	------------	------------

ge-2/1/6.0	0	0	0	0
------------	---	---	---	---

Protocol inet, MTU: 1500, Generation: 291, Route table: 0

Addresses, Flags: Is-Preferred Is-Primary

Destination: 30.30.30.0/30, Local: 30.30.30.1, Broadcast: 30.30.30.3,

Generation: 420

Protocol inet6, MTU: 1500, Generation: 292, Route table: 0

Addresses, Flags: Is-Preferred Is-Primary

Destination: ::/26, Local: ::30.30.30.1

Generation: 422

Addresses, Flags: Is-Preferred

Destination: fe80::/64, Local: fe80::21f:12ff:fec2:37f0

Protocol multiservice, MTU: Unlimited, Generation: 424

Generation: 293, Route table: 0

Policer: Input: __default_arp_policer__

show interfaces statistics (SONET/SDH)

user@host> show interfaces statistics detail so-3/0/0 | no-more

Physical interface: so-3/0/0, Enabled, Physical link is Up

Interface index: 133, SNMP ifIndex: 538, Generation: 283

Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC192,
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 : 13 (last seen 00:00:04 ago)

Output: 14 (last sent 00:00:02 ago)

LCP state: Opened

NCP state: inet: Opened, inet6: Opened, iso: Not-configured, mpls: Not-configured

CHAP state: Closed

PAP state: Closed

CoS queues : 8 supported, 8 maximum usable queues

```

Last flapped   : 2009-11-09 02:52:34 PST (01:12:39 ago)
Statistics last cleared: 2009-11-09 03:58:54 PST (00:06:19 ago)
Traffic statistics:
  Input bytes   :          2559160294          54761720 bps
  Output bytes  :           10640          48 bps
  Input packets :          55633975          148809 pps
  Output packets:           216          0 pps
IPv6 transit statistics:
  Input bytes   :          647922328
  Output bytes  :           0
  Input packets :          14085269
  Output packets:           0
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: 0, 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          4              4              0
  1 expedited-fo         0              0              0
  2 assured-forw         0              0              0
  3 network-cont        213             213             0

SONET alarms   : None
SONET defects  : None

Logical interface so-3/0/0.0 (Index 72) (SNMP ifIndex 578) (Generation 182)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  Protocol inet, MTU: 4470, Generation: 244, Route table: 0
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 30.30.30.0/30, Local: 30.30.30.2, Broadcast: 30.30.30.3,
Generation: 322
    Protocol inet6, MTU: 4470, Generation: 245, Route table: 0
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: ::30.30.30.0/126, Local: ::30.30.30.2
Generation: 324
      Addresses, Flags: Is-Preferred
        Destination: fe80::/64, Local: fe80::2a0:a5ff:fe61:9264
Generation: 326

```

**show interfaces
statistics (Aggregated
SONET/SDH—Ingress)**

```

user@host> show interfaces statistics detail as0 | no-more
Physical interface: as0, Enabled, Physical link is Up
  Interface index: 132, SNMP ifIndex: 534, Generation: 282
  Link-level type: PPP, MTU: 4474, Speed: OC192, Minimum links needed: 1, Minimum
bandwidth needed: 0
  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   : 2009-11-09 03:45:53 PST (00:09:38 ago)
  Statistics last cleared: 2009-11-09 03:48:17 PST (00:07:14 ago)
  Traffic statistics:
    Input bytes   :          2969786332          54761688 bps

```



```

Output bytes :          11601          0 bps
Input packets:         64560636        148808 pps
Output packets:          225          0 pps
IPv6 transit statistics:
  Input bytes :         2086013152
  Output bytes :           0
  Input packets:        45348114
  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
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort          3              3              0
  1 expedited-fo         0              0              0
  2 assured-forw         0              0              0
  3 network-cont        222             222             0

Logical interface as0.0 (Index 71) (SNMP ifIndex 576) (Generation 179)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :        64560550    148808    2969785300    54761688
  Output:         139         0         10344         0
Link:
  so-3/0/0.0
  Input :        64560550    148808    2969785300    54761688
  Output:         139         0         10344         0
Protocol inet, MTU: 4470, Generation: 240, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 30.30.30.0/30, Local: 30.30.30.2, Broadcast: 30.30.30.3,
Generation: 316
Protocol inet6, MTU: 4470, Generation: 241, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
  Destination: ::30.30.30.0/126, Local: ::30.30.30.2
Generation: 318
Addresses, Flags: Is-Preferred
  Destination: fe80::/64, Local: fe80::2a0:a5ff:fe61:9264
Generation: 320

```

**show interfaces
statistics (Aggregated
SONET/SDH—Egress)**

```

user@host> show interfaces statistics detail as0 | no-more
Physical interface: as0, Enabled, Physical link is Up
Interface index: 132, SNMP ifIndex: 565, Generation: 323
Link-level type: PPP, MTU: 4474, Speed: OC192, Minimum links needed: 1, Minimum
bandwidth needed: 0
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 : 2009-11-09 03:43:37 PST (00:12:48 ago)
Statistics last cleared: 2009-11-09 03:48:54 PST (00:07:31 ago)
Traffic statistics:
  Input bytes :          11198          392 bps

```

```

Output bytes :          3101452132          54783448 bps
Input packets:           234              0 pps
Output packets:        67422937          148868 pps
IPv6 transit statistics:
  Input bytes :           5780
  Output bytes :        2171015678
  Input packets:           72
  Output packets:       47195993
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, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort          67422830          67422830              0

  1 expedited-fo              0              0              0

  2 assured-forw              0              0              0

  3 network-cont            90              90              0

Logical interface as0.0 (Index 71) (SNMP ifIndex 548) (Generation 206)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :         144          0        10118        392
  Output:       67422847    148868    3101450962    54783448
Link:
  so-0/1/0.0
    Input :         144          0        10118        392
    Output:       67422847    148868    3101450962    54783448
Protocol inet, MTU: 4470, Generation: 295, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 30.30.30.0/30, Local: 30.30.30.1, Broadcast: 30.30.30.3,
Generation: 426
  Protocol inet6, MTU: 4470, Generation: 296, Route table: 0
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: ::/26, Local: ::30.30.30.1
Generation: 428
    Addresses, Flags: Is-Preferred
      Destination: fe80::/64, Local: fe80::2a0:a5ff:fe63:1d0a
Generation: 429

```

show interfaces terse

Syntax	show interfaces terse
Release Information	Command introduced before Junos OS 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 109 show interfaces terse (TX Matrix Plus Router) on page 110
Output Fields	Table 22 on page 109 lists the output fields for the show interfaces terse command. Output fields are listed in the approximate order in which they appear.

Table 22: 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

```

show interfaces terse (TX Matrix Plus Router)

```
user@host> show interfaces terse
```

Interface	Admin	Link	Proto	Local	Remote
xe-0/0/0	up	up			
xe-0/0/1	up	up			
xe-0/0/2	up	up			
xe-0/0/3	up	up			
xe-6/0/0	up	up			
xe-6/0/1	up	up			
xe-6/0/2	up	up			
xe-6/0/3	up	up			
xe-6/1/0	up	up			
xe-6/1/1	up	up			
xe-6/1/2	up	up			
xe-6/1/3	up	up			
so-0/0/0	up	up			
so-0/0/0.0	up	up	inet	1.1.1.1/30	
ge-1/3/0.0	up	up	inet	--> 0/0	
ge-7/0/0	up	up			
ge-7/0/0.0	up	up	inet	2.15.1.1/30	
ge-7/0/0.1	up	up	inet	2.15.1.5/30	
ge-7/0/0.2	up	up	inet	2.15.1.9/30	
ge-7/0/0.3	up	up	inet	2.15.1.13/30	
ge-7/0/0.4	up	up	inet	2.15.1.17/30	
ge-7/0/0.5	up	up	inet	2.15.1.21/30	
...					
em0	up	up			
em0.0	up	up	inet	192.168.178.11/25	
gre	up	up			
ipip	up	up			
ixgbe0	up	up			
ixgbe0.0	up	up	inet	10.34.0.4/8	
				162.0.0.4/2	
			inet6	fe80::200:ff:fe22:4/64	
				fec0::a:22:0:4/64	
			tnp	0x22000004	
ixgbe1	up	up			
ixgbe1.0	up	up	inet	10.34.0.4/8	
				162.0.0.4/2	
			inet6	fe80::200:1ff:fe22:4/64	
				fec0::a:22:0:4/64	
			tnp	0x22000004	

CHAPTER 3

Common Output Fields

- Common Output Fields Description on page 111

Common Output Fields Description

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

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
	(889)	(597762)
bronze	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 Field on page 112
- Device Flags Field on page 112
- Family Flags Field on page 113
- Interface Flags Field on page 114
- Link Flags Field on page 114
- Logical Interface Flags Field on page 115

Addresses, Flags Field

The **Addresses, Flags** field provides information about the addresses configured for the protocol family on the logical interface and 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**—The default address of the router used as the source address by SNMP, ping, traceroute, and other network utilities.
- **Is-Preferred**—The default local address for packets originating from the local router and sent to destinations on the subnet.
- **Is-Primary**—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 Field

The **Device flags** field provides information about the physical device and 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 Field

The **Family flags** field provides information about the protocol family on the logical interface and 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.
- **Maximum labels**—Maximum number of MPLS labels configured for the MPLS protocol family on the logical interface.
- **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.
- **send-bcast-packet-to-re**—Interface is configured to forward IPv4 broadcast packets to the Routing Engine.
- **targeted-broadcast**—Interface is configured to forward IPv4 broadcast packets to the LAN interface and the Routing Engine.

- **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 Field

The **Interface flags** field provides information about the physical interface and 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 Field

The **Link flags** field provides information about the physical link and 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 the 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 Field

The **Logical interface flags** field provides information about the logical interface and 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 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/pic*port-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**—Multilink Point-to-Point Protocol (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 (TNP). Used to communicate between the Routing Engine and the router's packet forwarding components. The Junos OS automatically configures this protocol family on the router'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 121
- VRRP Operational Mode Commands on page 313

Ethernet Interface Operational Mode Commands

Table 23 on page 121 summarizes the command-line interface (CLI) commands that 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 23: Ethernet Interface Operational Mode Commands

Task	Command
Clear dynamic VLAN interfaces.	clear auto-configuration interfaces
Clear learned MAC addresses from the hardware and MAC database. Static MAC addresses are not cleared.	clear interfaces mac-database
Clear statistics that are collected for every MAC address, including policer statistics, on a given physical or logical interface.	clear interfaces mac-database statistics
Clear statistics that are collected for interface sets.	clear interfaces interface-set statistics
Clear Operation, Administration, and Management (OAM) and connectivity fault management (CFM) linktrace database information.	clear oam ethernet connectivity-fault-management linktrace path-database
Clear all statistics maintained by CFM. (Routers that support IEEE 802.1ag OAM CFM) In addition, for interfaces that support ITU-T Y.1731 Ethernet frame delay measurement (ETH-DM), also clear any ETH-DM statistics and frame counts for CFM maintenance association end points (MEPs).	clear oam ethernet connectivity-fault-management statistics
Clear Operation, Administration, and Management (OAM) link fault management state information and restart the link discovery process on Ethernet interfaces.	clear oam ethernet link-fault-management state
Clear Operation, Administration, and Management (OAM) statistics link fault management statistics for Ethernet interfaces.	clear oam ethernet link-fault-management statistics

Table 23: Ethernet Interface Operational Mode Commands (*continued*)

Task	Command
Check the reachability of a remote IEEE 802.1ag OAM maintenance association end point (MEP) or maintenance association intermediate point (MIP).	ping ethernet
Force LACP link switchover.	request lacp link-switchover
Display status information about aggregated Fast Ethernet or Gigabit Ethernet router interfaces.	show interfaces (Aggregated Ethernet)
Display information about IP demultiplexing interfaces using an underlying Ethernet interface.	show interfaces demux0 (Demux Interfaces)
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.	show interfaces diagnostics optics (Gigabit Ethernet and 10-Gigabit Ethernet)
Display status information about Fast Ethernet interfaces.	show interfaces (Fast Ethernet)
Display status information about 10-Gigabit Ethernet router interfaces.	show interfaces (10-Gigabit Ethernet)
Display information about Gigabit Ethernet or 10-Gigabit Ethernet router interface sets.	show interfaces interface-set (Ethernet Interface Set)
Display information about Gigabit Ethernet or 10-Gigabit Ethernet router interface set queues.	show interfaces interface-set queue
Display information about integrated routing and bridging interfaces.	show interfaces irb
Display Link Aggregation Control Protocol (LACP) information for aggregated, Fast Ethernet, or Gigabit Ethernet router interfaces.	show lacp interfaces
Display MAC address information for Gigabit Ethernet router interfaces.	show interfaces mac-database (Gigabit Ethernet)
Display information on a specified interface that is part of a multichassis link aggregation configuration.	show interfaces mc-ae
Display ETH-DM statistics for CFM MEPs. (MX Series routers, Ethernet DPCs).	show oam ethernet connectivity-fault-management delay-statistics
Display IEEE 802.1ag OAM connectivity fault management forwarding state information for Ethernet interfaces.	show oam ethernet connectivity-fault-management forwarding-state


Table 23: Ethernet Interface Operational Mode Commands (*continued*)

Task	Command
<p>Display OAM connectivity fault management information for Ethernet interfaces.</p> <p>For interfaces that support ETH-DM, also display any ETH-DM frame counts when the detail or extensive option is included. In all other cases, ETH-DM frame counts are zero.</p>	show oam ethernet connectivity-fault-management interfaces
<p>Display OAM connectivity fault management linktrace path database information.</p>	show oam ethernet connectivity-fault-management linktrace path-database
<p>Display OAM connectivity fault management maintenance association end point (MEP) database information.</p> <p>For interfaces that support ETH-DM, also display any ETH-DM frame counts. In all other cases, ETH-DM frame counts are zero.</p>	show oam ethernet connectivity-fault-management mep-database
<p>Display ETH-DM statistics and frame counts for CFM MEPs. (MX Series routers, Ethernet DPCs)</p>	show oam ethernet connectivity-fault-management mep-statistics
<p>Display OAM connectivity fault management path database information for hosts configured with MEP.</p>	show oam ethernet connectivity-fault-management path-database
<p>Display OAM Ethernet Virtual Connection (EVC) information for hosts configured with Ethernet Local Management Interface (E-LMI). (MX series only)</p>	show oam ethernet evc
<p>Display OAM fault management statistics for Ethernet interfaces.</p>	show oam ethernet link-fault-management
<p>Display OAM Ethernet Local Management Interface status information for an LMI configured interface. (MX series only)</p>	show oam ethernet lmi
<p>Display OAM Ethernet Local Management Interface statistics for an LMI configured interface. (MX series only)</p>	show oam ethernet lmi statistics
<p>Display protection group Ethernet ring Automatic Protection Switching (APS).</p>	show protection-group ethernet-ring aps
<p>Display data channel information for all Ethernet ring protection groups or for a specific Ethernet ring protection group.</p>	show protection-group ethernet-ring data-channel
<p>Display protection group Ethernet ring interfaces.</p>	show protection-group ethernet-ring interface

Table 23: Ethernet Interface Operational Mode Commands (*continued*)

Task	Command
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
Display all data channel logical interfaces and the VLAN IDs controlled by a ring instance data channel.	show protection-group ethernet-ring vlan
Trace the path between two Ethernet OAM end points.	traceroute ethernet

clear auto-configuration interfaces

Syntax	<code>clear auto-configuration interfaces <i>interface-name</i></code>
Release Information	Command introduced in Junos OS Release 9.5.
Description	Clear dynamically created VLAN interfaces.
	<div>  <p>NOTE: For the clear command to be successful, no interface bindings (for example, DHCP server bindings) can exist on the dynamic interface.</p> </div>
Options	<i>interface-name</i> —Name of a physical or logical interface.
Required Privilege Level	view
List of Sample Output	<p><code>clear auto-configuration interfaces</code> (All Interfaces) on page 125</p> <p><code>clear auto-configuration interfaces</code> (Single Dynamically Created Interface) on page 125</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear auto-configuration interfaces (All Interfaces)	<pre> user@host> clear auto-configuration interfaces ge-1/0/0 10 interfaces removed from device ge-1/0/0 </pre>
clear auto-configuration interfaces (Single Dynamically Created Interface)	<pre> user@host> clear auto-configuration interfaces ge-1/0/0.1073741824 Interface ge-1/0/0.1073741824 deleted </pre>

clear interfaces mac-database

Syntax	<code>clear interfaces mac-database <i>interface-name</i></code>
Release Information	Command introduced in Junos OS 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 126
Output Fields	This command produces no output.
clear interfaces mac-database	<pre>user@host> clear interfaces mac-database ge-0/0/0.0</pre>

clear interfaces mac-database statistics

Syntax	clear interfaces mac-database statistics (<i>interface-name</i> |all)
Release Information	Command introduced in Junos OS 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 127
Output Fields	This command produces no output.
clear interfaces mac-database statistics (Gigabit Ethernet)	<pre>user@host> clear interfaces mac-database statistics ge-0/1/0</pre>

clear interfaces interface-set statistics

Syntax	clear interfaces interface-set statistics (<i>interface-set-name</i> | all)
Release Information	Command introduced in Junos OS 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 128
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 OS Release 9.0.
Description	Clear all the linktrace entries and the relevant path information from the database for a particular remote host on M320, MX Series, T320, and T640 routers.
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 connectivity-fault-management policer

Syntax	clear oam ethernet connectivity-fault-management policer maintenance-domain <i>md-name</i> maintenance-association <i>ma-name</i>
Release Information	Command introduced in Junos OS Release 10.0.
Description	On M320, M120, MX Series, T320, T640 routers clear connectivity-fault-management policer statistics.
Options	<p>The following options are supported:</p> <p>maintenance-domain <i>md-name</i>—Name of an existing CFM maintenance domain. If this option is not specified, policer statistics are cleared for all maintenance associations for all maintenance domains.</p> <p>maintenance-association <i>ma-name</i> —Name of an existing CFM maintenance association. If this option is not specified, policer statistics are cleared for all maintenance associations for given maintenance domain. This option cannot be specified without specifying maintenance-domain name.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show oam ethernet connectivity-fault-management policer on page 285
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear oam ethernet connectivity-fault-management policer	<pre>user@host> clear oam ethernet connectivity-fault-management policer Policer statistics cleared</pre>
clear oam ethernet connectivity-fault-management policer maintenance-domain md-name maintenance-association ma-name	<pre>user@host> clear oam ethernet connectivity-fault-management policer maintenance-domain md5 maintenance-association ma5-1 Policer statistics cleared</pre>

clear oam ethernet connectivity-fault-management statistics

Syntax	<pre>clear oam ethernet connectivity-fault-management statistics <interface <i>ethernet-interface-name</i>> <level <i>md-level</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 8.4.</p> <p>Support for ETH-DM statistics and frame counts added in Junos OS Release 9.5.</p>
Description	<p>For all routers that support IEEE 802.1ag OAM connectivity-fault management (CFM), clear all statistics maintained by CFM.</p> <p>In addition, for Ethernet interfaces on Dense Port Concentrators (DPCs) in MX Series routers only, also clear any ITU-T Y.1731 Ethernet frame delay measurement (ETH-DM) statistics and ETH-DM frame counts.</p> <p>By default, the command clears CFM statistics and ETH-DM statistics and frame counts for CFM maintenance association end points (MEPs) attached to any interface on the router.</p>
Options	<p><i>ethernet-interface-name</i>—(Optional) Clear CFM statistics, ETH-DM statistics, and ETH-DM frame counts only for MEPs attached to the specified Ethernet physical interface.</p> <p><i>level</i>—(Optional) Clear CFM statistics, ETH-DM statistics, and ETH-DM frame counts only for MEPs within CFM maintenance domains (MDs) of the specified level.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show oam ethernet connectivity-fault-management delay-statistics on page 255 • show oam ethernet connectivity-fault-management interfaces on page 262 • show oam ethernet connectivity-fault-management mep-database on page 269 • show oam ethernet connectivity-fault-management mep-statistics on page 276
List of Sample Output	clear oam ethernet connectivity-fault-management statistics on page 131
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear oam ethernet connectivity-fault-management statistics	<pre>user@host> clear oam ethernet connectivity-fault-management statistics Cleared statistics of all CFM sessions</pre>

clear oam ethernet link-fault-management state

Syntax	clear oam ethernet link-fault-management state < <i>interface-name</i> >
Release Information	Command introduced in Junos OS Release 8.4.
Description	On all M Series, MX Series, T320, and T640 routers, 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><i>interface-name</i>—(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 132
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 < <i>interface-name</i> >
Release Information	Command introduced in Junos OS Release 8.2.
Description	On M320, M120, MX Series, T320, and T640 routers, clear Operation, Administration, and Management (OAM) link fault management statistics or state information from Ethernet interfaces.
Options	none—Clear OAM link fault management statistics from all Ethernet interfaces. <i>interface-name</i> —(Optional) Clear OAM link fault management statistics from the specified Ethernet interface only.
Required Privilege Level	view
List of Sample Output	clear oam ethernet link-fault-management statistics on page 133
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 Cleared link-fault-management statistics for all interfaces</pre>

clear protection-group ethernet-ring statistics

Syntax	clear protection-group ethernet-ring statistics <group <i>name</i> >
Release Information	Command introduced in Junos OS Release 9.4.
Description	On MX Series routers, clear the statistics for all Ethernet ring protection groups or a specific Ethernet ring protection group.
Options	<i>group name</i> —Clear the Ethernet ring protection statistics for the specified group.
Required Privilege Level	view
List of Sample Output	clear protection-group ethernet-ring statistics on page 134 clear protection-group ethernet-ring statistics on page 134
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear protection-group ethernet-ring statistics	To clear all Ethernet ring protection group statistics for all protection groups, use the following command: user@host> clear protection-group ethernet-ring statistics Cleared protection-group statistics for all groups
clear protection-group ethernet-ring statistics	To clear Ethernet ring protection group statistics for the group <i>my_prot_group</i> , use the following command: user@host> clear protection-group ethernet-ring statistics group <i>my_prot_group</i> Cleared protection-group statistics for group <i>my_prot_group</i>

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 OS Release 9.1.
Description	On M320, MX Series, T320, and T640 routers, 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 136
Output Fields	Table 24 on page 135 lists the output fields for the ping ethernet command. Output fields are listed in the approximate order in which they appear.

Table 24: 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 24: 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 OS 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 routers, 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 **revert**—Restores egress traffic processing to the primary link.

switchover—Transfers egress traffic processing to the secondary (backup) link.

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


Required Privilege Level view

List of Sample Output request interface revert on page 137

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 OS Release 9.3.
Description	Manually switch aggregated Ethernet active or standby LACP links.
	<div><p>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 or standby link and the partner (peer) is following. This scenario occurs when you configure only the actor for link protection.</p></div>
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 138
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	<pre>show interfaces <i>aenumber</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series, T Series, and MX Series routers 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 143</p> <p>show interfaces brief (Aggregated Ethernet) on page 144</p> <p>show interfaces detail (Aggregated Ethernet) on page 144</p> <p>show interfaces extensive (Aggregated Ethernet) on page 145</p> <p>show interfaces extensive (Aggregated Ethernet with VLAN Stacking) on page 147</p>
Output Fields	Table 25 on page 139 lists the output fields for the show interfaces (Aggregated Ethernet) command. Output fields are listed in the approximate order in which they appear.

Table 25: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Interface index	Index number of the physical interface, which reflects its initialization sequence.	All levels

Table 25: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interfaces Flags" section under "Common Output Fields Description" on page 111.	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 or up to down. 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

Table 25: Aggregated Ethernet 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	<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 OS 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

Table 25: Aggregated Ethernet 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
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
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
VLAN-Tag	Tag Protocol Identifier (TPID) and VLAN 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

Table 25: Aggregated Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<i>protocol-family</i>	Protocol family configured on the logical interface. Possible values are described in the “Protocol Field” section under “Common Output Fields Description” on page 111.	brief
Protocol	Protocol family configured on the logical interface. Possible values are described in the “Protocol Field” section under “Common Output Fields Description” on page 111.	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	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 address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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
(Aggregated Ethernet)**

```

user@host> show interfaces ae0 brief
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
(Aggregated Ethernet)**

```

user@host> show interfaces ae0 detail
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, 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
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	<code>show interfaces far-end-interval <i>interface-fpc/pic/port</i></code>
Release Information	Command introduced in Junos OS Release 9.4.
Description	On channelized interfaces, display the far end interval data for the specified interface.
Required Privilege Level	view
List of Sample Output	show interfaces far-end-interval coc12-5/2/0 on page 149 show interfaces far-end-interval coc1-5/2/1:1 on page 149
Output Fields	Table 26 on page 149 lists the output fields for the show interfaces far-end-interval command. Output fields are listed in the approximate order in which they appear.

Table 26: show interfaces far-end-interval Output Fields

Field Name	Field Description
Physical interface	Interface FPC/PIC/port values.
SNMP ifIndex	SNMP interface index value.
ES-L/P	Error detection—Errored seconds.
SES-L/P	Error detection—Severely errored seconds.
UAS-L/P	Error detection—Unavailable seconds.

```

show interfaces      user@host> show interfaces far-end-interval coc12-5/2/0
far-end-interval    Physical interface: coc12-5/2/0, SNMP ifIndex: 121
coc12-5/2/0         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:
                        ...

show interfaces      user@host> run show interfaces far-end-interval coc1-5/2/1:1
far-end-interval    Physical interface: coc1-5/2/1:1, SNMP ifIndex: 342
coc1-5/2/1:1        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:
```

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 OS 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 routers, the interface type is fe-fpc/pic/port. On the J Series routers, the interface type is fe-pim/O/port.</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 165</p> <p>show interfaces brief (Fast Ethernet) on page 165</p> <p>show interfaces detail (Fast Ethernet) on page 165</p> <p>show interfaces extensive (Fast Ethernet) on page 166</p>
Output Fields	Table 27 on page 151 lists the output fields for the show interfaces Fast Ethernet command. Output fields are listed in the approximate order in which they appear.

Table 27: show interfaces Fast Ethernet 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 27: show interfaces Fast Ethernet 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link flags	Information about the link. Possible values are described in the "Links Flags" section under "Common Output Fields Description" on page 111.	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

Table 27: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Schedulers	(GigabitEthernet intelligent queuing 2 (IQ2) interfaces only) Number of CoS schedulers configured.	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	Hardware MAC 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
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 under the show interfaces (10-Gigabit Ethernet) command.</p>	detail extensive

Table 27: show interfaces Fast Ethernet 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 OS 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 ignore-l3-incompletes 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 27: show interfaces Fast Ethernet 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 27: show interfaces Fast Ethernet 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 27: show interfaces Fast Ethernet 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 under the show interfaces (10-Gigabit Ethernet) command. • 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 or a cable 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 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
OTN Received Overhead Bytes	APS/PCC0: 0x02, APS/PCC1: 0x11, APS/PCC2: 0x47, APS/PCC3: 0x58 Payload Type: 0x08	extensive
OTN Transmitted Overhead Bytes	APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00 Payload Type: 0x08	extensive

Table 27: show interfaces Fast Ethernet 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 27: show interfaces Fast Ethernet 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 27: show interfaces Fast Ethernet 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 • 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) • SES-PFE—Severely errored seconds (far-end STS path) • UAS-PFE—Unavailable seconds (far-end STS path) 	extensive

Table 27: show interfaces Fast Ethernet 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
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. 	extensive

Table 27: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> • CoS transmit queue—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: 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	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels

Table 27: show interfaces Fast Ethernet 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 the “Protocol Field” section under “Common Output Fields Description” on page 111.	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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

Table 27: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Transit statistics	Number and rate of bytes and packets transiting the switch. NOTE: For Gigabit Ethernet intelligent queuing 2 (IQ2) interfaces, the logical interface egress statistics might not accurately reflect the traffic on the wire when output shaping is applied. Traffic management output shaping might drop packets after they are tallied by the Output bytes and Output packets interface counters. However, correct values display for both of these egress statistics when per-unit scheduling is enabled for the Gigabit Ethernet IQ2 physical interface, or when a single logical interface is actively using a shared scheduler.	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
Flags	Information about protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 interlace.	detail extensive none

Table 27: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive

show interfaces (Fast Ethernet)	<pre> user@host> show interfaces fe-0/0/0 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 </pre>
show interfaces brief (Fast Ethernet)	<pre> 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 </pre>
show interfaces detail (Fast Ethernet)	<pre> 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 </pre>

```

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:
    Receive      Transmit
    Total octets  0          64
    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
CoS information:

	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 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	<pre>show interfaces ge-fpc/pic/port <brief | detail | extensive | terse> <descriptions> <media> otn-options { bytes { transmit-payload-type number; } } <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series, T Series, and MX Series routers 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><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 (Gigabit Ethernet) on page 182</p> <p>show interfaces (Gigabit Ethernet on MX Series Router) on page 183</p> <p>show interfaces brief (Gigabit Ethernet) on page 183</p> <p>show interfaces detail (Gigabit Ethernet) on page 183</p> <p>show interfaces extensive (Gigabit Ethernet IQ2) on page 185</p> <p>show interfaces (Gigabit Ethernet Unnumbered Interface) on page 188</p>
Output Fields	See Table 28 on page 168 for the output fields for the show interfaces (Gigabit Ethernet) command. For Gigabit Ethernet IQ and IQE PICs, the traffic and MAC statistics vary by interface type. For more information, see Table 29 on page 182.

Table 28: show interfaces Gigabit Ethernet Output Fields

Field Name	Field Description	Level of Output
Physical Interface		

Table 28: show interfaces Gigabit Ethernet 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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
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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels

Table 28: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Link flags	Information about the link. Possible values are described in the “Links Flags” section under “Common Output Fields Description” on page 111.	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 intelligent queuing 2 (IQ2) interfaces only) Number of CoS schedulers configured.	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	Hardware MAC 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
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 under the show interfaces (10-Gigabit Ethernet) command.</p>	detail extensive

Table 28: show interfaces Gigabit Ethernet 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 OS 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 ignore-l3-incompletes 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 28: show interfaces Gigabit Ethernet 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 28: show interfaces Gigabit Ethernet 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 28: show interfaces Gigabit Ethernet 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 under the show interfaces (10-Gigabit Ethernet) command. • 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 or a cable 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 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
OTN Received Overhead Bytes	APS/PCC0: 0x02, APS/PCC1: 0x11, APS/PCC2: 0x47, APS/PCC3: 0x58 Payload Type: 0x08	extensive
OTN Transmitted Overhead Bytes	APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00 Payload Type: 0x08	extensive

Table 28: show interfaces Gigabit Ethernet 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 28: show interfaces Gigabit Ethernet 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 28: show interfaces Gigabit Ethernet 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 • 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) • SES-PFE—Severely errored seconds (far-end STS path) • UAS-PFE—Unavailable seconds (far-end STS path) 	extensive

Table 28: show interfaces Gigabit Ethernet 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
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. 	extensive

Table 28: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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	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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels

Table 28: show interfaces Gigabit Ethernet 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 the “Protocol Field” section under “Common Output Fields Description” on page 111.	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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

Table 28: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Transit statistics	Number and rate of bytes and packets transiting the switch. NOTE: For Gigabit Ethernet intelligent queuing 2 (IQ2) interfaces, the logical interface egress statistics might not accurately reflect the traffic on the wire when output shaping is applied. Traffic management output shaping might drop packets after they are tallied by the Output bytes and Output packets interface counters. However, correct values display for both of these egress statistics when per-unit scheduling is enabled for the Gigabit Ethernet IQ2 physical interface, or when a single logical interface is actively using a shared scheduler.	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
Flags	Information about protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 interlace.	detail extensive none

Table 28: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive

Table 29: Gigabit Ethernet IQ PIC Traffic and MAC Statistics by Interface Type

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

```

show interfaces (Gigabit Ethernet) 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)
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 user@host> show interfaces ge-2/2/2
(Gigabit Ethernet on Physical interface: ge-2/2/2, Enabled, Physical link is Up
MX Series Router)   Interface index: 156, SNMP ifIndex: 188
                    Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, MAC-REWRITE Error: None,
                    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
                    Schedulers     : 0
                    Current address: 00:1f:12:b7:d7:c0, Hardware address: 00:1f:12:b7:d6:76
                    Last flapped   : 2008-09-05 16:44:30 PDT (3d 01:04 ago)
                    Input rate     : 0 bps (0 pps)
                    Output rate    : 0 bps (0 pps)
                    Active alarms  : None
                    Active defects : None

Logical interface ge-2/2/2.0 (Index 82) (SNMP ifIndex 219)
  Flags: SNMP-Traps 0x20000000 Encapsulation: Ethernet-Bridge
  Input packets : 0
  Output packets: 0
  Protocol aenet, AE bundle: ae0.0   Link Index: 4

show interfaces brief user@host> show interfaces ge-3/0/2 brief
(Gigabit Ethernet)   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 user@host> show interfaces ge-3/0/2 detail
(Gigabit Ethernet)   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,

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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

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```

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

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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 user@host> show interfaces extensive ge-7/1/3
(Gigabit Ethernet IQ2) 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 OTN Received Overhead Bytes:
APS/PCC0: 0x02, APS/PCC1: 0x11, APS/PCC2: 0x47, APS/PCC3: 0x58
Payload Type: 0x08
OTN Transmitted Overhead Bytes:
APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00
Payload Type: 0x08
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
CoS information:
  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__

```

NOTE: For Gigabit Ethernet intelligent queuing 2 (IQ2) interfaces, the logical interface egress statistics displayed in the **show interfaces** command output might not accurately reflect the traffic on the wire when output shaping is applied. Traffic management output

shaping might drop packets after they are tallied by the interface counters. For detailed information, see the description of the logical interface **Transit statistics** fields in Table 28 on page 168.

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	<pre>show interfaces xe-fpc/pic/port <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced in Junos OS Release 8.0.
Description	(M320, M120, MX Series, and T Series routers 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><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 extensive (10-Gigabit Ethernet, LAN PHY Mode, IQ2) on page 203</p> <p>show interfaces extensive (10-Gigabit Ethernet, WAN PHY Mode) on page 206</p> <p>show interfaces extensive (10-Gigabit Ethernet, FEC) on page 208</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode) on page 208</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Transmit-Only) on page 209</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Receive-Only) on page 210</p>
Output Fields	See Table 30 on page 190 for the output fields for the show interfaces (10-Gigabit Ethernet) command.

Table 30: show interfaces Gigabit Ethernet 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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
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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels

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

Field Name	Field Description	Level of Output
Link flags	Information about the link. Possible values are described in the “Links Flags” section under “Common Output Fields Description” on page 111.	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 intelligent queuing 2 (IQ2) interfaces only) Number of CoS schedulers configured.	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	Hardware MAC 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
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 30 on page 190.</p>	detail extensive

Table 30: show interfaces Gigabit Ethernet 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 OS 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 ignore-l3-incompletes 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: show interfaces Gigabit Ethernet 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: show interfaces Gigabit Ethernet 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: show interfaces Gigabit Ethernet 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 203. • 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 or a cable 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 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
OTN Received Overhead Bytes	APS/PCC0: 0x02, APS/PCC1: 0x11, APS/PCC2: 0x47, APS/PCC3: 0x58 Payload Type: 0x08	extensive
OTN Transmitted Overhead Bytes	APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00 Payload Type: 0x08	extensive

Table 30: show interfaces Gigabit Ethernet 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: show interfaces Gigabit Ethernet 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: show interfaces Gigabit Ethernet 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 • 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) • SES-PFE—Severely errored seconds (far-end STS path) • UAS-PFE—Unavailable seconds (far-end STS path) 	extensive

Table 30: show interfaces Gigabit Ethernet 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
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. 	extensive

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

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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	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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels

Table 30: show interfaces Gigabit Ethernet 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 the “Protocol Field” section under “Common Output Fields Description” on page 111.	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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

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

Field Name	Field Description	Level of Output
Transit statistics	Number and rate of bytes and packets transiting the switch. NOTE: For Gigabit Ethernet intelligent queuing 2 (IQ2) interfaces, the logical interface egress statistics might not accurately reflect the traffic on the wire when output shaping is applied. Traffic management output shaping might drop packets after they are tallied by the Output bytes and Output packets interface counters. However, correct values display for both of these egress statistics when per-unit scheduling is enabled for the Gigabit Ethernet IQ2 physical interface, or when a single logical interface is actively using a shared scheduler.	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
Flags	Information about protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 interlace.	detail extensive none

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

Field Name	Field Description	Level of Output
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive

For Gigabit Ethernet IQ PICs, traffic and MAC statistics output varies. Table 31 on page 203 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 203, 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	show interfaces ge-0/3/0 extensive	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	show interfaces ge-0/3/0.50 extensive	Traffic statistics: Input bytes: 478 bytes per packet, representing the Layer 3 packet	
Outbound physical interface	show interfaces ge-0/0/0 extensive	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	show interfaces ge-0/0/0.50 extensive	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:
  Receive          Transmit
  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
CoS information:
  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 information:
  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 OS 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 or MPCs.
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 213 show interfaces interface-set detail on page 213
Output Fields	Table 32 on page 212 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 OS 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>aggregate—(Optional) Display the aggregated queuing statistics of all member logical interfaces for interface sets that have traffic-control profiles configured.</p> <p>both-ingress-egress—(Optional) On Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs, display both ingress and egress queue statistics.</p> <p>egress—(Optional) Display egress queue statistics.</p> <p>forwarding-class <i>class-name</i>—(Optional) Display queuing statistics for the specified forwarding class.</p> <p>ingress—(Optional) On Gigabit Ethernet IQ2 PICs, display ingress queue statistics.</p> <p>remaining-traffic—(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
Related Documentation	<ul style="list-style-type: none"> Example: Configuring E-LINE and E-LAN Services for a PBB Network on MX series Routers
List of Sample Output	<p>show interfaces interface-set queue (Gigabit Ethernet) on page 215</p> <p>show interfaces interface-set queue both-ingress-egress (Enhanced DPC) on page 216</p> <p>show interfaces interface-set queue egress (Enhanced DPC) on page 218</p> <p>show interfaces interface-set queue forwarding-class (Gigabit Ethernet) on page 219</p> <p>show interfaces interface-set queue (Enhanced DPC) on page 220</p> <p>show interfaces interface-set queue remaining-traffic (Gigabit Ethernet) on page 220</p>
Output Fields	Table 33 on page 215 describes the information for the show interfaces interface-set queue command.

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

Field Name	Field Description	Level of Output
Physical Interface		
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.	All levels
Ingress queues in use	Total number of ingress queues used on the specified interface set.	All levels
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      user@host> show interfaces interface-set queue ge-2/2/0-0
interface-set queue Interface set: ge-2/2/0-0
(Gigabit Ethernet)   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 best-effort
interface-set queue Interface set: ge-2/2/0-0
forwarding-class   Interface set index: 3
(Gigabit Ethernet) 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 (Gigabit Ethernet and 10-Gigabit Ethernet)


Syntax	show interfaces diagnostics optics <i>interface-name</i>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M120, M320, MX Series, T320, T640, and T1600 routers only) Display diagnostics data, warnings, and alarms for Gigabit Ethernet and 10-Gigabit Ethernet interfaces.
Options	<i>interface-name</i> —Interface name: ge-<i>fpc/pic/port</i> or xe-<i>fpc/pic/port</i> .
Additional Information	<p>The transceivers are polled in 1-second intervals for diagnostics data, warnings, and alarms. The alarms do 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 transceiver 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 device is not working.</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p> NOTE: Some transceivers do not support all optical diagnostics features described in the output fields. If the diagnostics features are not supported, you will see N/A in the following output fields.</p> </div>
Required Privilege Level	view
List of Sample Output	<p>show interfaces diagnostics optics (DWDM and DWDM OTN) on page 235</p> <p>show interfaces diagnostics optics (Bidirectional SFP) on page 235</p> <p>show interfaces diagnostics optics (SFP) on page 236</p> <p>show interfaces diagnostics optics (SFP) on page 236</p> <p>show interfaces diagnostics optics (XENPAK) on page 238</p> <p>show interfaces diagnostics optics (XFP Optics) on page 238</p>
Output Fields	Table 34 on page 222 lists the output fields for the show interfaces diagnostics optics command for DWDM and DWDM OTN PICs. Output fields are listed in the approximate order in which they appear.

Table 34: 10-Gigabit Ethernet DWDM and DWDM OTN PICs 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.

Table 34: 10-Gigabit Ethernet DWDM and DWDM OTN PICs 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.
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	Modulator temperature alarm: On or Off . Transceivers from some vendors do not support this field.
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	Receive loss of AC power alarm: On or Off . Transceivers from some vendors do not support this field.
Rx loss of PLL lock alarm	Receive loss of phase-locked loop (PLL) lock alarm: On or Off .

Table 35 on page 224 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: 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 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 .

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

Field Name	Field Description
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 .
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 .

Table 35: Gigabit Ethernet Bidirectional SFP 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: 0.0890 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 .
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 226 lists the output fields for the **show interfaces diagnostics optics** command for SFP transceivers. Output fields are listed in the approximate order in which they appear.

Table 36: Gigabit Ethernet SFP show interfaces diagnostics Output Fields

Field Name	Field Description
Physical interface	Name of the physical interface.

Table 36: Gigabit Ethernet SFP show interfaces diagnostics Output Fields (*continued*)

Field Name	Field Description
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.
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 36: Gigabit Ethernet SFP show interfaces diagnostics 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 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.

Table 36: Gigabit Ethernet SFP show interfaces diagnostics Output Fields (*continued*)

Field Name	Field Description
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 37 on page 229 lists the output fields for the **show interfaces diagnostics optics** command for 10-Gigabit Ethernet XENPAK transceivers. Output fields are listed in the approximate order in which they appear.

Table 37: 10-Gigabit Ethernet XENPAK Transceivers 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.

Table 37: 10-Gigabit Ethernet XENPAK Transceivers show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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.
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.

Table 37: 10-Gigabit Ethernet XENPAK Transceivers show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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 38 on page 231 lists the output fields for the **show interfaces diagnostics optics** command for XFP transceivers. Output fields are listed in the approximate order in which they appear.

Table 38: 10-Gigabit Ethernet XFP Transceivers show interfaces diagnostics optics Output Fields

Field Name	Field Description
Physical interface	Name of the physical interface.

Table 38: 10-Gigabit Ethernet XFP Transceivers 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 .

Table 38: 10-Gigabit Ethernet XFP Transceivers show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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 .

Table 38: 10-Gigabit Ethernet XFP Transceivers show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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 -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      user@host> show interfaces diagnostics optics ge-5/0/0
diagnostics optics  Physical interface: ge-5/0/0
(DWDM and DWDM      Laser bias current           : 79.938 mA
OTN)               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 ge-3/0/6
diagnostics optics  Physical interface: ge-3/0/6
(Bidirectional SFP) 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

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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 user@host> show interfaces diagnostics optics ge-0/3/0
diagnostics optics Physical interface: ge-0/3/0
(SFP)
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 user@host> show interfaces diagnostics optics ge-1/0/0
diagnostics optics Physical interface: ge-1/0/0
(SFP)
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

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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)
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

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```
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	<pre>show interfaces irb <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced in Junos OS 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 244</p> <p>show interfaces irb snmp-index on page 245</p>
Output Fields	Table 39 on page 240 lists the output fields for the show interfaces irb command. Output fields are listed in the approximate order in which they appear.

Table 39: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Proto	Protocol configured on the interface.	terse
Interface index	Physical interface index number, which reflects its initialization sequence.	detail extensive none

Table 39: show interfaces irb Output Fields (*continued*)

Field Name	Field Description	Level of Output
SNMP ifIndex	SNMP index number for the physical interface.	detail extensive none
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 the "Device Flags" section under "Common Output Fields Description" on page 111.	detail extensive brief none
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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 the "Links Flags" section under "Common Output Fields Description" on page 111.	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

Table 39: show interfaces irb 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
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 OS 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

Table 39: show interfaces irb Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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	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
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.	detail extensive
Transit statistics	Statistics for traffic transiting the router.	detail extensive
Protocol	Protocol family configured on the local interface. Possible values are described in the “Protocol Field” section under “Common Output Fields Description” on page 111.	detail extensive
MTU	Maximum transmission unit size on the logical interface.	detail extensive

Table 39: show interfaces irb Output Fields (*continued*)

Field Name	Field Description	Level of Output
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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 address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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, 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 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
  Policer: Input: __default_arp_policer

```

```

show interfaces irb user@host> show interfaces snmp-index 25
snmp-index 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 lacp interfaces

Syntax	show lacp interfaces <interface-name>
Release Information	Command introduced in Junos OS Release 7.6.
Description	(M Series, T Series, and MX Series routers 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>interface-name—(Optional) Display LACP information for the specified interface:</p> <ul style="list-style-type: none"> • Aggregated Ethernet—aenumber • Fast Ethernet—fe-fpc/pic/port • Gigabit Ethernet—ge-fpc/pic/port
Required Privilege Level	view
List of Sample Output	<p>show lacp interfaces (Aggregated Ethernet) on page 249</p> <p>show lacp interfaces (Gigabit Ethernet) on page 249</p>
Output Fields	Table 40 on page 246 lists the output fields for the show lacp interfaces command. Output fields are listed in the approximate order in which they appear.

Table 40: show lacp interfaces Output Fields

Field Name	Field Description
Aggregated interface	Aggregated interface value.

Table 40: 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 synchronized. 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 not synchronized. It is currently 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 40: 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—Periodic transmissions are enabled at a fast transmission rate. No Periodic—Periodic transmissions are disabled. Periodic Timer—Transitory state entered when the periodic timer expires. Slow Periodic—Periodic transmissions are enabled at a slow transmission rate. Mux State—State of the multiplexer state machine for the aggregation port. The state is one of the following values: <ul style="list-style-type: none"> Attached—Multiplexer state 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—Multiplexer state machine is in a holding process, awaiting an outcome.
LACP Statistics	<p>LACP statistics are returned when the extensive option is used and provides the following information:</p> <ul style="list-style-type: none"> LACP Rx—LACP received counter that increments for each normal hello. LACP Tx—Number of LACP transmit packet errors logged. Unknown Rx—Number of unrecognized packet errors logged. Illegal Rx—Number of invalid packets received.

```

show lacp interfaces      user@host> show lacp interfaces ae0 extensive
(Aggregated Ethernet)   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
                           distributing
                           ge-1/0/2              CURRENT          Fast periodic      Collecting
                           distributing
                           ge-1/0/1 (active)      CURRENT          Fast periodic      Collecting
                           distributing
                           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      user@host> show lacp interfaces ge-0/3/0
(Gigabit Ethernet)      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 interfaces mac-database (Gigabit Ethernet)

Syntax	<code>show interfaces mac-database (ge-fpc/pic/port | ge-fpc/pic/port.n) <mac-address mac-address></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series, T Series, and MX Series routers only) Display media access control (MAC) address information for the specified Gigabit Ethernet interface.
Options	<p><code>ge-fpc/pic/port</code>—Display MAC addresses that have been learned on all logical interfaces on a particular physical interface.</p> <p><code>ge-fpc/pic/port.n</code>—Display MAC addresses that have been learned on a particular logical interface.</p> <p><code>mac-address mac-address</code>—(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><code>show interfaces mac-database</code> (All MAC Addresses on a Port) on page 252</p> <p><code>show interfaces mac-database</code> (All MAC Addresses on a Service) on page 252</p> <p><code>show interfaces mac-database mac-address</code> on page 252</p>
Output Fields	Table 41 on page 250 lists the output fields for the <code>show interfaces mac-database</code> 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.
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.

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

Field Name	Field Description
MTU	MTU size on the physical interface.
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 the “Device Flags” section under “Common Output Fields Description” on page 111.
Interface flags	Information about the interface. Possible values are described in the “Links Flags” section under “Common Output Fields Description” on page 111.
Link flags	Information about the link. Possible values are described in the “Device Flags” section under “Common Output Fields Description” on page 111.
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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.
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.

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

Field Name	Field Description
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 mac-database (All MAC Addresses on a Port)	<pre> user@host> show interfaces mac-database ge-5/0/1 Physical interface: ge-5/0/1, Enabled, Physical link is Down 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 </pre>
show interfaces mac-database (All MAC Addresses on a Service)	<pre> 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 </pre>
show interfaces mac-database mac-address	<pre> 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, </pre>

```
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 interfaces mc-ae

Syntax	show interfaces mc-ae <id <i>identifier</i> > <unit <i>number</i> >
Release Information	Command introduced in Junos OS Release 9.6.
Description	On MX Series routers with multi-chassis aggregated Ethernet (mc-aeX) interfaces, use this command to display information about the mc-aeX interfaces.
Options	<p><identifier>—(Optional) Name of the multichassis aggregated Ethernet interface.</p> <p><number>—(Optional) Specify the logical interface by unit number.</p>
Required Privilege Level	view
List of Sample Output	show interfaces mc-ae on page 254
Output Fields	Table 42 on page 254 lists the output fields for the show interfaces mc-ae command. Output fields are listed in the approximate order in which they appear.

Table 42: show interfaces mc-ae Output Fields

Output Field Name	Field Description
Member Links	Identifiers of the configured multichassis link aggregate interfaces configured interfaces.
Local Status	Status of the local link: active or standby .
Peer Status	Status of the peer link: active or standby .
Logical Interface	Identifier and unit of the mc-ae interface.
Core Facing Interface	Label: pseudowire interface or Ethernet interface .
ICL-PL	Label: pseudowire interface or Ethernet interface .

show interfaces mc-ae user@host> show interfaces mc-ae ae0 unit 512

```

Member Links   : ae0
Local Status   : active
Peer Status    : active
Logical Interface      : ae0.512
Core Facing Interface : Label Ethernet Interface
ICL-PL          : Label Ethernet Interface

```

show oam ethernet connectivity-fault-management delay-statistics

Syntax	<pre>show oam ethernet connectivity-fault-management delay-statistics maintenance-domain <i>md-name</i> maintenance-association <i>ma-name</i> <count <i>entry-count</i>> <local-mep <i>local-mep-id</i>> <remote-mep <i>remote-mep-id</i>></pre>
Release Information	Command introduced in Junos OS Release 9.5.
Description	On MX Series routers with Ethernet interfaces on Dense Port Concentrators (DPCs), display ETH-DM statistics.
Options	<p>maintenance-domain <i>md-name</i>—Name of an existing CFM maintenance domain.</p> <p>maintenance-association <i>ma-name</i>—Name of an existing CFM maintenance association.</p> <p><count <i>entry-count</i>>—(Optional) Number of entries to display from the statistics table. The range of values is 1 through 100. The default value is 100 entries.</p> <p><local-mep <i>local-mep-id</i>>—(Optional) Numeric identifier of the local MEP. The range of values is 1 through 8192.</p> <p><remote-mep <i>remote-mep-id</i>>—(Optional) Numeric identifier of the remote MEP. The range of values is 1 through 8192.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear oam ethernet connectivity-fault-management statistics on page 131 • show oam ethernet connectivity-fault-management interfaces on page 262 • show oam ethernet connectivity-fault-management mep-database on page 269 • show oam ethernet connectivity-fault-management mep-statistics on page 276
List of Sample Output	<pre>show oam ethernet connectivity-fault-managementdelay-statistics on page 256 show oam ethernet connectivity-fault-management delay-statistics remote-mep on page 257</pre>
Output Fields	Table 43 on page 255 lists the output fields for the show oam ethernet connectivity-fault-management delay-statistics command and the show oam ethernet connectivity-fault-management mep-statistics command. Output fields are listed in the approximate order in which they appear.

Table 43: show oam ethernet connectivity-fault-management delay-statistics and mep-statistics Output Fields

Output Field Name	Field Description
MEP identifier	Maintenance association end point (MEP) numeric identifier.

Table 43: show oam ethernet connectivity-fault-management delay-statistics and mep-statistics Output Fields (*continued*)

Output Field Name	Field Description
MAC address	Unicast MAC address configured for the MEP.
Remote MEP count	Number of remote MEPs (unless you specify the remote-mep option).
Remote MEP identifier	Numeric identifier of the remote MEP.
Remote MAC address	Unicast MAC address of the remote MEP.
Index	Index number that corresponds to the ETH-DM entry in the CFM database.
One-way delay (usec)	<p>For a one-way ETH-DM session, the frame delay time, in microseconds, measured at the receiver MEP.</p> <p>For a detailed description of one-way Ethernet frame delay measurement, see the <i>ITU-T Y.1731 Ethernet Service OAM</i> topics in the <i>Junos OS Network Interfaces Configuration Guide</i>.</p>
Two-way delay (usec)	<p>For a two-way ETH-DM session, the frame delay time, in microseconds, measured at the initiator MEP.</p> <p>For a detailed description of two-way Ethernet frame delay measurement, see the <i>ITU-T Y.1731 Ethernet Service OAM</i> topics in the <i>Junos OS Network Interfaces Configuration Guide</i>.</p>
Average one-way delay	Average one-way frame delay for the statistics displayed.
Average one-way delay variation	Average one-way “frame jitter” for the statistics displayed.
Best-case one-way delay	Lowest one-way frame delay for the statistics displayed.
Worst-case one-way delay	Highest one-way frame delay for the statistics displayed.
Average two-way delay	Average two-way frame delay for the statistics displayed.
Average two-way delay variation	Average two-way “frame jitter” for the statistics displayed.
Best-case two-way delay	Lowest two-way frame delay for the statistics displayed.
Worst-case two-way delay	Highest two-way frame delay calculated in this session.

**show oam ethernet
connectivity-fault-
management
delay-statistics**

```

user@host> show oam ethernet connectivity-fault-management delay-statistics
maintenance-domain md6 maintenance-association ma6
MEP identifier: 100, MAC address: 00:05:85:73:7b:39
Remote MEP count: 2
  Remote MEP identifier: 101
  Remote MAC address: 00:05:85:73:39:4a
  Delay measurement statistics:
    Index One-way delay Two-way delay

```

	(usec)	(usec)
1	259	519
2	273	550
3	287	571
4	299	610
5	313	650

Average one-way delay : 286 usec
 Average one-way delay variation: 62 usec
 Best case one-way delay : 259 usec
 Worst case one-way delay : 313 usec
 Average two-way delay : 580 usec
 Average two-way delay variation: 26 usec
 Best case two-way delay : 519 usec
 Worst case two-way delay : 650 usec

Remote MEP identifier: 102
 Remote MAC address: 00:04:55:63:39:5a
 Delay measurement statistics:

Index	One-way delay (usec)	Two-way delay (usec)
1	29	58
2	23	59
3	27	56
4	29	62
5	33	68

Average one-way delay : 28 usec
 Average one-way delay variation: 3 usec
 Best case one-way delay : 23 usec
 Worst case one-way delay : 33 usec
 Average two-way delay : 60 usec
 Average two-way delay variation: 3 usec
 Best case two-way delay : 56 usec
 Worst case two-way delay : 68 usec

show oam ethernet
connectivity-fault-
management
delay-statistics
remote-mep

user@host> show oam ethernet connectivity-fault-management delay-statistics
 maintenance-domain md6 maintenance-association ma6 remote-mep 101
 MEP identifier: 100, MAC address: 00:05:85:73:7b:39

Remote MEP identifier: 101
 Remote MAC address: 00:05:85:73:39:4a
 Delay measurement statistics:

Index	One-way delay (usec)	Two-way delay (usec)
1	259	519
2	273	550
3	287	571
4	299	610
5	313	650

Average one-way delay : 286 usec
 Average one-way delay variation: 62 usec
 Best case one-way delay : 259 usec
 Worst case one-way delay : 313 usec
 Average two-way delay : 580 usec
 Average two-way delay variation: 26 usec
 Best case two-way delay : 519 usec
 Worst case two-way delay : 650 usec

show oam ethernet connectivity-fault-management forwarding-state

Syntax	show oam ethernet connectivity-fault-management forwarding-state interface <i>interface-name</i> | instance <i>instance-name</i> <brief | detail | extensive>
Release Information	Command introduced in Junos OS Release 8.4.
Description	On M320, MX Series, T320, and T640 routers, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management forwarding state information for Ethernet interfaces.
Options	<p>interface <i>interface-name</i>—Display forwarding state information for the specified Ethernet interface only.</p> <p>instance <i>instance-name</i>—Display forwarding state information for the specified forwarding instance only.</p> <p>brief | detail | extensive—(Optional) Display the specified level of output.</p>
Required Privilege Level	view
List of Sample Output	<p>show oam ethernet connectivity-fault-management forwarding-state instance on page 259</p> <p>show oam ethernet connectivity-fault-management forwarding-state interface on page 259</p> <p>show oam ethernet connectivity-fault-management forwarding-state interface detail on page 260</p> <p>show oam ethernet connectivity-fault-management forwarding-state interface<i>interface-name</i> on page 261</p>
Output Fields	Table 44 on page 258 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 44: 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

Table 44: show oam ethernet connectivity-fault-management forwarding-state Output Fields (*continued*)

Field Name	Field Description	Level of Output
Direction	MEP direction configured.	none
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 connectivity-fault-management forwarding-state instance
user@host> show oam ethernet connectivity-fault-management forwarding-state instance
Instance name: __+bd1__
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 connectivity-fault-management forwarding-state interface
user@host> show oam ethernet connectivity-fault-management forwarding-state interface
Interface name: ge-3/0/0.0
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	

```

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
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:
```

interface-name	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 interfaces

Syntax	<pre>show oam ethernet connectivity-fault-management interfaces <ethernet-interface-name> <level md-level> <brief | detail | extensive></pre>
Release Information	<p>Command introduced in Junos OS Release 8.4.</p> <p>Support for ITU-T Y.1731 frame delay measurement added in Junos OS Release 9.5.</p>
Description	<p>On M320, MX Series, T320, and T640 routers, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management (CFM) database information for Ethernet interfaces.</p> <p>In addition, for Ethernet interfaces on Dense Port Concentrators (DPCs) in MX Series routers only, also display any ITU-T Y.1731 frame delay measurement (ETH-DM) frame counts when detail or extensive mode is specified.</p>
Options	<p>brief | detail | extensive—(Optional) Display the specified level of output.</p> <p><i>ethernet-interface-name</i>—(Optional) Display CFM information only for CFM entities attached to the specified Ethernet interface.</p> <p><i>level md-level</i>—(Optional) Display CFM information for CFM identities enclosed within a maintenance domain of the specified level.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear oam ethernet connectivity-fault-management statistics on page 131 • show oam ethernet connectivity-fault-management delay-statistics on page 255 • show oam ethernet connectivity-fault-management mep-database on page 269 • show oam ethernet connectivity-fault-management mep-statistics on page 276
List of Sample Output	<p>show oam ethernet connectivity-fault-management interfaces on page 265</p> <p>show oam ethernet connectivity-fault-management interfaces detail on page 266</p> <p>show oam ethernet connectivity-fault-management interfaces detail (One-Way ETH-DM) on page 266</p> <p>show oam ethernet connectivity-fault-management interfaces extensive on page 267</p> <p>show oam ethernet connectivity-fault-management interfaces level on page 267</p> <p>show oam ethernet connectivity-fault-management interfaces (trunk ports) on page 268</p>
Output Fields	<p>Table 45 on page 263 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.</p>

Table 45: 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
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

Table 45: show oam ethernet connectivity-fault-management interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
LBM 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
LTMs 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
1DMs sent	If the interface is attached to an initiator MEP for a one-way ETH-DM session: Number of one-way delay measurement (1DM) PDU frames sent to the peer MEP in this session. For all other cases, this field displays 0.	detail extensive
Valid 1DMs received	If the interface is attached to a receiver MEP for a one-way ETH-DM session: Number of valid 1DM frames received. For all other cases, this field displays 0.	detail extensive
Invalid 1DMs received	If the interface is attached to a receiver MEP for a one-way ETH-DM session: Number of invalid 1DM frames received. For all other cases, this field displays 0.	detail extensive

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

Field Name	Field Description	Level of Output
DMMs sent	If the interface is attached to an initiator MEP for a two-way ETH-DM session: Number of Delay Measurement Message (DMM) PDU frames sent to the peer MEP in this session. For all other cases, this field displays 0.	detail extensive
DMRs sent	If the interface is attached to a responder MEP for a two-way ETH-DM session: Number of Delay Measurement Reply (DMR) frames sent. For all other cases, this field displays 0.	detail extensive
Valid DMRs received	If the interface is attached to an initiator MEP for a two-way ETH-DM session: Number of valid DMRs received. For all other cases, this field displays 0.	detail extensive
Invalid DMRs received	If the interface is attached to an initiator MEP for a two-way ETH-DM session: Number of invalid DMRs received. For all other cases, this field displays 0.	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 Identifier      Neighbours
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
  1DMs sent                                  : 0
  Valid 1DMs received                       : 0
  Invalid 1DMs received                     : 0
  DMMs sent                                  : 0
  DMRs sent                                  : 0
  Valid DMRs received                       : 0
  Invalid DMRs received                     : 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 detail
(One-Way ETH-DM)**

```

user@host show oam ethernet connectivity-fault-management interfaces detail
Interface name: ge-0/2/5.0, Interface status: Active, Link status: Up
Maintenance domain name: md6, Format: string, Level: 6
Maintenance association name: ma6, Format: string
Continuity-check status: enabled, Interval: 100ms, Loss-threshold: 3 frames
MEP identifier: 101, Direction: down, MAC address: 00:90:69:0a:48:57
MEP status: running
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                                  : 1590
  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
1DMs sent : 10
Valid 1DMs received : 0
Invalid 1DMs received : 0
DMMs sent : 0
DMRs sent : 0
Valid DMRs received : 0
Invalid DMRs received : 0
Remote MEP count: 1
Identifier    MAC address    State    Interface
201          00:90:69:0a:43:94    ok      ge-0/2/5.0

```

```

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
1DMs sent : 0
Valid 1DMs received : 0
Invalid 1DMs received : 0
DMMs sent : 0
DMRs sent : 0
Valid DMRs received : 0
Invalid DMRs received : 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 Identifier    Neighbours
ge-3/0/0.0    Up      Active    7        201              0
xe-0/0/0.0    Up      Active    7        203              1

```

**show oam ethernet
connectivity-fault-
management
interfaces (trunk
ports)**

user@host> show oam ethernet connectivity-fault-management interfaces

Interface	Link	Status	Level	MEP	Identifier	Neighbours
ge-4/0/1.0, vlan 100	Up	Active	5	100	0	
ge-10/3/10.4091, vlan 4091	Down	Inactive	4	400	0	
ge-4/0/0.0	Up	Active	6	200	0	

user@host> show oam ethernet connectivity-fault-management interfaces ge-4/0/0.0

Interface	Link	Status	Level	MEP	Identifier	Neighbours
ge-4/0/0.0	Up	Active	6	200	0	

user@host> show oam ethernet connectivity-fault-management interfaces ge-4/0/1.0 vlan 100

Interface	Link	Status	Level	MEP	Identifier	Neighbours
ge-4/0/1.0, vlan 100	Up	Active	5	100	0	

user@host> show oam ethernet connectivity-fault-management interfaces ge-10/3/10.4091
vlan 4091

Interface	Link	Status	Level	MEP	Identifier	Neighbours
ge-10/3/10.4091, vlan 4091	Down	Inactive	4	400	0	

show oam ethernet connectivity-fault-management mep-database

Syntax	<pre>show oam ethernet connectivity-fault-management mep-database maintenance-domain <i>domain-name</i> maintenance-association <i>ma-name</i> <local-mep <i>local-mep-id</i>> <remote-mep <i>remote-mep-id</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 8.4.</p> <p>Support for ITU-T Y.1731 frame delay measurement added in Junos OS Release 9.5.</p>
Description	<p>On M320, M120, MX Series, T320, and T640 routers, display IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.</p> <p>In addition, on M120, M320, and MX series routers, also displays port status TLV, interface status TLV, and action profile information.</p> <p>In addition, for Ethernet interfaces on Dense Port Concentrators (DPCs) in MX Series routers only, also display any ITU-T Y.1731 frame delay measurement (ETH-DM) frame counts.</p>
Options	<p><code>maintenance-association <i>ma-name</i></code>—Display connectivity fault management information for the specified maintenance association.</p> <p><code>maintenance-domain <i>domain-name</i></code>—Display connectivity fault management information for the specified maintenance domain.</p> <p><code>local-mep <i>local-mep-id</i></code>—(Optional) Display connectivity fault management information for the specified local MEP only.</p> <p><code>remote-mep <i>remote-mep-id</i></code>—(Optional) Display connectivity fault management information for the specified remote MEP only.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear oam ethernet connectivity-fault-management statistics on page 131 • show oam ethernet connectivity-fault-management delay-statistics on page 255 • show oam ethernet connectivity-fault-management interfaces on page 262 • show oam ethernet connectivity-fault-management mep-statistics on page 276
List of Sample Output	<p>show oam ethernet connectivity-fault-management mep-database on page 273</p> <p>show oam ethernet connectivity-fault-management mep-database (One-Way ETH-DM) on page 273</p> <p>show oam ethernet connectivity-fault-management mep-database local-mep remote-mep on page 274</p> <p>show oam ethernet connectivity-fault-management mep-database remote-mep (Action Profile Event) on page 274</p>

Output Fields Table 46 on page 270 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 46: 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.
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.

Table 46: show oam ethernet connectivity-fault-management mep-database Output Fields (*continued*)

Field Name	Field Description
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.
LBM 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.
IDMs sent	If the MEP is an initiator for a one-way ETH-DM session: Number of one-way delay measurement (IDM) PDU frames sent to the peer MEP in this session. For all other cases, this field displays 0.
Valid IDMs received	If the MEP is a receiver for a one-way ETH-DM session: Number of valid IDM frames received. For all other cases, this field displays 0.
Invalid IDMs received	If the MEP is a receiver for a one-way ETH-DM session: Number of invalid IDM frames received. For all other cases, this field displays 0.
DMMs sent	If the MEP is an initiator for a two-way ETH-DM session: Number of Delay Measurement Message (DMM) PDU frames sent to the peer MEP in this session. For all other cases, this field displays 0.
DMRs sent	If the MEP is a responder for a ETH-DM session: Number of Delay Measurement Reply (DMR) frames sent. For all other cases, this field displays 0.
Valid DMRs received	If the MEP is an initiator for a two-way ETH-DM session: Number of valid DMRs received. For all other cases, this field displays 0.
Invalid DMRs received	If the MEP is an initiator for a two-way ETH-DM session: Number of invalid DMRs received. For all other cases, this field displays 0.
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.

Table 46: show oam ethernet connectivity-fault-management mep-database Output Fields (*continued*)

Field Name	Field Description
LBRs sent	Number of LBRs transmitted.
LTMs sent	Linktrace messages (LTMs) transmitted.
LTMs 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	MEP identifier of the remote MEP.
State (remote MEP)	State of the remote MEP: idle , start , ok , or failed .
MAC address	MAC address of the remote MEP.
Type	Whether the remote MEP MAC address was learned using automatic discovery or configured.
Interface	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 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) .
Remote defect indication	Whether the remote defect indication (RDI) bit is set in messages that have been received or transmitted.
Port status TLV	<ul style="list-style-type: none"> In the Maintenance domain section, displays the last transmitted port status TLV value. In the Remote MEP section, displays the last value of port status TLV received from the remote MEP. <p>In the Action profile section, displays, the last occurred event port-status-tlv blocked event. This event occurred due to the reception of blocked value in the port status TLV from remote MEP.</p>
Interface status TLV	<ul style="list-style-type: none"> In the Maintenance domain section, displays the last transmitted interface status TLV value. In the Remote MEP section, displays the last value of interface status TLV received from the remote MEP. <p>In the Action profile section, if displays, the last occurred event interface-status-tlv event (either lower-layer-down or down). This event occurred due to the reception of either lower or down value in the interface status TLV from remote MEP.</p>
Action profile	Name of the action profile occurrence associated with a remote MEP.
Last event	When an action profile occurs, displays the last event that triggered it.

Table 46: show oam ethernet connectivity-fault-management mep-database Output Fields (*continued*)

Field Name	Field Description
Last event cleared	When all the configured and occurred events (under action profile) are cleared, then the action taken gets reverted (such as down interface is made up) and the corresponding time is noted and displayed.
Action	Action taken and the corresponding time of the action occurrence.

```

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
  1DMs sent                                   : 0
  Valid 1DMs received                         : 0
  Invalid 1DMs received                       : 0
  DMMs sent                                   : 0
  DMRs sent                                   : 0
  Valid DMRs received                         : 0
  Invalid DMRs received                       : 0
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 connectivity-fault-management mep-database (One-Way ETH-DM)
user@host> show oam ethernet connectivity-fault-management mep-database
maintenance-domain md6 maintenance-domain ma6
Maintenance domain name: md6, Format: string, Level: 6
Maintenance association name: ma6, Format: string
Continuity-check status: enabled, Interval: 100ms, Loss-threshold: 3 frames
MEP identifier: 101, Direction: down, MAC address: 00:90:69:0a:48:57
Auto-discovery: enabled, Priority: 0
Interface name: ge-0/2/5.0, 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                           : 1590
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
1DMs sent                           : 10
Valid 1DMs received                 : 0
Invalid 1DMs received               : 0
DMMs sent                           : 0
DMRs sent                           : 0
Valid DMRs received                 : 0
Invalid DMRs received               : 0
Remote MEP count: 1
Identifier  MAC address      State  Interface
201        00:90:69:0a:43:94  ok    ge-0/2/5.0

```

```

show oam ethernet connectivity-fault-management mep-database
local-mep remote-mep user@host> show oam ethernet connectivity-fault-management mep-database
maintenance-domain vpls-vlan2000 maintenance-association vpls-vlan200 local-mep 200
remote-mep 100
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 mep-database
remote-mep (Action Profile Event) user@host> show oam ethernet connectivity-fault-management mep-database
maintenance-domain md5 maintenance-association ma5 remote-mep 200
Maintenance domain name: md5, Format: string, Level: 5
Maintenance association name: ma5, Format: string
Continuity-check status: enabled, Interval: 1s, Loss-threshold: 3 frames
MEP identifier: 100, Direction: down, MAC address: 00:05:85:73:e8:ad
Auto-discovery: enabled, Priority: 0
Interface status TLV: none, Port status TLV: none
Interface name: ge-1/0/8.0, Interface status: Active, Link status: Up

Remote MEP identifier: 200, State: ok
MAC address: 00:05:85:73:96:1f, Type: Configured
Interface: ge-1/0/8.0
Last flapped: Never
Remote defect indication: false
Port status TLV: none
Interface status TLV: lower-layer-down

```


Action profile: juniper
Last event: Interface-status-tlv lower-layer-down
Action: Interface-down, Time: 2009-03-27 14:25:10 PDT (00:00:02 ago)

show oam ethernet connectivity-fault-management mep-statistics

Syntax	<pre>show oam ethernet connectivity-fault-management mep-statistics maintenance-domain <i>md-name</i> maintenance-association <i>ma-name</i> <mep <i>mep-id</i>> <remote-mep <i>remote-mep-id</i>> <count <i>entry-count</i>></pre>
Release Information	Command introduced in Junos OS Release 9.5.
Description	On MX Series routers with Ethernet interfaces on Dense Port Concentrators (DPCs), display ETH-DM statistics and ETH-DM frame counts.
Options	<p><i>md-name</i>—Name of an existing CFM maintenance domain.</p> <p><i>ma-name</i>—Name of an existing CFM maintenance association.</p> <p><i>local-mep-id</i>—(Optional) Numeric identifier of the local MEP. The range of values is 1 through 8192.</p> <p><i>remote-mep-id</i>—(Optional) Numeric identifier of the remote MEP. The range of values is 1 through 8192.</p> <p><i>entry-count</i>—(Optional) Number of entries to display from the statistics table. The range of values is 1 through 100. The default value is 100 entries.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> clear oam ethernet connectivity-fault-management statistics on page 131 show oam ethernet connectivity-fault-management delay-statistics on page 255 show oam ethernet connectivity-fault-management interfaces on page 262 show oam ethernet connectivity-fault-management mep-database on page 269
List of Sample Output	<pre>show oam ethernet connectivity-fault-management mep-statistics on page 277 show oam ethernet connectivity-fault-management mep-statistics remote-mep on page 278</pre>
Output Fields	Table 47 on page 276 lists the output fields for the show oam ethernet connectivity-fault-management mep-statistics command. Output fields are listed in the approximate order in which they appear.

Table 47: show oam ethernet connectivity-fault-management delay-statistics and mep-statistics Output Fields

Output Field Name	Field Description
MEP identifier	Maintenance association end point (MEP) numeric identifier.

Table 47: show oam ethernet connectivity-fault-management delay-statistics and mep-statistics Output Fields (*continued*)

Output Field Name	Field Description
MAC address	Unicast MAC address configured for the MEP.
Remote MEP count	Number of remote MEPs (unless you specify the remote-mep option).
Remote MEP identifier	Numeric identifier of the remote MEP.
Remote MAC address	Unicast MAC address of the remote MEP.
Index	Index number that corresponds to the ETH-DM entry in the CFM database.
One-way delay (usec)	For a one-way ETH-DM session, the frame delay time, in microseconds, measured at the receiver MEP. For a detailed description of one-way Ethernet frame delay measurement, see the <i>ITU-T Y.1731 Ethernet Service OAM</i> topics in the <i>Junos OS Network Interfaces Configuration Guide</i> .
Two-way delay (usec)	For a two-way ETH-DM session, the frame delay time, in microseconds, measured at the initiator MEP. For a detailed description of two-way Ethernet frame delay measurement, see the <i>ITU-T Y.1731 Ethernet Service OAM</i> topics in the <i>Junos OS Network Interfaces Configuration Guide</i> .
Average one-way delay	Average one-way frame delay for the statistics displayed.
Average one-way delay variation	Average one-way “frame jitter” for the statistics displayed.
Best-case one-way delay	Lowest one-way frame delay for the statistics displayed.
Worst-case one-way delay	Highest one-way frame delay for the statistics displayed.
Average two-way delay	Average two-way frame delay for the statistics displayed.
Average two-way delay variation	Average two-way “frame jitter” for the statistics displayed.
Best-case two-way delay	Lowest two-way frame delay for the statistics displayed.
Worst-case two-way delay	Highest two-way frame delay calculated in this session.

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

```
user@host> show oam ethernet connectivity-fault-management mep-statistics
maintenance-domain md1 maintenance-association ma-1
MEP identifier: 100, MAC address: 00:05:85:73:7b:39
Remote MEP count: 1
  CCMs sent                               : 6550
  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
1DMs sent                             : 5
Valid 1DMs received                  : 0
Invalid 1DMs received                 : 0
DMMs sent                             : 5
DMRs sent                             : 0
Valid DMRs received                  : 5
Invalid DMRs received                 : 0

```

Remote MEP identifier: 101

Remote MAC address: 00:05:85:73:39:4a

Delay measurement statistics:

Index	One-way delay (usec)	Two-way delay (usec)
1	259	519
2	273	550
3	287	571
4	299	610
5	313	650

Average one-way delay : 286 usec

Average one-way delay variation: 62 usec

Best case one-way delay : 259 usec

Worst case one-way delay : 313 usec

Average two-way delay : 580 usec

Average two-way delay variation: 26 usec

Best case two-way delay : 519 usec

Worst case two-way delay : 650 usec

```

show oam ethernet connectivity-fault-management mep-statistics
connectivity-fault- maintenance-domain md1 maintenance-association ma1 remote-mep 101
management
mep-statistics
remote-mep

```

```

user@host> show oam ethernet connectivity-fault-management mep-statistics
maintenance-domain md1 maintenance-association ma1 remote-mep 101
MEP identifier: 100, MAC address: 00:05:85:73:7b:39
CCMs sent : 7762
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
1DMs sent : 5
Valid 1DMs received : 0
Invalid 1DMs received : 0
DMMs sent : 5
DMRs sent : 0
Valid DMRs received : 5
Invalid DMRs received : 0

```

Remote MEP identifier: 101

Remote MAC address: 00:05:85:73:39:4a

Delay measurement statistics:

Index	One-way delay (usec)	Two-way delay (usec)
1	259	519
2	273	550
3	287	571
4	299	610
5	313	650

Average one-way delay : 286 usec
Average one-way delay variation: 62 usec
Best case one-way delay : 259 usec
Worst case one-way delay : 313 usec
Average two-way delay : 580 usec
Average two-way delay variation: 26 usec
Best case two-way delay : 519 usec
Worst case two-way delay : 650 usec

show oam ethernet connectivity-fault-management mip

Syntax	show oam ethernet connectivity-fault-management mip <qualifier>
Release Information	Command introduced in Junos OS Release 9.4.
Description	On the MX Series routers, display all the maintenance association intermediate points (MIPs) created in the system. Qualifiers also available to display specific MIPs.
Options	This command has no options.
Required Privilege Level	View
Output Fields	Table 48 on page 280 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 48: 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 connectivity-fault-management mip
user@host> show oam ethernet connectivity-fault-management mip
MIP information for instance __mip_name__

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 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 OS Release 9.0.
Description	On M320, MX Series, T320, and T640 routers, 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 282</p> <p>show oam ethernet connectivity-fault-management linktrace path-database (Two traceroute Commands) on page 282</p>
Output Fields	Table 49 on page 281 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 49: 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.

Table 49: show oam ethernet connectivity-fault-management linktrace path-database Output Fields (*continued*)

Field Name	Field Description
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.
Next hop MAC address	MAC address of the 802.1ag node that is the next hop in the LTM path.
Transaction Identifier	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 OS Release 8.4.
Description	On M320, MX Series, T320, and T640 routers, display IEEE 802.lag 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 284
Output Fields	Table 50 on page 283 lists the output fields for the show oam ethernet connectivity-fault-management path-database command. Output fields are listed in the approximate order in which they appear.

Table 50: 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.

Table 50: show oam ethernet connectivity-fault-management path-database Output Fields (*continued*)

Field Name	Field Description
Local Mep	Local MEP identifier.

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

```
user@host> show oam ethernet connectivity-fault-management path-database
maintenance-domain md1 maintenance-association ma1 00:05:85:79:39:ef
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 oam ethernet connectivity-fault-management policer

Syntax	show oam ethernet connectivity-fault-management policer <maintenance-domain <i>md-name</i> > <maintenance-association <i>ma-name</i> >
Release Information	Command introduced in Junos OS Release 10.0.
Description	On M120, M320, MX Series, T320, and T640 routers displays connectivity-fault-management policer statistics.
Options	<p>This command has the following options:</p> <p>maintenance-domain <i>md-name</i>—Name of an existing CFM maintenance domain. If this option is not specified, policer statistics are displayed for all maintenance associations for all maintenance domains.</p> <p>maintenance-association <i>ma-name</i>—Name of an existing CFM maintenance association. If this option is not specified, policer statistics are displayed for all maintenance associations for given maintenance domain. This option cannot be specified without specifying maintenance-domain name.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> clear oam ethernet connectivity-fault-management policer on page 130
List of Sample Output	<p>show oam ethernet connectivity-fault-management policer on page 286</p> <p>show oam ethernet connectivity-fault-management policer maintenance-domain <i>md-name</i> on page 286</p> <p>show oam ethernet connectivity-fault-management policer maintenance-domain <i>md-name</i> maintenance-association <i>ma-name</i> on page 287</p>
Output Fields	Table 51 on page 285 lists the output fields for the show oam ethernet connectivity-fault-management policer command. Output fields are listed in the approximate order in which they appear.

Table 51: show oam ethernet connectivity-fault-management policer Output Fields

Field Name	Field Description
Legend for Policer	<p>Describes the symbols used under the Scope and Type headings:</p> <ul style="list-style-type: none"> G - Global scope S - Service scope cc - Continuity check (Type)
Maintenance Domain	Displays the maintenance domain name.
Level	Displays the maintenance domain level configured.

Table 51: show oam ethernet connectivity-fault-management policer Output Fields (*continued*)

Field Name	Field Description
Maintenance association	Displays the maintenance association name.
Policer	Displays the policer name.
Type	Policer type. Value cc means this policer is used only to police continuity check CFM messages. Value other means this policer is used only to police non-continuity check CFM messages. Value all means this policer is used to police all CFM messages.
Scope	Policer scope. Displays whether the <i>global</i> (G) policer configuration is applicable or the session (S) specific policer config is applicable.
Drop count	Displays the number of packets dropped by the indicated policer.

show oam ethernet connectivity-fault-management policer Displays the policer information for all maintenance associations and their maintenance domains.

```
show oam ethernet connectivity-fault-management policer
Legend for Policer
G - Global scope
S - Service scope
cc - Continuity check

Maintenance Domain: md1 Level: 1
Maintenance association Policer      Type      Scope Drop count
ma1                     cfm-policer1 all      G          300
ma1-2                   cfm-policer1 cc       S          259
ma1-2                   cfm-policer1 other    G          300
Maintenance Domain: md2 Level: 2
Maintenance association Policer      Type      Scope Drop count
ma2                     cfm-policer1 cc       G          300
ma2                     cfm-policer2 other    S          223
```

show oam ethernet connectivity-fault-management policer maintenance-domain md-name Displays the policer information for the specified maintenance domain and its maintenance associations.

```
show oam ethernet connectivity-fault-management policer maintenance-domain md1
Legend for Policer
G - Global scope
S - Service scope
cc - Continuity check

Maintenance Domain: md1 Level: 1
Maintenance association Policer      Type      Scope Drop count
ma1                     cfm-policer1 all      G          300
ma1-2                   cfm-policer1 cc       S          259
ma1-2                   cfm-policer1 other    G          300
```

show oam ethernet Displays the policer information for the specified **maintenance-domain** *md-name* and

connectivity-fault **maintenance-association** *ma-name*.

-management

policer show oam ethernet connectivity-fault-management policer maintenance-domain md5

maintenance-domain maintenance-association ma5

md-name Legend for Policer

maintenance-association G - Global scope

ma-name S - Service scope

cc - Continuity check

Maintenance Domain: md5 Level: 5

Maintenance association	Policer	Type	Scope	Drop count
ma5	cfm-policer	cc	S	187
ma5	cfm-policer-2	other	S	234

show oam ethernet evc

Syntax	show oam ethernet evc <evc-id>
Release Information	Command introduced in Junos OS Release 9.5.
Description	On MX Series routers with OAM Ethernet Virtual Connection (EVC) configurations, displays the EVC configuration and status information.
Options	This command has no options.
Required Privilege Level	View
Output Fields	Table 52 on page 288 lists the output fields for the show oam ethernet evc command. Output fields are listed in the approximate order in which they appear.

Table 52: show oam ethernet evc Output Fields

Field Name	Field Description
EVC identifier	Header for the EVC information showing the EVC name, configuration, and active/inactive status.
UNI count	Number of configured and active UNIs.
Protocol	Protocol configured between the UNIs.
Local UNIs	Heading for the list of local UNIs
UNI Identifier	Name of the UNI.
Interface	Interface type-dpc/pic/port.unit-number.
Status	Status operational or not operational.

```

show oam ethernet evc      user@host> show oam ethernet evc
                             EVC identifier: evc1, Point-to-Point, Active
                             UNI count: Configured(2), Active(2)
                             Protocol: cfm, Management domain: md, Management association: ma
                             Local UNIs:
                               UNI Identifier    Interface    Status
                               uni1              ge-1/1/1    Operational
                               uni2              ge-1/1/1    Not Operational

```

show oam ethernet link-fault-management

Syntax	show oam ethernet link-fault-management <brief | detail> <interface-name>
Release Information	Command introduced in Junos OS Release 8.2.
Description	On M320, M120, MX Series, T320, and T640 routers, 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 293 show oam ethernet link-fault-management detail on page 293
Output Fields	Table 53 on page 289 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 53: 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 53: 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 the “Link Flags” section under “Common Output Fields Description” on page 111.</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 53: 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

Table 53: show oam ethernet link-fault-management Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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	<pre> 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 </pre>
show oam ethernet link-fault-management detail	<pre> 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 </pre>

show oam ethernet lmi

Syntax `show oam ethernet lmi (interface <interface-name>)`

Release Information Command introduced in Junos OS Release 9.5.

Description On MX Series routers with Gigabit Ethernet, Fast Ethernet, or aggregated Ethernet, and OAM Ethernet Local Management Interface (LMI) configuration, display the LMI information for the configured interfaces or optionally for a specified interface.

Options `interface`—(Optional) Display LMI information for a specified interface.

`interface-name`—(Optional) Display Ethernet LMI information for the specified interface only.

Required Privilege Level View

Output Fields Table 54 on page 294 lists the output fields for the **show oam ethernet lmi** command. Output fields are listed in the approximate order in which they appear.

Table 54: show oam ethernet lmi Output Fields

Field Name	Field Description
Physical Interface	Header for the EVC information showing the Ethernet virtual circuit (EVC) name, configuration, and active/inactive status.
UNI Identifier	Name of the UNI.
EVC map type	EVC configuration.
Polling verification timer	Polling verification timer status.
E-LMI state	Operational status of the E-LMI configuration in the interfaces or specified interface.
Priority/Untagged VLAN ID	To be provided.
Default EVC	The EVC set as the default EVC.
Associated EVCs	Heading for the list of configured EVCs.
EVC Identifier	EVC name.
Reference ID	To be provided.
Status	Status active or not active.
CE VLAN IDs	Customer edge VLAN ID numbers.

```
show oam ethernet lmi interface user@host> show oam ethernet lmi interface ge-1/1/1
Physical interface: ge-1/1/1, Physical link is Up
UNI identifier: uni-ce1, EVC map type: Bundling
Polling verification timer: Enabled, E-LMI state: Operational
Priority/Untagged VLAN ID: 20, Default EVC: evc1
Associated EVCs:
  EVC      Reference      Status      CE VLAN IDs
  Identifier ID
  evc1      1      Active (New)      1-2048
  evc2      2      Not Active      2049-4096
```

show oam ethernet lmi statistics

Syntax	show oam ethernet lmi statistics <interface <i>interface-name</i> >
Release Information	Command introduced in Junos OS Release 9.5.
Description	On MX Series routers with Gigabit Ethernet, Fast Ethernet, or aggregated Ethernet PICs, displays OAM Ethernet Local Management Interface (LMI) statistics.
Options	<p><i>interface</i>—(Optional) Display LMI statistics for a specified interface.</p> <p><i>interface-name</i>—(Optional) Display Ethernet LMI information for the specified Ethernet interface only.</p>
Required Privilege Level	view
List of Sample Output	show oam ethernet lmi statistics on page 296
Output Fields	Table 55 on page 296 lists the output fields for the show oam ethernet lmi statistics command. Output fields are listed in the approximate order in which they appear.

Table 55: show oam ethernet lmi statistics Output Fields

Field Name	Field Description
Physical interface	Name of the interface for the displayed statistics.
Reliability errors	Number of E-LMI reliability errors logged.
Protocol errors	Number of E-LMI protocol errors.
Status check received	Number of E-LMI status check receive errors.
Status check sent	Number of E-LMI status check sent errors.
Full status received	Number of E-LMI full status receive errors.
Full status sent	Number of E-LMI full status sent errors.
Full status continued received	Number of E-LMI status continued received errors.
Full status continued sent	Number of E-LMI full status continued sent errors.
Asynchronous status sent	Number of E-LMI asynchronous status sent errors.

```

show oam ethernet lmi statistics user@host> show oam ethernet lmi statistics interface ge-1/1/1
Physical interface: ge-1/1/1
Reliability errors                4  Protocol errors
0
Status check received            0  Status check sent

```

0		
	Full status received	694 Full status sent
694		
	Full status continued received	0 Full status continued sent
0		
	Asynchronous status sent	0

show protection-group ethernet-ring aps

Syntax	show protection-group ethernet-ring aps
Release Information	Command introduced in Junos OS 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.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show protection-group ethernet-ring data-channel on page 300 • show protection-group ethernet-ring interface on page 302 • show protection-group ethernet-ring node-state on page 304 • show protection-group ethernet-ring statistics on page 306 • show protection-group ethernet-ring vlan on page 308
List of Sample Output	show protection-group ethernet-ring aps (Owner Node, Normal Operation) on page 299 show protection-group ethernet-ring aps (Ring Node, Normal Operation) on page 299 show protection-group ethernet-ring aps (Owner Node, Failure Condition) on page 299 show protection-group ethernet-ring aps (Ring Node, Failure Condition) on page 299
Output Fields	Table 56 on page 298 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 56: show protection-group ethernet-ring aps Output Fields

Field Name	Field Description
Ethernet Ring Name	Name configured for the Ethernet ring.
Request/State	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	Whether this node is 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 ethernet-ring aps (Owner Node, Failure Condition)
user@host> show protection-group ethernet-ring aps
Ethernet Ring Name Request/state No Flush Ring Protection Link Blocked
pg101                SF                No                No
Originator Remote Node ID
No          00:01:02:00:00:01

show protection-group ethernet-ring aps (Ring Node, Failure Condition)
user@host> show protection-group ethernet-ring aps
Ethernet Ring Name Request/state No Flush Ring Protection Link Blocked
pg102                SF                No                Yes
Originator Remote Node ID
Yes          00:00:00:00:00:00

```

show protection-group ethernet-ring data-channel

Syntax	show protection-group ethernet-ring data-channel <brief | detail> <group-name <i>group-name</i> >
Release Information	Command introduced in Junos OS Release 10.2.
Description	On MX Series routers, display data channel information for all Ethernet ring protection groups or for a specific Ethernet ring protection group.
Options	<p>brief | detail—(Optional) Display the specified level of output.</p> <p><i>group-name</i>—(Optional) Protection group for which to display statistics. If you omit this optional field, all protection group statistics for configured groups will be displayed.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show protection-group ethernet-ring aps on page 298 • show protection-group ethernet-ring interface on page 302 • show protection-group ethernet-ring node-state on page 304 • show protection-group ethernet-ring statistics on page 306 • show protection-group ethernet-ring vlan on page 308
List of Sample Output	show protection-group ethernet-ring data-channel on page 301
Output Fields	Table 57 on page 300 lists the output fields for the show protection-group ethernet-ring data-channel command. Output fields are listed in the approximate order in which they appear.

Table 57: show protection-group ethernet-ring data-channel Output Fields

Field Name	Field Description
Interface	Name of the interface configured for the Ethernet ring.
STP Index	The Spanning Tree Protocol (STP) index number used by each interface in an Ethernet ring. The STP index controls the forwarding behavior for a set of VLANs on a data channel on an Ethernet ring port. For multiple Ethernet ring instances on a physical ring port, there are multiple STP index numbers. Different ring instances will have different STP index numbers and may have different forwarding behavior.
Forward State	<p>Forwarding state on the Ethernet ring.</p> <ul style="list-style-type: none"> • fowarding—Indicates packets are being forwarded. • discarding—Indicates packets are being discarded.

```
show protection-group ethernet-ring data-channel
user@host> show protection-group ethernet-ring data-channel
Ethernet ring data channel information for protection group pg301
Interface    STP index    Forward State
ge-1/0/3     71           forwarding
ge-1/0/4     82           forwarding

Ethernet ring data channel information for protection group pg302
Interface    STP index    Forward State
ge-1/0/3     52           forwarding
ge-1/0/4     91           forwarding
```

show protection-group ethernet-ring interface

Syntax	show protection-group ethernet-ring interface
Release Information	Command introduced in Junos OS Release 9.4.
Description	On MX Series routers, displays the status of the Automatic Protection Switching (APS) interfaces on an Ethernet ring.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show protection-group ethernet-ring interface (Owner Node, Normal Operation) on page 303 show protection-group ethernet-ring interface (Ring Node, Normal Operation) on page 303 show protection-group ethernet-ring interface (Owner Node, Failure Condition) on page 303 show protection-group ethernet-ring interface (Ring Node, Failure Condition) on page 303
Output Fields	Table 58 on page 302 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 58: show protection-group ethernet-ring interface Output Fields

Field Name	Field Description
Ethernet ring port parameters for protection group <i>group-name</i>	Output is organized by configured protection group.
Interface	Physical interfaces configured for the Ethernet ring.
Control Channel	Logical unit configured on the physical interface. <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.
Forwarding State	State of the ring forwarding on the interface: discarding or forwarding .
Ring Protection Link End	Whether this interface is the end of the ring: Yes or No .
Signal Failure	Whether there a signal failure exists on the link: Clear 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 OS Release 9.4.
Description	On MX Series routers, displays the status of the Automatic Protection Switching (APS) nodes on an Ethernet ring.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show protection-group ethernet-ring node-state (Owner Node, Normal Operation) on page 305 show protection-group ethernet-ring node-state (Ring Node, Normal Operation) on page 305 show protection-group ethernet-ring node-state (Owner Node, Failure Condition) on page 305 show protection-group ethernet-ring node-state (Ring Node, Failure Condition) on page 305
Output Fields	Table 59 on page 304 lists the output fields for the show protection-group ethernet-ring node-state command. Output fields are listed in the approximate order in which they appear.

Table 59: show protection-group ethernet-ring node-state Output Fields

Field Name	Field Description
Ethernet Ring Name	Name configured for the Ethernet ring.
APS State	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	Whether this node is the ring owner: Yes or No .
Restore Timer	Restoration timer: Enabled or Disabled .
Guard Timer	Guard timer: Enabled or Disabled .

Table 59: show protection-group ethernet-ring node-state Output Fields (*continued*)

Field Name	Field Description
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
show protection-group ethernet-ring node-state (Ring Node, Normal Operation)	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
show protection-group ethernet-ring node-state (Ring Node, Failure Condition)	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
show protection-group ethernet-ring node-state (Ring Node, Failure Condition)	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 OS 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 307 show protection-group ethernet-ring statistics (Ring Node, Normal Operation) on page 307 show protection-group ethernet-ring statistics (Owner Node, Failure Condition) on page 307 show protection-group ethernet-ring statistics (Ring Node, Failure Condition) on page 307
Output Fields	Table 60 on page 306 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 60: show protection-group ethernet-ring statistics Output Fields

Field Name	Field Description
Ethernet Ring Statistics for PG	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

```

show protection-group ethernet-ring vlan

Syntax	show protection-group ethernet-ring vlan <brief | detail> <group-name <i>group-name</i> >
Release Information	Command introduced in Junos OS Release 10.2.
Description	On MX Series routers, display all data channel logical interfaces and the VLAN IDs controlled by a ring instance data channel.
Options	brief | detail—(Optional) Display the specified level of output. <i>group-name</i> —(Optional) 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
Related Documentation	<ul style="list-style-type: none"> • show protection-group ethernet-ring aps on page 298 • show protection-group ethernet-ring data-channel on page 300 • show protection-group ethernet-ring interface on page 302 • show protection-group ethernet-ring node-state on page 304 • show protection-group ethernet-ring statistics on page 306
List of Sample Output	show protection-group ethernet-ring vlan on page 309 show protection-group ethernet-ring vlan brief on page 309 show protection-group ethernet-ring vlan detail on page 309 show protection-group ethernet-ring vlan group-name vkm01 on page 309
Output Fields	Table 61 on page 308 lists the output fields for the show protection-group ethernet-ring vlan command. Output fields are listed in the approximate order in which they appear.

Table 61: show protection-group ethernet-ring vlan Output Fields

Field Name	Field Description
Interface	Name of the interface configured for the Ethernet protection ring.
Vlan	Name of the VLAN associated with the interface configured for the Ethernet protection ring.
STP Index	The Spanning Tree Protocol (STP) index number used by each interface in an Ethernet ring. The STP index controls the forwarding behavior for a set of VLANs on a data channel on an Ethernet ring port. For multiple Ethernet ring instances on an physical ring port, there are multiple STP index numbers. Different ring instances will have different STP index numbers and may have different forwarding behavior.

Table 61: show protection-group ethernet-ring vlan Output Fields (*continued*)

Field Name	Field Description
Bridge Domain	Name of the bridge domain that is associated with the VLAN configured for the Ethernet protection ring.

show protection-group ethernet-ring vlan user@host> show protection-group ethernet-ring vlan
Ethernet ring IFBD parameters for protection group vkm01

Interface	Vlan	STP Index	Bridge Domain
ge-2/0/8	100	130	default-switch/bd100
ge-2/0/4	100	126	default-switch/bd100

show protection-group ethernet-ring vlan brief user@host> show protection-group ethernet-ring vlan brief
Ethernet ring IFBD parameters for protection group vkm01

Interface	Vlan	STP Index	Bridge Domain
ge-2/0/8	100	130	default-switch/bd100
ge-2/0/4	100	126	default-switch/bd100

show protection-group ethernet-ring vlan detail user@host> show protection-group ethernet-ring vlan detail
Ethernet ring IFBD parameters for protection group vkm01

Interface name	: ge-2/0/8
Vlan	: 100
STP index	: 130
Bridge Domain	: default-switch/bd100
Interface name	: ge-2/0/4
Vlan	: 100
STP index	: 126
Bridge Domain	: default-switch/bd100

show protection-group ethernet-ring vlan group-name vkm01 user@host> show protection-group ethernet-ring vlan vkm01
Ethernet ring IFBD parameters for protection group vkm01

Interface	Vlan	STP Index	Bridge Domain
ge-2/0/8	100	130	default-switch/bd100
ge-2/0/4	100	126	default-switch/bd100

traceroute ethernet

Syntax	traceroute ethernet (<i>mac-address</i> | <i>mep-id</i>) maintenance-association <i>ma-name</i> maintenance-domain <i>md-name</i> ttl <i>value</i> <wait seconds>
Release Information	Command introduced in Junos OS Release 9.0. mep-id option introduced in Junos OS Release 9.1.
Description	<p>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.</p> <p>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.</p>
Options	<p><i>mac-address</i>—Destination unicast MAC address of the remote maintenance point.</p> <p><i>mep-id</i>—MEP identifier of the remote maintenance point. The range of values is 1 through 8191.</p> <p><i>maintenance-association ma-name</i>—Specifies an existing maintenance association from the set of configured maintenance associations.</p> <p><i>maintenance-domain md-name</i>—Specifies an existing maintenance domain from the set of configured maintenance domains.</p> <p><i>ttl value</i>—Number of hops to use in the linktrace request. The range is 1 to 255 hops. The default is 4.</p> <p><i>wait seconds</i>—(Optional) Maximum time to wait for a response to the traceroute request. The range is 1 to 255 seconds. The default is 5.</p>
Required Privilege Level	network
List of Sample Output	traceroute ethernet on page 311
Output Fields	Table 62 on page 310 lists the output fields for the traceroute ethernet command. Output fields are listed in the approximate order in which they appear.

Table 62: 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).

Table 62: traceroute ethernet Output Fields (*continued*)

Field Name	Field Description
Maintenance Domain	Maintenance domain specified in the traceroute command.
Level	Maintenance domain level configured.
Maintenance Association	Maintenance association specified in the traceroute command.
Local Mep	The local maintenance end point identifier.
Transaction Identifier	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 63 on page 313 summarizes the command-line interface (CLI) commands that 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 63: VRRP Operational Mode Commands

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

clear vrrp

Syntax	<code>clear vrrp (all | <i>interface-name</i>)</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Set Virtual Router Redundancy Protocol (VRRP) interface statistics to zero.
Options	<p><code>all</code>—Clear statistics on all interfaces.</p> <p><i>interface-name</i>—Clear statistics on the specified interface only.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show vrrp on page 315
List of Sample Output	clear vrrp all on page 314
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear vrrp all	<pre>user@host> clear vrrp all</pre>

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 OS 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 Documentation	<ul style="list-style-type: none"> clear vrrp on page 314
List of Sample Output	<p>show vrrp on page 320</p> <p>show vrrp brief on page 320</p> <p>show vrrp detail (IPv6) on page 320</p> <p>show vrrp detail (Route Track) on page 321</p> <p>show vrrp extensive on page 321</p> <p>show vrrp interface on page 322</p> <p>show vrrp summary on page 323</p> <p>show vrrp track detail on page 323</p> <p>show vrrp track summary on page 323</p>
Output Fields	Table 64 on page 315 lists the output fields for the show vrrp command. Output fields are listed in the approximate order in which they appear

Table 64: 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

Table 64: show vrrp Output Fields (*continued*)

Field Name	Field Description	Level of Output
Groups	Total number of VRRP groups configured on the interface.	extensive
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

Table 64: show vrrp Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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

Table 64: show vrrp Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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

Table 64: show vrrp Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Group VRRP PDU error statistics	Errored statistics for the VRRP group: <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 routers 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 routers 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	State transition statistics for the VRRP group: <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

Table 64: show vrrp Output Fields (*continued*)

Field Name	Field Description	Level of Output
VR state	VRRP information: <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	VRRP timer information: <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

                                vip  fec0::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 320

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 priority
ae1.211       up     400m   ae0.210  1      master    200

```


PART 3

Digital Transmission Interfaces

- Digital Transmission Interface Operational Mode Commands on page 327

Digital Transmission Interface Operational Mode Commands

Table 65 on page 327 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot digital transmission interfaces (T1, E1, T3, and E3). Commands are listed in alphabetical order.

Table 65: 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 OS 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 routers, the T1 interface type is t1-<i>fpc/pic/port</i>, whereas the E1 interface type is e1-<i>fpc/pic/port</i>. On the J Series routers, the T1 interface type is t1-<i>pim/O/port</i>, whereas the E1 interface type is e1-<i>pim/O/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, IMA Link) on page 338</p> <p>show interfaces (T1, PPP) on page 339</p> <p>show interfaces detail (T1, PPP) on page 339</p> <p>show interfaces extensive (T1 CRC Errors) on page 340</p> <p>show interfaces extensive (T1, PPP) on page 340</p> <p>show interfaces (E1, Frame Relay) on page 342</p> <p>show interfaces detail (E1, Frame Relay) on page 343</p> <p>show interfaces extensive (E1, Frame Relay) on page 344</p> <p>show interfaces (E1, IMA Link) on page 346</p>
Output Fields	Table 66 on page 328 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 66: 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

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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: 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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	All levels
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.	detail extensive
IMA Link alarms	Current active IMA link alarms, including the following: <ul style="list-style-type: none"> • LIF • LODS • RFI-IMA • Tx-Mis-Connected • Tx-Unusable-FE • Rx-Unusable-FE • Link Fault 	detail extensive none

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
IMA Link defects	Current active IMA link defects, including the following: <ul style="list-style-type: none"> • LIF • LODS • RFI-IMA • Tx-Mis-Connected • Tx-Unusable-FE • Rx-Unusable-FE • Link Fault 	detail extensive none
IMA Link state	Current active IMA link status, including the following: <ul style="list-style-type: none"> • Line: synchronized or not synchronized • Near end:—Status of near end receive and transmit links <ul style="list-style-type: none"> • Rx: Usable or Unusable • Tx: Usable or Unusable • Far end:—Status of far end receive and transmit links <ul style="list-style-type: none"> • Rx: Usable or Unusable • Tx: Usable or Unusable 	detail extensive none
IMA link media	IMA Link Media Status, provides the seconds and count state for the following link media parameters: <ul style="list-style-type: none"> • LIF • LODS • Err-ICP • IV • Rx-FC • Tx-FC • FE-Defects • FE-Rx-FC • FE-Tx-FC • Rx-ICP • Rx-Stuff • Tx-ICP • Tx-Stuff • Rx-SES • Rx-UAS • Rx-UUS • Tx-UUS • FE-Rx-SES • FE-Rx-UAS • FE-Rx-UUS • FE-Tx-UUS 	detail extensive none

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Keepalive settings	<p>(PPP and HDLC) Configured settings for keepalives.</p> <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. 	detail extensive none
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 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
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>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) 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: <i>nn</i> (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: <i>nn</i> (last sent hh:mm:ss ago). 	detail extensive none

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 Local Management Interface (LMI) packet was reported for n392dte or n393dce intervals. (See LMI settings.) 	detail extensive none
Nonmatching DCE-end DLCIs	<p>(Frame Relay. Displayed only from the DTE.) Number of DLCIs configured from the DCE.</p>	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

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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. • 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 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
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 66: 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 OS 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
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 66: T1 or E1 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 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"> • 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
T1 media or E1 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. The T1 or E1 media-specific error types are: • 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 66: 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. 	extensive
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> • CoS transmit queue—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: 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

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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>(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 , mlfr , 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

Table 66: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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
DLCI	(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: <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	(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 (T1, user@host> show interfaces t1-1/0/0
IMA Link)          IMA Link alarms : None
                   IMA Link defects : LIF, LODS
                   IMA Link state:
                     Line      : Not synchronized
                     Near end : Rx: Unusable, Tx: Usable
                     Far end  : Rx: Unusable, Tx: Usable
                   IMA link media:      Seconds      Count  State
                     LIF                0           OK
                     LODS                0           OK
                     Err-ICP             0           OK
                     IV                  0           OK
                     Rx-FC                0           OK
                     Tx-FC                0           OK
                     FE-Defects           0
                     FE-Rx-FC             0
                     FE-Tx-FC             0

```



```

Rx-ICP                                0
Rx-Stuff                              0
Tx-ICP                                11
Tx-Stuff                              0
Rx-SES                                0
Rx-UAS                                0
Rx-UUS                                1
Tx-UUS                                0
FE-Rx-SES                             0
FE-Rx-UAS                             0
FE-Rx-UUS                             0
FE-Tx-UUS                             0

```

show interfaces user@host> **show interfaces t1-1/1/0**

(T1, PPP)

```

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 user@host> **show interfaces t1-1/1/0 detail**

(T1, PPP)

```

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 information:
  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 tl1-1/1/0.0 (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 user@host> show interfaces e1-3/0/0
(E1, Frame Relay) 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 user@host> show interfaces e1-3/0/0 extensive
(E1, Frame Relay) 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 timeout : 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 information:
  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 (E1, user@host> show interfaces e1-1/0/0
IMA Link)
IMA Link alarms : None
IMA Link defects : LIF, LODS
IMA Link state:
Line : Not synchronized
Near end : Rx: Unusable, Tx: Usable
Far end : Rx: Unusable, Tx: Usable
IMA link media: Seconds Count State
LIF 0
LODS 0
Err-ICP 0
IV 0
Rx-FC 0
Tx-FC 0
FE-Defects 0
FE-Rx-FC 0
FE-Tx-FC 0
Rx-ICP 0
Rx-Stuff 0
Tx-ICP 11
Tx-Stuff 0
Rx-SES 0
Rx-UAS 0
Rx-UUS 1
Tx-UUS 0
FE-Rx-SES 0
FE-Rx-UAS 0
FE-Rx-UUS 0
FE-Tx-UUS 0

```


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 OS 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 routers, the T3 interface type is t3-fpc/pic/port, whereas the E3 interface type is e3-fpc/pic/port. On the J Series routers, the T3 interface type is t3-pim/0/port, whereas the E3 interface type is e3-pim/0/port.</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 356</p> <p>show interfaces detail (T3, PPP) on page 357</p> <p>show interfaces extensive (T3, PPP) on page 358</p> <p>show interfaces (E3, Frame Relay) on page 359</p> <p>show interfaces detail (E3, Frame Relay) on page 360</p> <p>show interfaces extensive (E3, Frame Relay) on page 361</p>
Output Fields	Table 67 on page 347 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 67: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Interface index	Physical interface's index number, which reflects its initialization sequence.	detail extensive none

Table 67: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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 67: 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
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 67: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 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). 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). 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-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: year-month-day hour:minute:second timezone (year-month-day 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

Table 67: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 OS 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 67: 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 Active defects	<p>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. 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 	detail extensive none

Table 67: 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 • PSSES—(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 67: 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. 	extensive
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> • CoS transmit queue—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: 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

Table 67: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Generation	Unique number for use by Juniper Networks technical support only.	extensive
Flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	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 , mlfr , 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none

Table 67: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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
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
 (T3, PPP)**

```
user@host> show interfaces t3-0/2/0 detail
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,
  mp1s: 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      user@host> show interfaces t3-0/2/0 extensive
extensive (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,
                        mp1s: 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
CSES                    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 information:
  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 user@host> show interfaces e3-1/2/0
(E3, Frame Relay) 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 timeout : 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 timedout  : 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 information:
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 367](#)

CHAPTER 7

IP Demux Interface Operational Mode Commands

Table 68 on page 367 summarizes the command-line interface (CLI) command that you can use to monitor and troubleshoot IP demultiplexing (demux) interfaces.

Table 68: 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 OS Release 9.0.
Description	(MX Series and M Series routers 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 373
Output Fields	Table 69 on page 368 lists the output fields for the show interfaces (demux interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 69: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111..	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

Table 69: Demux show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Interface index	Index number of the physical interface, which reflects its initialization sequence.	detail extensive none
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 the "Device Flags" section under "Common Output Fields Description" on page 111.	brief detail extensive none
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	brief detail extensive none
Link type	Data transmission type.	detail extensive none
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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

Table 69: Demux 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. • 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 whose definitions are as follows:</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 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 OS 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

Table 69: Demux 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. • MTU errors—Number of packets whose size exceeded the MTU of the interface. • Resource errors—Sum of transmit drops. 	extensive
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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	brief detail extensive none
Encapsulation	Encapsulation on the logical interface.	brief extensive none
Demux	<p>Specific IP demultiplexing (demux) values:</p> <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—inet family prefix. 	detail extensive none
protocol-family	Protocol family configured on the logical interface.	brief

Table 69: 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 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. • 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	<p>Number of transit bytes and packets received and transmitted on the local 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
Transit statistics	<p>Number and rate of bytes and packets transiting the switch.</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
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 the “Protocol Field” section under “Common Output Fields Description” on page 111.	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family on the logical interface.	detail extensive none

Table 69: Demux 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
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 the “Family Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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
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 377
- PPPoE Interface Operational Mode Commands on page 397

CHAPTER 8

PPP Interface Operational Mode Commands

Table 70 on page 377 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot Point-to-Point Protocol (PPP) interfaces. Commands are listed in alphabetical order.

Table 70: 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 *interface-name*>

Release Information Command introduced in Junos OS Release 7.6.

Description Reset PPP session statistics information.



NOTE: This command is not supported on PPPoE interfaces (pp0).

Options none—Reset PPP statistics for all interfaces.

interface *interface-name*—(Optional) Reset PPP statistics for the specified interface.

Required Privilege Level clear

Related Documentation • [show pppoe statistics on page 419](#)

List of Sample Output [clear ppp statistics on page 378](#)

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	<code>show ppp address-pool <i>pool-name</i> <detail></code>
Release Information	Command introduced in Junos OS Release 7.5.
Description	Display PPP address pool information.
Options	<p><i>pool-name</i>—Address pool name.</p> <p>detail—(Optional) Display detailed address pool information.</p>
Required Privilege Level	view
List of Sample Output	<p><code>show ppp address-pool</code> on page 380</p> <p><code>show ppp address-pool detail</code> on page 380</p>
Output Fields	Table 71 on page 379 lists the output fields for the <code>show ppp address-pool</code> command. Output fields are listed in the approximate order in which they appear.

Table 71: 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 detail user@host> show ppp address-pool ppp1 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	<code>show ppp interface <i>interface-name</i></code> <code><extensive| terse></code>
Release Information	Command introduced in Junos OS Release 7.5.
Description	Display information about PPP interfaces.
Options	<i>interface-name</i> —Name of a logical interface. <code>extensive | terse</code> —(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	<code>show ppp interface</code> on page 387 <code>show ppp interface extensive</code> on page 387 <code>show ppp interface terse</code> on page 388
Output Fields	Table 72 on page 381 lists the output fields for the show ppp interface command. Output fields are listed in the approximate order in which they appear.

Table 72: 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 , Disabled , and Tunneled .	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 72: 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 (all platforms except M120 and M320 routers): <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. • State—LCP protocol state (M120 and M320 routers): <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 available (up), but no Open has occurred. • Closing—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • Opened—Link is administratively available for traffic. A Configure-Ack has been both sent and received. • Req-sent—An attempt has been made to configure the connection. A Configure-Request has been sent but a Configure-Ack has not yet been received. • Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). • Stopped—The system is waiting for a Down event after the This-Layer-Finished action, or after sending a Terminate-Ack. • Stopping—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • Last started—LCP state start time. • Last completed—LCP state completion time. 	extensive

Table 72: show ppp interface Output Fields (*continued*)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> • 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. 	

Table 72: 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 72: 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—(All platforms except M120 and M320 routers) 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. • State—(M120 and M320 routers) 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 available (up), but no Open has occurred. • Closing—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • Opened—Link is administratively available for traffic. A Configure-Ack has been both sent and received. • Req-sent—An attempt has been made to configure the connection. A Configure-Request has been sent but a Configure-Ack has not yet been received. • Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). • Stopped—The system is waiting for a Down event after the This-Layer-Finished action, or after sending a Terminate-Ack. • Stopping—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • 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

Table 72: show ppp interface Output Fields (*continued*)

Field Name	Field Description	Level of Output
IPV6CP	<p>Internet Protocol version 6 Control Protocol (IPV6CP) information.</p> <ul style="list-style-type: none"> • State—(All platforms except M120 and M320 routers) 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. • State—(M120 and M320 routers) 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 available (up), but no Open has occurred. • Closing—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • Opened—Link is administratively available for traffic. A Configure-Ack has been both sent and received. • Req-sent—An attempt has been made to configure the connection. A Configure-Request has been sent but a Configure-Ack has not yet been received. • Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). • Stopped—The system is waiting for a Down event after the This-Layer-Finished action, or after sending a Terminate-Ack. • Stopping—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • 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
OSINLCP State	<p>OSI Network Layer Control Protocol (OSINLCP) protocol state information (all platforms except M120 and M320 routers):</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

Table 72: show ppp interface Output Fields (*continued*)

Field Name	Field Description	Level of Output
TAGCP	<p>TAGCP information.</p> <ul style="list-style-type: none"> • State—(All platforms except M120 and M320 routers) One of the following values: <ul style="list-style-type: none"> • Ack-rcvcd—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. • State—(M120 and M320 routers) One of the following values: <ul style="list-style-type: none"> • Ack-rcvcd—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 available (up), but no Open has occurred. • Closing—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • Opened—Link is administratively available for traffic. A Configure-Ack has been both sent and received. • Req-sent—An attempt has been made to configure the connection. A Configure-Request has been sent but a Configure-Ack has not yet been received. • Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). • Stopped—The system is waiting for a Down event after the This-Layer-Finished action, or after sending a Terminate-Ack. • Stopping—A Terminate-Request has been sent but a Terminate-Ack has not yet been received. • 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 OS 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 on page 393 show ppp statistics detail on page 393
Output Fields	Table 73 on page 389 lists the output fields for the show ppp statistics command. Output fields are listed in the approximate order in which they appear.

Table 73: 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

Table 73: show ppp statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bundles in pending phase	Number of unique bundles to which PPP links are referring.	none detail
Type	<p>Type of structure for which memory is allocated.</p> <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. 	detail

Table 73: 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

Table 73: show ppp statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Type	<p>If you specify the memory keyword, the following memory statistics are displayed for Ethernet interfaces on M120 and M320 routers.</p> <ul style="list-style-type: none"> • authenticate—Stores information common to all PPP authentication protocols. • linkInterface—Stores information about PPP link interfaces. • pap—Stores information about PPP PAP authentication protocol. Includes authenticator and authenticate state machines. • lcp—PPP Link Control Protocol session. Used for establishing, configuring and testing the data-link connection. Stores information for LCP session, such as negotiated options, state, and statistics. • chap—Stores information about PPP CHAP authentication protocol. Includes authenticator and authenticate state machines. • eapBuffer—Stores runtime authentication information for EAP. • eap—Stores information about PPP EAP authentication protocol. Includes authenticator and authenticate state machines. • authNone—Stores information about no PPP authentication. Includes the authenticator state machine. • networkInterface—Stores information about NCP portions of PPP protocol. • ipNcp—PPP IPCP session information. Used for configuring, negotiating, and establishing IPCP protocol. Stores the current state, and configured and negotiated options. • ipv6Ncp—PPP IPv6CP session information. Used for configuring, negotiating, and establishing IPv6CP protocol. Stores the current state, and configured and negotiated options. • osiNcp—PPP OSICP session information. Used for configuring, negotiating, and establishing OSICP protocol. Stores the current state, and configured and negotiated options. • mplsNcp—PPP MPLSCP session information. Used for configuring, negotiating, and establishing MPLSCP protocol. Stores the current state. • trace—Stores information for PPP debugging. 	memory
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

Table 73: show ppp statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Failures	Number of failed allocations.	detail

```

show ppp statistics user@host> show ppp statistics
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

Session statistics from PPP universal edge process
Total subscriber sessions: 32
Subscriber sessions in disabled phase : 32
Subscriber sessions in establish phase : 0
Subscriber sessions in authenticate phase: 0
Subscriber sessions in network phase : 0

show ppp statistics detail user@host> show ppp statistics 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 65535 0 0
Interface address 64 0 0 65535 0 0
Destination profile 65 0 0 65535 0 0
ML link settings 68 0 0 65535 0 0
IPCP blocked address 68 0 0 65535 0 0
PPP session trace 76 0 0 65535 0 0
IFL redundancy state 76 0 0 65535 0 0
Protocol family 84 0 0 65535 0 0
ML bundle settings 108 0 0 65535 0 0
PPP LCP session 120 0 0 65535 0 0
PPP NCP session 124 0 0 65535 0 0
Physical interface 124 170 0 65535 21080 170
Access profile 132 0 0 65535 0 0
ML wait entry 144 0 0 20 0 0
Group profile 164 0 0 65535 0 0
Profile client 272 0 0 65535 0 0
PPP Auth session 356 0 0 65535 0 0
Logical interface 524 0 0 65535 0 0
Non-tagged 8 2
Total 21088 172 0

Session statistics from PPP universal edge process
Total subscriber sessions: 32
Subscriber sessions in disabled phase : 32
Subscriber sessions in establish phase : 0
Subscriber sessions in authenticate phase: 0
Subscriber sessions in network phase : 0

```

Type	Size	Active	Free	Limit	Total	size	Requests	Failures
authenticate	224	1	99	16384		224	0	0
linkInterface	152	1	99	16384		152	0	0
pap	256	1	99	16384		256	0	0
lcp	272	1	99	16384		272	0	0
chap	284	0	0	16384		0	0	0
eapBuffer	1464	0	0	16384		0	0	0
eap	276	0	0	16384		0	0	0
authNone								
networkInterface	220	1	99	16384		220	0	0
ipNcp	256	1	99	16384		256	0	0
ipv6Ncp	204	0	0	16384		0	0	0
osiNcp	192	0	0	16384		0	0	0
mplsNcp	188	0	0	16384		0	0	0
trace	2052	0	16	16		0	0	0
Total						1380	0	0

show ppp summary

Syntax	show ppp summary
Release Information	Command introduced in Junos OS 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 395
Output Fields	Table 74 on page 395 lists the output fields for the show ppp summary command. Output fields are listed in the approximate order in which they appear.

Table 74: show ppp summary Output Fields

Field Name	Field Description
Interface	Interface on which the PPP session is running. An interface type of pp0 indicates an Ethernet interface type on a M120 or M320 router.
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 .

```

show ppp summary user@host> show ppp summary
Interface      Session type  Session phase  Session flags
at-4/0/0.456   PPP           Network
lsq-0/3/0.0    PPP           Disabled
lsq-1/0/0.0    PPP           Disabled
r1sq0.0        PPP           Network        NCP-only
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
pp0.12         PPP           Network

```


PPPoE Interface Operational Mode Commands

Table 75 on page 397 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot Point-to-Point Protocol over Ethernet (PPPoE) interfaces. Commands are listed in alphabetical order.

Table 75: 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 service name table information.	show pppoe service-name-tables
Display PPPoE active session information.	show pppoe sessions
Display PPPoE session statistics.	show pppoe statistics
Display PPPoE underlying interface information.	show pppoe underlying-interfaces
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 routers. 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 OS Network Interfaces Configuration Guide*.

For information about monitoring and troubleshooting Fast Ethernet interfaces, see *Ethernet Interface Operational Mode Commands*.

For information about monitoring and troubleshooting ATM-over-ADSL and ATM-over-SHDSL, interfaces, see *ATM Interface Operational Mode Commands*.

clear pppoe sessions

Syntax	clear pppoe sessions <interface <i>interface-name</i> >
Release Information	Command introduced in Junos OS Release 7.5.
Description	(J Series routers, M120 routers, and M320 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 Documentation	<ul style="list-style-type: none">• show pppoe interfaces on page 411
List of Sample Output	clear pppoe sessions on page 399
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 OS Release 7.4.
Description	(J Series routers, M120 routers, M320 routers, and MX Series 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 Documentation	<ul style="list-style-type: none">• show pppoe statistics on page 419
List of Sample Output	clear pppoe statistics on page 400
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	<pre>show interfaces pp0.logical <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series Services Routers, M120 routers, and M320 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><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 PPPoE 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 PPPoE interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces (PPPoE) on page 406</p> <p>show interfaces brief (PPPoE) on page 407</p> <p>show interfaces detail (PPPoE) on page 407</p> <p>show interfaces detail (PPPoE on J Series Services Routers) on page 408</p> <p>show interfaces extensive (PPPoE on M120 and M320 Internet Router) on page 409</p>
Output Fields	Table 76 on page 401 lists the output fields for the show interfaces (PPPoE) command. Output fields are listed in the approximate order in which they appear.

Table 76: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 76: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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 the "Link Flags" section under "Common Output Fields Description" on page 111.	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 76: 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 OS 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), then 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

Table 76: show interfaces (PPPoE) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Encapsulation	Type of encapsulation configured on the logical interface.	All levels
PPP parameters	PPP status: <ul style="list-style-type: none"> • LCP restart timer—Length of time (in milliseconds) between successive Link Control Protocol (LCP) configuration requests. • NCP restart timer—Length of time (in milliseconds) between successive Network Control Protocol (NCP) configuration requests. 	detail
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

Table 76: show interfaces (PPPoE) 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. 	detail extensive
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

Table 76: show interfaces (PPPoE) Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 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 none
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the addresses configured for the protocol family. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 user@host> show interfaces pp0
(PPPoE) 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 and M320
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 OS Release 7.4.
Description	(J Series Services Routers, M120 routers, M320 routers, and MX Series routers only) Display 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 for static interfaces can be a value from 0 through 16385. The logical unit number for dynamic interfaces can be a value from 1073741824 through the maximum number of logical interfaces supported on your router.
Required Privilege Level	view
List of Sample Output	show pppoe interfaces on page 413 show pppoe interfaces (Status for the Specified Interface) on page 413 show pppoe interfaces brief on page 413 show pppoe interfaces detail on page 414 show pppoe interfaces extensive (J Series Services Routers, M120 routers, and M320 routers only) on page 414
Output Fields	Table 77 on page 411 lists the output fields for the show pppoe interfaces command. Output fields are listed in the approximate order in which they appear. Not all fields are displayed for PPPoE interfaces on M120 and M320 routers in server mode.

Table 77: 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 .	All levels
Session ID	Session ID.	All levels
Type	Origin of the logical interface: Static or Dynamic . Indicates whether the interface was statically or dynamically created.	detail extensive none

Table 77: show pppoe interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Remote MAC address or Remote MAC	MAC address of the remote side of the connection, either the access concentrator or the PPPoE client.	All levels
Auto-reconnect timeout	(J Series Services Routers only) Time after which to try to reconnect after a PPPoE session is terminated, in seconds.	detail extensive none
Idle timeout	(J Series Services Routers only) Length of time (in seconds) that a connection can be idle before disconnecting.	detail extensive none
Session uptime	Length of time the session has been up, in <i>hh:mm:ss</i> .	detail extensive none
Dynamic Profile	Name of the dynamic profile that was used to create this interface. If the interface was statically created, this field is not displayed.	detail extensive none
Underlying interface	Interface on which PPPoE is running.	All levels
Agent Circuit ID	Agent circuit identifier that corresponds to the DSLAM interface that initiated the client service request. An asterisk is interpreted as a wildcard character and can appear at the beginning, the end, or both the beginning and end of the string. If the agent circuit ID is not configured, this field is not displayed.	detail extensive none
Agent Remote ID	Agent remote identifier that corresponds to the subscriber associated with the DSLAM interface that initiated the service request. An asterisk is interpreted as a wildcard character and can appear at the beginning, the end, or both at the beginning and end of the string. If the agent remote ID is not configured, this field is not displayed.	detail extensive none

Table 77: show pppoe interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Packet Type	<p>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. 	extensive
Timeout	<p>(J Series Services Routers only) Information about timeouts that occurred during the PPPoE session:</p> <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, Remote 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 pp0.1073741827
  (Status for the           pp0.1073741827 Index 70
  Specified Interface)      State: Session Up, Session ID: 30, Type: Dynamic,
                             Session AC name: velorum,
                             Remote MAC address: 00:90:1A:42:0A:C1,
                             Session uptime: 16:45:46 ago,
                             Underlying interface: ge-2/0/3.1 Index 73
                             Service name: premium
                             Dynamic Profile: PppoeProfile
                             Agent Circuit ID: velorum-ge-2/0/3
                             Agent Remote ID: westford

show pppoe interfaces      user@host> show pppoe interfaces brief
  brief                    Interface      Underlying      State      Session      Remote
                             interface      interface      ID         ID           MAC
                             pp0.0         ge-2/0/3.2     Session Up  27           00:90:1A:42:0A:C1
                             pp0.1         ge-2/0/3.2     Session Up  28           00:90:1A:42:0A:C1

```

pp0.1073741824	ge-2/0/3.1	Session Up	29	00:90:1A:42:0A:C1
pp0.1073741825	ge-2/0/3.1	Session Up	30	00:90:1A:42:0A:C1
pp0.1073741826	ge-2/0/3.1	Session Up	31	00:90:1A:42:0A:C1

show pppoe interfaces user@host> show pppoe interfaces detail

detail pp0.0 Index 66
 State: Down, Session ID: None, Type: Static,
 Service name: None, Configured AC name: sapphire,
 Session AC name: None, Remote 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 (J Series pp0.0 Index 66
 State: Down, Session ID: None, Type: Static,
 Service name: None, Configured AC name: sapphire,
 Session AC name: None, Remote 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 service-name-tables

Syntax	show pppoe service-name-tables <table-name>
Release Information	Command introduced in Junos OS Release 10.0.
Description	(M120 routers, M320 routers, and MX Series routers only) Display configuration information about PPPoE service name tables.
Options	none—Display the names of configured PPPoE service name tables. table-name—(Optional) Name of a configured PPPoE service name table.
Required Privilege Level	view
List of Sample Output	show pppoe service-name-tables on page 416 show pppoe service-name-tables (For the Specified Table Name) on page 416
Output Fields	Table 78 on page 415 lists the output fields for the show pppoe service-name-tables command. Output fields are listed in the approximate order in which they appear.

Table 78: show pppoe service-name-tables Output Fields

Field Name	Field Description	Level of Output
Service Name Table	Name of the PPPoE service name table.	none
Service Name	Name of a configured service in the PPPoE service name table: <ul style="list-style-type: none"> • <empty>—Service of zero length that represents an unspecified service • <any>—Default service for non-empty service entries that do not match the configured empty or named service entries • service-name—Named service entry 	none
Action	Action taken when the PPPoE underlying interface interface receives a PPPoE Active Discovery Initiation (PADI) packet with the specified named service, empty service, any service, or ACI/ARI pair: <ul style="list-style-type: none"> • Delay seconds—Number of seconds that the interface delays before responding with a PPPoE Active Discovery Offer (PADO) packet • Drop—Interface drops (ignores) the packet. • Terminate—Interface responds immediately with a PADO packet 	none
Dynamic Profile	Name of the dynamic profile with which the router creates a dynamic PPPoE subscriber interface. A dynamic profile can be assigned to a named service, empty service, any service, or ACI/ARI pair.	none
Routing Instance	Name of the routing instance in which to instantiate the dynamic PPPoE subscriber interface. A routing instance can be assigned to a named service, empty service, any service, or ACI/ARI pair.	none

Table 78: show pppoe service-name-tables Output Fields (*continued*)

Field Name	Field Description	Level of Output
Max Sessions	Maximum number of active PPPoE sessions that the router can establish with the specified named service, empty service, or any service.	none
Active Sessions	Current count of active PPPoE sessions created using the specified named service, empty service, or any service. The Active Sessions value cannot exceed the Max Sessions value.	none
ACI	Agent circuit identifier (ACI) that corresponds to the DSLAM interface that initiated the client service request. An asterisk is interpreted as a wildcard character and can appear at the beginning, the end, or both the beginning and end of the string. An ACI can be configured as part of an ACI/ARI pair for a named service, empty service, or any service.	none
ARI	Agent remote identifier (ARI) that corresponds to the subscriber associated with the DSLAM interface that initiated the service request. An asterisk is interpreted as a wildcard character and can appear at the beginning, the end, or both at the beginning and end of the string. An ARI can be configured as part of an ACI/ARI pair for a named service, empty service, or any service.	none
Static Interface	Name of the static PPPoE interface reserved for exclusive use by the PPPoE client with matching ACI/ARI information. A static interface can be configured only for an ACI/ARI pair.	none

```

show pppoe      user@host> show pppoe service-name-tables
service-name-tables
Service Name Table: test1
Service Name Table: test2
Service Name Table: test3

show pppoe      user@host> show pppoe service-name-tables Table1
service-name-tables
Service Name Table: Table1
  Service Name: <empty>
  Action: Terminate
  Dynamic Profile: BasicPppoeProfile
  Max Sessions: 100
  Active Sessions: 3
  Service Name: <any>
  Action: Drop
  ACI: velorum-ge-2/0/3
  ARI: westford
  Action: Terminate
  Static Interface: pp0.100
  ACI: volantis-ge-5/0/5
  ARI: sunnyvale
  Action: Terminate
  Static Interface: pp0.101
  Service Name: Wholesale
  Action: Terminate
  Dynamic Profile: WholesalePppoeProfile
  Routing Instance: WholesaleRI
  Max Sessions: 16000
  Active Sessions: 4

```

show pppoe sessions

Syntax	show pppoe sessions <aci <i>circuit-id-string</i> > <ari <i>remote-id-string</i> > <service <i>service-name</i> >
Release Information	Command introduced in Junos OS Release 10.2.
Description	(M120 routers, M320 routers, and MX Series routers only) Display information about all active PPPoE sessions on the router, or about the active PPPoE sessions established for a specified service name, agent circuit identifier (ACI), or agent remote identifier (ARI).
Options	<p>none—Display information for all active PPPoE sessions on the router.</p> <p>aci <i>circuit-id-string</i>—(Optional) Display information only for active PPPoE sessions established with the specified agent circuit identifier. The agent circuit identifier corresponds to the DSLAM interface that initiated the service request.</p> <p>ari <i>remote-id-string</i>—(Optional) Display information only for active PPPoE sessions established with the specified agent remote identifier. The agent remote identifier corresponds to the subscriber associated with the DSLAM interface that initiated the service request.</p> <p>service <i>service-name</i>—(Optional) Display information only for active PPPoE sessions established with the specified service, where <i>service-name</i> can be empty, any, or a named service.</p>
Required Privilege Level	view
List of Sample Output	<p>show pppoe sessions (For All Active Sessions) on page 418</p> <p>show pppoe sessions (For All Active Sessions Matching the Agent Circuit Identifier) on page 418</p>
Output Fields	Table 79 on page 417 lists the output fields for the show pppoe sessions command. Output fields are listed in the approximate order in which they appear.

Table 79: show pppoe sessions Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the statically-created or dynamically-created PPPoE interface for the active PPPoE session.	none
Underlying interface	Interface on which PPPoE is running.	none
State	State of the PPPoE session; displays Session Up for active PPPoE sessions.	none
Session ID	PPPoE session identifier.	none

Table 79: show pppoe sessions Output Fields (*continued*)

Field Name	Field Description	Level of Output
Remote MAC	MAC address of the remote side of the connection, either the access concentrator or the PPPoE client.	none

show pppoe sessions (For All Active Sessions)	user@host> show pppoe sessions				
	Interface	Underlying interface	State	Session ID	Remote MAC
	pp0.0	ge-2/0/3.2	Session Up	27	00:90:1A:42:0A:C1
	pp0.1	ge-2/0/3.2	Session Up	28	00:90:1A:42:0A:C1
	pp0.1073741824	ge-2/0/3.1	Session Up	29	00:90:1A:42:0A:C1
	pp0.1073741825	ge-2/0/3.1	Session Up	30	00:90:1A:42:0A:C1
show pppoe sessions (For All Active Sessions Matching the Agent Circuit Identifier)	user@host> show pppoe sessions aci "velorum-ge-2/0/3"				
	Interface	Underlying interface	State	Session ID	Remote MAC
	pp0.0	ge-2/0/3.2	Session Up	27	00:90:1A:42:0A:C1
	pp0.1	ge-2/0/3.2	Session Up	28	00:90:1A:42:0A:C1

show pppoe statistics

Syntax	show pppoe statistics <logical-interface-name>
Release Information	Command introduced before Junos OS Release 7.4. <i>logical-interface-name</i> option introduced in Junos OS Release 10.1.
Description	(J Series Services Routers, M120 routers, M320 routers, and MX Series routers only) Display statistics information about PPPoE interfaces.
Options	none—Display PPPoE statistics for all interfaces. <i>logical-interface-name</i> —(Optional) Name of a PPPoE underlying logical interface. Supported for M120 routers, M320 routers, and MX Series routers only.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ppp address-pool on page 379 • show pppoe underlying-interfaces on page 421
List of Sample Output	show pppoe statistics on page 420 show pppoe statistics (For the Specified Underlying Interface Only) on page 420
Output Fields	Table 80 on page 419 lists the output fields for the show pppoe statistics command. Output fields are listed in the approximate order in which they appear.

Table 80: 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.

Table 80: show pppoe statistics Output Fields (*continued*)

Field Name	Field Description
Timeouts	<p>Information about timeouts that occurred during the PPPoE session (not displayed for M120, M320, and MX Series routers):</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 statistics
 (For the Specified
 Underlying Interface
 Only)

```

user@host> show pppoe statistics ge-4/0/3.2
Active PPPoE sessions: 4
  PacketType      Sent      Received
  PADI            0          5
  PADO            5          0
  PADR            0          5
  PADS            4          0
  PADT            0          1
  Service name error 0          0
  AC system error  0          0
  Generic error     0          0
  Malformed packets 0          0
  Unknown packets   0          0

```

show pppoe underlying-interfaces

Syntax	show pppoe underlying-interfaces <brief | detail | extensive> <logical-interface-name>
Release Information	Command introduced in Junos OS Release 10.0.
Description	(M120, M320, and MX Series routers only) Display information about PPPoE underlying interfaces.
Options	brief | detail | extensive—(Optional) Display the specified level of output. logical-interface-name—(Optional) Name of a PPPoE underlying logical interface.
Required Privilege Level	view
List of Sample Output	show pppoe underlying-interfaces brief on page 422 show pppoe underlying-interfaces detail on page 422 show pppoe underlying-interfaces extensive on page 422
Output Fields	Table 81 on page 421 lists the output fields for the show pppoe underlying-interfaces command. Output fields are listed in the approximate order in which they appear.

Table 81: show pppoe underlying-interfaces Output Fields

Field Name	Field Description	Level of Output
Underlying Interface	Name of the underlying PPPoE logical interface.	All levels
Service Name Table	Name of the service name table.	All levels
Dynamic Profile	Name of the dynamic profile that was used to create this interface. If the interface was statically created, then the value is none .	All levels
Index	Index number of the logical interface, which reflects its initialization sequence.	detail extensive
State	Origin of the logical interface: Static or Dynamic . Indicates whether the interface was statically or dynamically created.	detail extensive
Max Sessions	Maximum number of PPPoE logical interfaces that can be activated on the underlying interface. When this number of logical interfaces has been established, all subsequent PPPoE Active Discovery Initiation (PADI) packets are dropped and all subsequent PPPoE Active Discovery Request (PADR) packets trigger PPPoE Active Discovery Session (PADS) error responses.	detail extensive
Active Sessions	Number of active PPPoE sessions on the underlying interface. If a dynamic profile is listed, then it is the number of active PPPoE sessions on the underlying interface that are using this profile. The Active Sessions value must not exceed the Max Sessions value.	detail extensive

Table 81: show pppoe underlying-interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Duplicate Protection	State of PPPoE duplicate protection: On or Off . When duplicate protection is configured for the underlying interface, a dynamic PPPoE logical interface cannot be activated when an existing active logical interface is present for the same PPPoE client. The uniqueness of the PPPoE client is determined by the client's MAC address.	detail extensive
AC Name	Name of the access concentrator.	detail extensive
PacketType	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

```

show pppoe user@host> show pppoe underlying-interfaces brief
underlying-interfaces Underlying Interface  Service Name Table  Dynamic Profile
brief                ge-4/0/3.1          Premium             None
                    ge-4/0/3.2          None                PppoeProfile

```

```

show pppoe user@host> show pppoe underlying-interfaces detail
underlying-interfaces ge-4/0/3.1 Index 73
detail               State: Static, Dynamic Profile: None,
                    Max Sessions: 4000, Active Sessions: 0,
                    Service Name Table: Premium, Duplicate Protection: Off
                    AC Name: velorum

                    ge-4/0/3.2 Index 78
                    State: Dynamic, Dynamic Profile: PppoeProfile,
                    Max Sessions: 500, Active Sessions: 3,
                    Service Name Table: None, Duplicate Protection: On
                    AC Name: velorum

```

```

show pppoe user@host> show pppoe underlying-interfaces extensive
underlying-interfaces ge-4/0/3.1 Index 73
extensive             State: Static, Dynamic Profile: None,
                    Max Sessions: 4000, Active Sessions: 0,
                    Service Name Table: None, Duplicate Protection: Off,
                    AC Name: velorum

```

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

ge-4/0/3.2 Index 78

State: Dynamic, Dynamic Profile: PppoeProfile,
 Max Sessions: 4000, Active Sessions: 3,
 Service Name Table: None, Duplicate Protection: On,
 AC Name: velorum

PacketType	Sent	Received
PADI	0	5
PADO	5	0
PADR	0	5
PADS	4	0
PADT	0	1
Service name error	0	0
AC system error	0	0
Generic error	0	0
Malformed packets	0	0
Unknown packets	0	0

show pppoe version

Syntax	show pppoe version
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series Services Routers, M120 routers, and M320 routers 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 424
Output Fields	Table 82 on page 424 lists the output fields for the show pppoe version command. Output fields are listed in the approximate order in which they appear.

Table 82: 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	State of the PPPoE protocol: 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 PPOE Active Discovery Offer (PADO) packet for the PPOE Active Discovery Initiation (PADI) packet sent. This timeout doubles for each successive PADI packet sent. Not displayed for M120 and M320 routers.
PADR resend timeout	Initial time, in seconds, that the router waits to receive a PPOE Active Discovery Session Confirmation (PADS) packet for the PPOE Active Discovery Request (PADR) packet sent. This timeout doubles for each successive PADR packet sent. Not displayed for M120 and M320 routers.
Max resend timeout	Maximum value, in seconds, that the PADI or PADR resend timer can accept. The maximum value is 64. Not displayed for M120 and M320 routers.
Max Configured AC timeout	Time, in seconds, during which the configured access concentrator must respond. Not displayed for M120 and M320 routers.

```

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 427](#)

CHAPTER 10

Serial Interface Operational Mode Commands

Table 83 on page 427 summarizes the command-line interface (CLI) command that you can use to monitor and troubleshoot serial interfaces.

Table 83: 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 OS 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 routers, the interface type is se-fpc/pic/port. On the J Series routers, the interface type is se-pim/0/port.</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 434</p> <p>show interfaces brief (Serial, EIA-530) on page 434</p> <p>show interfaces detail (Serial, EIA-530) on page 434</p> <p>show interfaces extensive (Serial, EIA-530) on page 435</p> <p>show interfaces (Serial, V.35) on page 436</p> <p>show interfaces brief (Serial, V.35) on page 437</p> <p>show interfaces detail (Serial, V.35) on page 437</p> <p>show interfaces extensive (Serial, V.35) on page 438</p> <p>show interfaces statistics detail (RS 449) on page 439</p>
Output Fields	Table 84 on page 428 lists the output fields for the show interfaces (Serial) command. Output fields are listed in the approximate order in which they appear.

Table 84: show interfaces (Serial) Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical interface	Name of the physical interface.	All levels

Table 84: show interfaces (Serial) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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 <i>seconds</i>—Time between successive keepalive requests. The range of values, in seconds, is 10 to 32,767. The default value is 10. Up-count <i>number</i>—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 <i>number</i>—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: <i>number (hh:mm:ss ago)</i>—Number of keepalive packets received by PPP and the time since the last keepalive packet was received. Output: <i>number (hh:mm:ss ago)</i>—Number of keepalive packets sent by PPP and the time since the last keepalive packet was sent. 	brief none

Table 84: show interfaces (Serial) 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: <i>number (last seen hh:mm:ss ago)</i>—Number of keepalive packets received by PPP and the time since the last keepalive packet was received. • Output: <i>number (last seen hh:mm:ss ago)</i>—Number of keepalive packets sent by PPP and the time since the last keepalive packet was sent. 	detail extensive
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: 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

Table 84: show interfaces (Serial) 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). • 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 OS 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 84: 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
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

Table 84: show interfaces (Serial) Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface: <ul style="list-style-type: none"> • CoS transmit queue—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: 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.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive

Table 84: show interfaces (Serial) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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
(Serial, EIA-530)**

```

user@host> show interfaces se-5/0/1
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
(Serial, EIA-530)**

```

user@host> show interfaces se-5/0/1 brief
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
(Serial, EIA-530)**

```

user@host> show interfaces se-5/0/1 detail
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, mp1s:
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, mp1s:
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 information:
  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-5/0/1.0 (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
extensive (Serial, V.35)**

```

user@host> show interfaces se-5/0/0 extensive
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 information:

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

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
statistics detail (RS
449)

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 443](#)

SONET/SDH Interface Operational Mode Commands

Table 85 on page 443 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot aggregated SONET/SDH interfaces and SONET/SDH interfaces. Commands are listed in alphabetical order.

Table 85: SONET/SDH Interface Operational Mode Commands

Task	Command
Monitor Automatic Protection Switching (APS) information.	show aps
Display status information about aggregated SONET/SDH interfaces.	show interfaces (Aggregated SONET/SDH)
Display status information about SONET/SDH interfaces.	show interfaces (SONET/SDH)
Display the transceiver temperature, laser bias current, laser output power, receive optical power, and related alarms for SONET interfaces.	show interfaces diagnostics optics (SONET)

For more information about monitoring and troubleshooting SONET interfaces, see “Investigate SONET Interfaces” in the *Junos Interfaces Network Operations Guide*.

show aps

Syntax	<code>show aps</code> <code><brief | detail | extensive | summary></code> <code><group <i>group</i> | interface <i>so-fpc/pic/port</i>></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display information about Automatic Protection Switching (APS) for SONET configurations and about Multiplex Section Protection (MSP) for SDH configurations.
Options	<p><code>none</code>—(Same as <code>brief</code>) Display brief information about APS or MSP for all groups and SONET/SDH interfaces.</p> <p><code>brief | detail | extensive | summary</code>—(Optional) Display the specified level of output.</p> <p><code>group <i>group</i></code>—(Optional) Display APS or MSP information for the specified group.</p> <p><code>interface <i>so-fpc/pic/port</i></code>—(Optional) Display APS information for the specified SONET/SDH interface.</p>
Required Privilege Level	<code>view</code>
List of Sample Output	<p>show aps on page 446</p> <p>show aps brief on page 446</p> <p>show aps detail on page 446</p> <p>show aps extensive on page 447</p>
Output Fields	Table 86 on page 445 lists the output fields for the show aps command. Output fields are listed in the approximate order in which they appear.

Table 86: 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 . On SDH configurations using Multiplex Section Protection (MSP), the APS Annex B (G.841) Lockout status is also shown in extensive output.	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

Table 86: show aps Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 446.

```

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 The following sample shows output from a SONET configuration:

```
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
```

The following sample shows output from an SDH configuration:

```
user@host> show aps extensive
Interface      Group                      Circuit  Intf state
cstm4-1/1/0    TO_MALIBU                  Working  enabled, up
Neighbor 0.0.0.0, adj up, neighbor interface disabled, dead 2.833
Channel state Working, annex-b, lockout
Protect circuit is on interface cstm4-1/2/0
Local-mode bidirectional(5), neighbor-mode bidirectional(5)
Req K1 0x00, rcv K1 0x00, xmit K1 0x00, nbr K1 0x00
      , rcv K2 0x10, xmit K2 0x10, nbr paired req 0
Wait to restore time 30, neighbor wait to restore time 30
Hello due in 0.945
cstm4-1/2/0    TO_MALIBU                  Protect  disabled, up
Neighbor 0.0.0.0, adj up, neighbor interface enabled, dead 2.955
Channel state Working, annex-b
Working circuit is on interface cstm4-1/1/0
Local-mode bidirectional(5), neighbor-mode bidirectional(5)
Req K1 0x00, rcv K1 0x00, xmit K1 0x00, nbr K1 0x00
      , rcv K2 0x10, xmit K2 0x10, nbr paired req 0
Wait to restore time 30, neighbor wait to restore time 30
Hello due in 0.735
```

show interfaces (Aggregated SONET/SDH)

Syntax	<pre>show interfaces <i>asnumber</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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><i>brief | detail | extensive | terse</i>—(Optional) Display brief interface information.</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 (Aggregated SONET) on page 452</p> <p>show interfaces brief (Aggregated SONET) on page 452</p> <p>show interfaces detail (Aggregated SONET) on page 452</p> <p>show interfaces extensive (Aggregated SONET) on page 453</p>
Output Fields	Table 87 on page 448 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 87: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Interface index	Physical interface's index number, which reflects its initialization sequence.	detail extensive none

Table 87: Aggregated SONET/SDH 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
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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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

Table 87: Aggregated SONET/SDH 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, 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
Input errors	<p>Input errors on the interface whose definitions are as follows:</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 OS 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

Table 87: Aggregated SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Flags	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	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 inet , 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 the "Family Flags" section under "Common Output Fields Description" on page 111.	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 the "Addresses Flags" section under "Common Output Fields Description" on page 111.	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

Table 87: Aggregated SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 inet.0.	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 user@host> show interfaces as0 brief
(Aggregated SONET) 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 user@host> show interfaces as0 detail
(Aggregated SONET) 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 OS Release 7.4.
Description	(M Series and T Series routers 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 468</p> <p>show interfaces brief (SDH Mode, PPP) on page 469</p> <p>show interfaces detail (SDH Mode, PPP) on page 469</p> <p>show interfaces extensive (SDH Mode, PPP) on page 470</p> <p>show interfaces brief (SONET Mode, Frame Relay) on page 472</p> <p>show interfaces (SONET Mode, Frame Relay) on page 472</p> <p>show interfaces detail (SONET Mode, Frame Relay) on page 473</p> <p>show interfaces extensive (SONET Mode, Frame Relay) on page 474</p> <p>show interfaces extensive (OC768-over-4xOC192 Mode) on page 477</p> <p>show interfaces detail (IPv6 Tracking) on page 480</p> <p>show interfaces (shared interface) on page 481</p>
Output Fields	Table 88 on page 455 lists the output fields for the show interfaces (SONET/SDH) command. Output fields are listed in the approximate order in which they appear.

Table 88: 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 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	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 the “Link Flags” section under “Common Output Fields Description” on page 111.	All levels

Table 88: SONET/SDH 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>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) 	All levels
LMI	Input: <i>value (hh:mm:ss ago)</i> , Output: <i>value (hh:mm:ss ago)</i>	brief none
LMI statistics	<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 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
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 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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. 	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 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. 	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

Table 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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: 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 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Input errors	<p>Input errors on the interface whose definitions are as follows:</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 OS 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

Table 88: SONET/SDH 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 (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
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

Table 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 • 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 88: 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 • 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
Received SONET overhead Transmitted 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. • 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-<i>N</i> 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-<i>N</i>. • Z3 and Z4—Allocated for future use. 	extensive
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

Table 88: 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
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 88: SONET/SDH 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
Received SDH overhead Transmitted SDH 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. • 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-<i>N</i> 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-<i>N</i>. • Z3 and Z4—Allocated for future use. 	extensive
Received path trace Transmitted path trace	<p>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 88: SONET/SDH 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. 	extensive
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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
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. Possible values are described in the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels
PPP parameters	The PPP loopback clear timer value.	extensive

Table 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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, psd3. • peer interface—(PSD only) Lists the logical tunnel interface that peers with the logical shared interface. For example, ut-2/1/0.2. • 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 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
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
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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none

Table 88: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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	<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 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	<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 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, Maximum labels: 3
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, Maximum labels: 3, 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 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 information:
  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, Maximum labels: 3, 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 timedout       : 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, Maximum labels: 3
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, Maximum labels: 3, 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 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 00 00 00 .....
HDLCD 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 information:
    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 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, Maximum labels: 3, 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 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    .....
...

```

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	<code>show interfaces diagnostics optics so-<i>fpc/pic/port</i></code>
Release Information	Command introduced in Junos OS Release 7.5.
Description	(M320, T320, T640, and T1600 routers only) For SONET/SDH interfaces that support optical diagnostics and monitoring, display transceiver diagnostics and data alarms.
Options	<i>so-fpc/pic/port</i> —SONET/SDH interface name.
Additional Information	<p>The transceivers are polled 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 transceiver 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>In the output fields, when an alarm is On, this indicates an error condition. Alarm Off indicates normal operation.</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p> NOTE: The <code>show interfaces diagnostics optics</code> 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> </div>
Required Privilege Level	view
List of Sample Output	<p><code>show interfaces diagnostics optics</code> (OC768 PIC) on page 490</p> <p><code>show interfaces diagnostics optics</code> (Multi-rate SONET/SDH PICs with SFP) on page 491</p> <p><code>show interfaces diagnostics optics</code> (OC192 PICs with XFP) on page 491</p>
Output Fields	Table 89 on page 483 lists the output fields for the <code>show interfaces diagnostics optics</code> command for OC768 PICs. Output fields are listed in the approximate order in which they appear.

Table 89: OC768 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 89: OC768 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.
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	Modulator temperature alarm: On or Off . Transceivers from some vendors do not support this field.
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	Receive loss of AC power alarm: On or Off . Transceivers from some vendors do not support this field.
Rx loss of PLL lock alarm	Receive loss of phase-locked loop (PLL) lock alarm: On or Off .

Table 90 on page 484 lists the output fields for the **show interfaces diagnostics optics** command for multi-rate SONET/SDH PICs with SFP transceivers. Output fields are listed in the approximate order in which they appear.

Table 90: Multi-rate SONET/SDH PICs with SFP show interfaces diagnostics optics Output Fields

Field Name	Field Description
Physical interface	Name of the physical interface.

Table 90: Multi-rate SONET/SDH PICs with SFP 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 .

Table 90: Multi-rate SONET/SDH PICs with SFP show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
Module voltage high alarm	Module voltage high alarm. Displays on or off .
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: 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 .

Table 90: Multi-rate SONET/SDH PICs with SFP show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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.
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 91 on page 487 lists the output fields for the **show interfaces diagnostics optics** command for OC192 PICs with XFP transceivers. Output fields are listed in the approximate order in which they appear.

Table 91: OC192 PIC with XFP show interfaces diagnostics optics Output Fields

Field Name	Field Description
Physical interface	Name of the physical interface.
Link	(For 4-port OC192c PIC operating in OC768-over-4xOC192 mode) The link number. Diagnostics and alarms are displayed for each link.

Table 91: OC192 PIC with XFP 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 .

Table 91: OC192 PIC with XFP show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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 .

Table 91: OC192 PIC with XFP show interfaces diagnostics optics Output Fields (*continued*)

Field Name	Field Description
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.
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
(OC768 PIC)**

```

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
(Multi-rate      Laser bias current           : 24.008 mA
SONET/SDH PICs with Laser output power        : 0.2620 mW / -5.82 dBm
SFP)             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-7/0/0
diagnostics optics Physical interface: so-7/0/0
(OC192 PICs with XFP) 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 495
- ILMI Interface Operational Mode Commands on page 545

ATM Interface Operational Mode Commands

Table 92 on page 495 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot Asynchronous Transfer Mode (ATM) interfaces on M Series and T Series routers, and ATM-over-asymmetrical digital subscriber line (ADSL) and ATM-over-symmetric high-speed digital subscriber line (SHDSL) interfaces on the J Series routers. An ATM-over-ADSL interface and an ATM-over-SHDSL interface is configured over an underlying ATM interface.

Table 92: ATM Interface Operational Mode Commands

Task	Command
Display status information about ATM interfaces.	show interfaces (ATM)
Display status information about ATM-over-ADSL interfaces.	show interfaces (ATM-over-ADSL)
Display status information about ATM-over-SHDSL interfaces.	show interfaces (ATM-over-SHDSL)

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*. For more information about monitoring and troubleshooting ATM interfaces, see “Investigate ATM Interfaces” in the *Junos Interfaces Network Operations Guide*.

show interfaces (ATM)

Syntax	<pre>show interfaces at-<i>fpc/pic/port</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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><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 the 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 (ATM, IMA Group) on page 510</p> <p>show interfaces (ATM1, SONET Mode) on page 511</p> <p>show interfaces brief (ATM1, SONET Mode) on page 511</p> <p>show interfaces detail (ATM1, SONET Mode) on page 511</p> <p>show interfaces extensive (ATM1, SONET Mode) on page 513</p> <p>show interfaces (ATM2, SDH Mode) on page 515</p> <p>show interfaces brief (ATM2, SDH Mode) on page 516</p> <p>show interfaces detail (ATM2, SDH Mode) on page 516</p> <p>show interfaces extensive (ATM2, SDH Mode) on page 518</p> <p>show interfaces (ATM2, SONET Mode) on page 520</p> <p>show interfaces brief (ATM2, SONET Mode) on page 522</p> <p>show interfaces detail (ATM2, SONET Mode) on page 522</p> <p>show interfaces extensive (ATM2, SONET Mode) on page 524</p>
Output Fields	Table 93 on page 496 lists the output fields for the show interfaces (ATM) command. Output fields are listed in the approximate order in which they appear.

Table 93: ATM show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical interface	Name of the physical interface.	All levels

Table 93: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels

Table 93: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	All levels
CoS queues	Number of CoS queues configured.	detail extensive none
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 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	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 whose definitions are as follows: <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 OS 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 93: 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 so long in shared packet SDRAM 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. <p>NOTE: Physical interface queue counters of ATM2 PICs displayed by the show interfaces at-fpc/pic/port detail command show the packet forwarding stream statistics associated with the ATM2 ports. Since multiple ports of the ATM2 PICs (except for the ATM2 dual-port OC12) share one packet forwarding stream, the physical interface queue counters reflect the aggregate of ATM2 port statistics.</p>	detail extensive
SONET alarms SONET defects	<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

Table 93: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 • 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 93: 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 • 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
Received SONET overhead Transmitted 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. • 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-<i>N</i> 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-<i>N</i>. • Z3 and Z4—Allocated for future use. 	extensive
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

Table 93: 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
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 93: ATM 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
Received SDH overhead Transmitted SDH 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. • 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-<i>N</i> 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-<i>N</i>. • Z3 and Z4—Allocated for future use. 	extensive
Received path trace Transmitted path trace	<p>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 93: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
ATM Statistics	ATM statistics for the interface: <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 93: ATM 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. 	extensive
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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

Table 93: 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 93: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 inet , 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 inet.0 .	detail extensive
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Destination	IP address of the remote side of the connection.	detail extensive none

Table 93: ATM 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 none
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive
VCI	Virtual circuit identifier number and information: <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: <i>hh:mm:ss</i> or Never. • Last down—Time of last Down transition, using the format Last down: <i>hh:mm:ss</i>. • 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 93: 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
IMA group properties	<ul style="list-style-type: none"> • Version—The specified IMA specification version, either IMA 1.0 or IMA 1.1. • Frame length—Displays the specified frame size, which can be 32, 64, 128, or 256. • Differential delay—Maximum differential delay among links in milliseconds. • Symmetry—Either Common Transmit Clock or Independent Transmit Clock timing mode. • Transmit clock—The specified IMA clock mode, either common or independent. • Minimum links—The number of minimum active links specified in both transmit and receive directions. <ul style="list-style-type: none"> • Transmit—The per PIC limit on the number of minimum active links in the transmit direction. • Recieve—The per PIC limit on the number of minimum active links in the receive direction. • Frame synchronization—The specified IMA frame synchronization state transition variables (Alpha, Beta, and Gamma) and their specified values. <ul style="list-style-type: none"> • Alpha—The number of consecutive invalid ICP cells for IFSM. • Beta—The number of consecutive errored ICP cells for IFSM. • Gamma—The number of consecutive valid ICP cells for IFSM. • Links—The number of IMA links assigned to the IMA group. 	detail extensive none

Table 93: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
IMA group alarms	<ul style="list-style-type: none"> • Start-up-FE—Far-end group alarm status • Config-Aborted—Near-end configuration aborted group alarm status • Config-Aborted-FE—Far-end configuration aborted group alarm status • Insufficient-Links—Near-end insufficient links group alarm status • Insufficient-Links-FE—Far-end insufficient links group alarm status • Blocked-FE—Far-end blocked group alarm status • GR-Timing-Mismatch—Group timing mismatch alarm status 	detail extensive none
IMA group defects	<ul style="list-style-type: none"> • Start-up-FE—Far-end group defect status • Config-Aborted—Near-end configuration aborted group defect status • Config-Aborted-FE—Far-end configuration aborted group defect status • Insufficient-Links—Near-end insufficient links group defect status • Insufficient-Links-FE—Far-end insufficient links group defect status • Blocked-FE—Far-end blocked group defect status • GR-Timing-Mismatch—Group timing mismatch defect status 	detail extensive none
IMA Group state	Near-end and far-end group status	detail extensive none
IMA group media	IMA group media status, including seconds, count and state for the following media parameters: <ul style="list-style-type: none"> • FC • FC-FE • Addr-Mismatch • Running • UAS 	detail extensive none

```

show interfaces (ATM, IMA Group) user@host> show interfaces at-1/0/0
Physical interface: at-1/0/0, Enabled, Physical link is Up
IMA group properties:
  Version           : 1.1
  Frame length      : 128
  Differential delay : 25 milliseconds
  Symmetry          : Symmetrical Configuration and Operation
  Transmit clock    : Common
  Minimum links     : Transmit: 1, Receive: 1
  Frame synchronization: Alpha: 2, Beta: 2, Gamma: 1
  Links             : None
IMA group alarms : Start-up-FE Config-Aborted Config-Aborted-FE
Insufficient-Links Insufficient-Links-FE Blocked-FE GR-Timing-Mismatch
IMA group defects : Start-up-FE Config-Aborted Config-Aborted-FE
Insufficient-Links Insufficient-Links-FE Blocked-FE GR-Timing-Mismatch
IMA Group state:
  Near end : Start up
  Far end  : Start up
IMA group media:
  Seconds      Count  State
FC             0
FC-FE         0
Addr-Mismatch 0

```

```
Running          0
UAS              0
```

show interfaces
(ATM1, SONET Mode)

```
user@host> show interfaces at-1/0/0
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, SSONET 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 information:
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 extensive
(ATM2, SDH Mode) user@host> show interfaces at-0/2/1 extensive
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 (00:06:49 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 user@host> show interfaces at-0/3/1
(ATM2, SONET Mode) 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       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: 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	<pre>show interfaces at-pim/0/port <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers) 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><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 the 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 (ATM-over-ADSL) on page 530</p> <p>show interfaces brief (ATM-over-ADSL) on page 531</p> <p>show interfaces detail (ATM-over-ADSL) on page 532</p> <p>show interfaces extensive (ATM-over-ADSL) on page 533</p>
Output Fields	Table 94 on page 529 lists only output fields that are specific to the show interfaces (ATM-over-ADSL) command. For information about all other output fields, see Table 92 under the show interfaces (ATM) command.

Table 94: 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 94: ATM-over-ADSL show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
ADSL status	Operational information for ATM-over-ADSL interfaces. <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	Information about ADSL media-specific defects that can prevent the interface from passing packets. The following information is displayed for each defect: <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	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: <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:      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

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 extensive (ATM-over-ADSL) user@host> show interfaces at-5/0/0 extensive
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 18:34 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
  LOCDI        0      0 OK
  LOCDNI       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 information:
  CoS transmit queue      Bandwidth      Buffer      Priority      Limit
                           %      bps      %      usec
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	<pre>show interfaces at-pim/O/port <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers) Display status information about the specified ATM-over-symmetric high-speed DSL (SHDSL) interface.
Options	<p><i>at-pim/O/port</i>—Display standard information about the specified SHDSL 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>snmp-index</i></i>—(Optional) Display the 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 (ATM-over-SHDSL) on page 539</p> <p>show interfaces brief (ATM-over-SHDSL) on page 540</p> <p>show interfaces detail (ATM-over-SHDSL) on page 540</p> <p>show interfaces extensive (ATM-over-SHDSL) on page 542</p>
Output Fields	Table 95 on page 538 lists only output fields that are specific to the show interfaces (ATM-over-SHDSL) command. For information about all other output fields, see Table 92 under the show interfaces (ATM) command.

Table 95: 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—SHDLS 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. • Framer mode—Framer 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. • Framer sync status—Framer 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 95: 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)
                          Framers mode     : ATM
                          Dying gasp       : Enabled
                          Framers 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)
  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

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)
  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
Packet Forwarding Engine configuration:
  Destination slot: 4
CoS information:
  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
  Output bytes : 0
  Input packets: 0
  Output packets: 0
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
```

ILMI Interface Operational Mode Commands

Table 96 on page 545 summarizes the command-line interface (CLI) commands that 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 96: 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 OS Release 7.4.
Description	Set Integrated Local Management Interface (ILMI) statistics to zero.
Options	This command has no options.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show ilmi statistics on page 548
List of Sample Output	clear ilmi statistics on page 546
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 OS 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 547 show ilmi interface on page 547
Output Fields	Table 97 on page 547 lists the output fields for the show ilmi command. Output fields are listed in the approximate order in which they appear.

Table 97: 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 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

show ilmi interface 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

show ilmi statistics

Syntax	show ilmi statistics
Release Information	Command introduced before Junos OS 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 Documentation	<ul style="list-style-type: none">• clear ilmi statistics on page 546
List of Sample Output	show ilmi statistics on page 550
Output Fields	Table 98 on page 549 lists the output fields for the show ilmi statistics command. Output fields are listed in the approximate order in which they appear.

Table 98: 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.
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 553

ISDN Interface Operational Mode Commands

Table 99 on page 553 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot Integrated Services Digital Network (ISDN) interfaces. Commands are listed in alphabetical order.

Table 99: 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 Services Routers only. J Series 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 OS Release 7.4.
Description	(J Series routers 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 Documentation	<ul style="list-style-type: none">• show isdn q921 statistics on page 590
List of Sample Output	clear isdn q921 statistics on page 555
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 OS Release 7.4.
Description	(J Series routers 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 Documentation	<ul style="list-style-type: none">• show isdn q931 statistics on page 592
List of Sample Output	clear isdn q931 statistics on page 556
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 OS Release 7.4.
Description	(J Series routers 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 558
Output Fields	Table 100 on page 557 lists the output fields for the show dialer defaults command. Output fields are listed in the approximate order in which they appear.

Table 100: 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> <dnumber>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers 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. dnumber—(Optional) Display information about the specified dialer interface only.
Required Privilege Level	view
List of Sample Output	show dialer interfaces on page 560 show dialer interfaces brief on page 560 show dialer interfaces detail on page 560
Output Fields	Table 101 on page 559 lists the output fields for the show dialer interfaces command. Output fields are listed in the approximate order in which they appear.

Table 101: show dialer interfaces Output Fields

Field Name	Field Description	Level of Output
<i>Interface-name</i>	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

Table 101: show dialer interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 detail The output for the **show dialer interfaces detail** command is identical to that for the **show dialer interfaces** command. For sample output, see **show dialer interfaces** on page 560.

show dialer pools

Syntax	show dialer pools <brief | detail> <pool-name>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers 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 562 show dialer pools brief on page 562 show dialer pools detail on page 562
Output Fields	Table 102 on page 561 lists the output fields for the show dialer pools command. Output fields are listed in the approximate order in which they appear.

Table 102: 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.

show interfaces (ISDN B-Channel)

Syntax	<pre>show interfaces bc-pim/0/port:channel <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers 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><i>brief | detail | extensive | terse</i>—(Optional) Display the specified level of output.</p> <p><i>descriptions</i>—(Optional) Display the interface description string.</p> <p><i>media</i>—(Optional) Display media-specific information.</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>
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 566</p> <p>show interfaces brief (ISDN B-Channel) on page 567</p> <p>show interfaces detail (ISDN B-Channel) on page 567</p> <p>show interfaces extensive (ISDN B-Channel) on page 567</p>
Output Fields	Table 103 on page 563 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 103: 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 the “Enabled Fiel” section under “Common Output Fields Description” on page 111.	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 103: 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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link type	Data transmission type.	detail extensive none
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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 103: 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 OS 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
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. 	extensive

Table 103: ISDN B-Channel show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 extensive user@host> show interfaces bc-4/0/0:1 extensive
(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 (14:39:12 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 information:

```

CoS transmit queue	%	Bandwidth bps	%	Buffer usec	Priority	Limit
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	<pre>show interfaces br-pim/O/port <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers only) Display status information about the specified ISDN Basic Rate Interface (BRI) interface.
Options	<p><i>br-pim/O/port</i>—Display standard information about the specified ISDN BRI interface.</p> <p><i>brief | detail | extensive | terse</i>—(Optional) Display the specified level of output.</p> <p><i>descriptions</i>—(Optional) Display the interface description string.</p> <p><i>media</i>—(Optional) Display media-specific information.</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 (ISDN BRI) on page 571</p> <p>show interfaces brief (ISDN BRI) on page 572</p> <p>show interfaces detail (ISDN BRI) on page 572</p> <p>show interfaces extensive (ISDN BRI) on page 572</p>
Output Fields	Table 104 on page 569 lists the output fields for the show interfaces (ISDN BRI) command. Output fields are listed in the approximate order in which they appear.

Table 104: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 104: ISDN BRI 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 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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link type	Data transmission type.	detail extensive none
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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

Table 104: ISDN BRI show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 OS 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 extensive 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 OS Release 7.4.
Description	(J Series routers 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 576</p> <p>show interfaces brief (ISDN D-Channel) on page 576</p> <p>show interfaces detail (ISDN D-Channel) on page 577</p> <p>show interfaces extensive (ISDN D-Channel) on page 577</p>
Output Fields	Table 105 on page 573 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 105: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Interface index	Physical interface index number that reflects its initialization sequence.	detail extensive none

Table 105: 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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link type	Type of data transmission.	detail extensive none
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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 105: 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). • 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. • 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

Table 105: ISDN D-Channel show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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—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	<pre>show interfaces <i>dlnumber</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers 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 584</p> <p>show interfaces brief (ISDN Dialer) on page 585</p> <p>show interfaces detail (ISDN Dialer) on page 585</p> <p>show interfaces extensive (ISDN Dialer) on page 586</p>
Output Fields	Table 106 on page 579 lists the output fields for the show interfaces (ISDN dialer) command. Output fields are listed in the approximate order in which they appear.

Table 106: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 106: 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 106: 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 OS 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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels

Table 106: 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

Table 106: ISDN Dialer show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Keepalive settings	<p>Configured settings for keepalives.</p> <ul style="list-style-type: none"> interval <i>seconds</i>—Time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. up-count <i>number</i>—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 <i>number</i>—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 106: 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 inet , 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 inet.0 .	detail extensive
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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, 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 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 OS Release 7.4.
Description	(J Series routers only) Display ISDN connection calls.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show isdn calls on page 588
Output Fields	Table 107 on page 588 lists the output fields for the show isdn calls command. Output fields are listed in the approximate order in which they appear.

Table 107: 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, Dialin call, 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 OS Release 7.4.
Description	(J Series routers only) Display ISDN call history.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show isdn history on page 589
Output Fields	Table 108 on page 589 lists the output fields for the show isdn history command. Output fields are listed in the approximate order in which they appear.

Table 108: 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	<code>show isdn q921 statistics br-pim/0/port</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers only) Display ISDN Layer 2 statistics based on the Q.921 standard for the specified Basic Rate Interface (BRI) interface.
Options	<code>br-pim/0/port</code> —Basic Rate Interface (BRI) interface name.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> clear isdn q921 statistics on page 555
List of Sample Output	show isdn q921 statistics on page 590
Output Fields	Table 109 on page 590 lists the output fields for the show isdn q921 statistics command. Output fields are listed in the approximate order in which they appear.

Table 109: 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	<code>show isdn q931 statistics br-pim/0/port</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(J Series routers only) Display ISDN Layer 3 statistics based on the Q.931 standard for the specified Basic Rate Interface (BRI) interface.
Options	<code>br-pim/0/port</code> —Basic Rate Interface (BRI) interface name.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear isdn q931 statistics on page 556
List of Sample Output	show isdn q931 statistics on page 594
Output Fields	Table 110 on page 593 lists the output fields for the show isdn q931 statistics command. Output fields are listed in the approximate order in which they appear.

Table 110: 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.

```

show isdn q931 statistics 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 OS Release 7.4.
Description	(J Series routers 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 595
Output Fields	Table 111 on page 595 lists the output fields for the show isdn status command. Output fields are listed in the approximate order in which they appear.

Table 111: 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 599
- Channelized OC Interface Operational Commands on page 617
- Channelized STM1 Interface Operational Mode Commands on page 649
- Channelized T1 and T3 Interface Operational Mode Commands on page 669

Channelized E1 Interface Operational Mode Commands

Table 112 on page 599 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot channelized E1 interfaces. Commands are listed in alphabetical order.

Table 112: 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 OS Network Interfaces Configuration Guide*.

For channelization illustrations and configuration examples for channelized IQ interfaces, see the *Junos Feature Guide*.

show interfaces (Channelized E1)

Syntax	<pre>show interfaces ds-fpc/pic/port:ds0channel <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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><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 (Channelized E1) on page 609
Output Fields	Table 113 on page 600 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 113: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 113: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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. 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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 <i>seconds</i>—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>—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>—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 113: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Keepalive statistics	<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) 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: 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) 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: 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 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 113: 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 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 113: 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 OS 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

Table 113: Channelized E1 and Channelized E1 IQ 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 (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
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

Table 113: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Interface transmit queues	<p>Names of the transmit queues and their associated statistics for each DSO channel on the Channelized E1 to DSO 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 E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
DSx 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. 	extensive
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> • CoS transmit queue—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: 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.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels
Input packets	Number of packets received on the logical interface.	None specified

Table 113: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 one 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 extensive
(Channelized E1)
user@host> show interfaces ds-0/1/1:1 extensive
Physical interface: ds-0/1/1:1, Enabled, Physical link is Down
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 information:

```

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	<pre>show interfaces (ce1-fpc/pic/port | type-fpc/pic/port<:channel>) <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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, type is ce. For the clear channel, type is e1. At the first level of channelization, type is ds.</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 (Channelized E1 IQ) (Physical) on page 611</p> <p>show interfaces extensive (Channelized E1 IQ Multilink PPP Encapsulation) on page 612</p> <p>show interfaces extensive (Channelized E1 IQ MLFR Encapsulation) on page 613</p> <p>show interfaces detail (Clear Channel E1) on page 614</p>
Output Fields	For information about output fields, see the output field table for the show interfaces (Channelized E1) 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: cel-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 timeout : 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
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 (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 user@host> show interfaces e1-1/2/6 detail
(Clear Channel E1) 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	<code>show interfaces controller ce1-fpc/pic/port</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display the interface names of the physical channelized E1 IQ interface and the channels configured on each interface.
Options	<code>ce1-fpc/pic/port</code> —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 615 show interfaces controller (Channelized E1 IQ with Logical DS0) on page 615
Output Fields	Table 114 on page 615 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 114: 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)	user@host> show interfaces controller ce1-1/2/6			
	Controller		Admin	Link
	ce1-1/2/6		up	up
	e1-1/2/6		up	up
show interfaces controller (Channelized E1 IQ with Logical DS0)	user@host> show interfaces controller ce1-1/2/3			
	Controller		Admin	Link
	ce1-1/2/3		up	up
	ds-1/2/3:1		up	up
	ds-1/2/3:2		up	up

Channelized OC Interface Operational Commands

Table 115 on page 617 summarizes the command-line interface (CLI) commands to monitor and troubleshoot channelized OC interfaces. Commands are listed in alphabetical order.

Table 115: 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	<pre>show interfaces (<i>type-fpc/pic/port <:channel><:channel><:channel></i>) <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the specified channelized OC3 IQ or IQE interface.
Options	<p><i>type-fpc/pic/port:channel: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</i>—For the physical interface, type is coc3. For the clear channel, type is so (for OC3). <i>type-fpc/pic/port:channel</i>—At the first level of channelization, type can be coc1 (channelized OC1), ct3 (from coc1), or t3 (from coc1). <i>type-fpc/pic/port:channel:channel</i>—At the second level of channelization, type can be ct1 (from coc1 or ct3) or t1 (from coc1 or ct3). <i>type-fpc/pic/port:channel:channel:channel</i>—At the third level of channelization, type can be ds (from ct1). <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 (Channelized OC3 IQ) (Physical) on page 632</p> <p>show interfaces extensive (Channelized OC1 on Channelized OC3 IQ) on page 633</p> <p>show interfaces extensive (Channelized T1 on Channelized OC3 IQ) on page 634</p> <p>show interfaces extensive (DSO on Channelized OC3 IQ) on page 635</p>
Output Fields	Table 116 on page 619 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 116: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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
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
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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	All levels
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.	detail extensive

Table 116: 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, value... nn</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) 	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: nn (last sent 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
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
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

Table 116: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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>Elor 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. See the following list for 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

Table 116: 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 116: 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 OS 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 116: 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 116: 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 116: 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 116: 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	NOTE: For controller based SONET PICs, the SDH alarms and SDH defects output in the show interface coc3 extensive command output only shows the section and line level defects. The path level defects can be found under the SONET (so) interface 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 116: 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 116: 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-<i>N</i> 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-<i>N</i>. • 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 116: 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 116: Channelized OC 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. 	extensive
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
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. <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

Table 116: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 , inet6 , or mpls .	detail extensive none
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 the "Addresses Flags" section under "Common Output Fields Description" on page 111.	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
ES            18
SES           18
SEFS          18
BES           0
UAS           14
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 (DSO on
Channelized OC3 IQ)**

```

user@host> show interfaces extensive ds-0/0/0:1:1
Physical interface: ds-0/0/0:1:1, 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 OS Release 7.4.
Description	Display status information about the specified channelized OC12 interface.
Options	<p><i>t3-fpc/pic/port:t3channel</i>—Display standard information about the specified channelized OC12 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 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 OC12) on page 637
Output Fields	See the output field table for the show interfaces (Channelized OC3 IQ and IQE) command.
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 information:
  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 OS Release 7.4.

Description (M Series and T Series routers 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 or `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`—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	<p><code>show interfaces extensive</code> (CAU4 on Channelized OC-12 IQ) on page 642</p> <p><code>show interfaces extensive</code> (Channelized OC1 on Channelized OC12 IQ) on page 642</p> <p><code>show interfaces extensive</code> (Channelized OC12 IQ) (Physical) on page 642</p> <p><code>show interfaces extensive</code> (Channelized T1 from Channelized OC12 IQ) on page 643</p> <p><code>show interfaces extensive</code> (Channelized T3 on Channelized OC12 IQ) on page 643</p> <p><code>show interfaces extensive</code> (CSTM4 on Channelized OC-12 IQ) on page 643</p> <p><code>show interfaces extensive</code> (DS0 on Channelized OC12 IQ) on page 643</p> <p><code>show interfaces extensive</code> (SONET Interface on Channelized OC12 IQ) on page 643</p> <p><code>show interfaces extensive</code> (T1 on Channelized OC12 IQ) on page 644</p>
Output Fields	See the output field table for the <code>show interfaces</code> (Channelized OC3 IQ and IQE) command.
<code>show interfaces extensive</code> (CAU4 on Channelized OC-12 IQ)	<pre> 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 ... </pre>
<code>show interfaces extensive</code> (Channelized OC1 on Channelized OC12 IQ)	<pre> 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 ... </pre>
<code>show interfaces extensive</code> (Channelized OC12 IQ) (Physical)	<pre> 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 ... </pre>

show interfaces extensive (Channelized T1 from Channelized OC12 IQ)	<pre> user@host> show interfaces extensive ct1-4/2/0:7:1 Physical interface: ct1-4/2/0:4:1, Enabled, Physical link is Up Interface index: 305, SNMP ifIndex: 2410, Generation: 640 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 ... </pre>
show interfaces extensive (Channelized T3 on Channelized OC12 IQ)	<pre> user@host> show interfaces ct3-0/2/0:1 extensive Physical interface: ct3-0/2/0:1:1, Enabled, Physical link is Up Interface index: 220, SNMP ifIndex: 140, Generation: 222 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 ... </pre>
show interfaces extensive (CSTM4 on Channelized OC-12 IQ)	<pre> user@host> show interfaces cstm4-0/2/0 extensive Physical interface: cstm4-0/2/0, Enabled, Physical link is Up 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 ... </pre>
show interfaces extensive (DS0 on Channelized OC12 IQ)	<pre> user@host> show interfaces extensive ds-4/2/0:7:1:1 Physical interface: ds-4/2/0:4:1:1, Enabled, Physical link is Up 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 ... </pre>
show interfaces extensive (SONET Interface on Channelized OC12 IQ)	<pre> user@host> show interfaces so-0/2/0:1 extensive Physical interface: so-0/2/0:1, Enabled, Physical link is Up Interface index: 750, SNMP ifIndex: 23, Generation: 11709 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 ... </pre>

```
show interfaces extensive (T1 on Channelized OC12 IQ) user@host> show interfaces t1-0/2/0:1:1 extensive
Physical interface: t1-0/2/0:1:1:1, Enabled, Physical link is Up
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	<code>show interfaces controller coc3-fpc/pic/slot</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display a list of channels configured on a channelized OC3 IQ and IQE interface.
Options	<code>coc3-fpc/pic/slot</code> —channelized OC3 IQ or IQE interface name.
Required Privilege Level	view

List of Sample Output `show interfaces controller (Channelized OC3 IQ)` on page 645

Output Fields Table 117 on page 645 lists the output fields for the `show interfaces controller (Channelized OC3 IQ)` command. Output fields are listed in the approximate order in which they appear.

Table 117: 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>	<table border="0"> <tr> <td>Admin</td> <td>Link</td> </tr> <tr> <td>up</td> <td>up</td> </tr> <tr> <td>up</td> <td>up</td> </tr> <tr> <td>up</td> <td>up</td> </tr> <tr> <td>up</td> <td>up</td> </tr> <tr> <td>up</td> <td>up</td> </tr> <tr> <td>up</td> <td>up</td> </tr> <tr> <td>up</td> <td>up</td> </tr> </table>	Admin	Link	up	up	up	up	up	up	up	up	up	up	up	up	up	up
Admin	Link																	
up	up																	
up	up																	
up	up																	
up	up																	
up	up																	
up	up																	
up	up																	

show interfaces controller (Channelized OC12 IQ and IQE)

Syntax show interfaces controller coc12-*fpc/pic/port*

Release Information	Command introduced before Junos OS 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 646

Output Fields Table 118 on page 646 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 118: 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 (Channelized OC12 IQ)	user@host> show interfaces controller Controller	Admin	Link
	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

```


Channelized STM1 Interface Operational Mode Commands

Table 119 on page 649 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot channelized STM1 interfaces. Commands are listed in alphabetical order.

Table 119: 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	<pre>show interfaces e1-fpc/pic/port:elchannel <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the specified channelized STM1 interface.
Options	<p><i>e1-fpc/pic/port:elchannel</i>—Display standard status information about the specified channelized STM1 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 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 STM1, SDH) on page 661
Output Fields	Table 120 on page 650 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 120: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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

Table 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Keepalive statistics	<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
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...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) 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 120: 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	<p>(Frame Relay, displayed only from the DTE) Number of DLCIs configured from the DCE.</p>	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	<p>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).</p>	detail extensive none

Table 120: 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 OS 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

Table 120: Channelized STM1 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. 	extensive
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> <p>NOTE: For controller-based SONET PICs, the SDH alarms and SDH defects output in the show interface cstm1 extensive command output only shows the section and line level defects. The path level defects can be found under the SONET (so) interface output.</p>	All levels

Table 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Interface transmit queues	<p>Names of the transmit queues and their associated statistics for each E1 channel on the Channelized STM1-to-E1 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
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 encoding—Line encoding used. It is always HDB3. 	extensive

Table 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 120: Channelized STM1 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 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Received SDH overhead Transmitted SDH 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. • 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-<i>N</i> 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-<i>N</i> signal. • Z3 and Z4—Allocated for future use. 	extensive
Received path trace Transmitted path trace	<p>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.</p>	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. • PLP byte—Packet Level Protocol byte. 	extensive

Table 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	detail extensive none

Table 120: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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	<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 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	<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 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 information:
  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	<pre>show interfaces (type-fpc/pic/port <:channel><:channel>) <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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 types:</p> <ul style="list-style-type: none"> • <i>type-fpc/pic/port:channel</i>—For the physical channelized STM1 IQ interface, type is cstm1. For the clear channel, type is so. For channelization, the STM1 IQ interface must be converted to interface type cau4. • <i>type-fpc/pic/port:channel</i>—At the first level of channelization, type can be ce1 or e1 (clear channel or fractional channel from cau4). • <i>type-fpc/pic/port:channel:channel</i>—At the second level of channelization, type is ds (from ce1). <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	<pre>show interfaces (Channelized STM1 IQ) (Physical) on page 665 show interfaces (Channelized AU-4) (Physical) on page 666 show interfaces (Channelized E1) (Physical) on page 666 show interfaces (DS) on page 667</pre>
Output Fields	See the output field table for the show interfaces (Channelized STM1) command.
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
  CoS Queues: 8 maximum usable queues, 4 in use
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 0 (never), Output: 0 (never)
  LCP state: Conf-req-sent
  Egress queues: 8 supported, 4 in use
...
  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
...

```


Channelized T1 and T3 Interface Operational Mode Commands

Table 122 on page 669 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot channelized T1 and T3 interfaces. Commands are listed in alphabetical order.

Table 122: 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	<pre>show interfaces ds-fpc/pic/port:t1channel:ds0channel <brief | detail | extensive> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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 679
Output Fields	Table 123 on page 671 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 123: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 123: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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	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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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 that 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 123: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Keepalive statistics	<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) 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, 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 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 seen hh:mm:ss 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 123: 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</i> 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 123: 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 OS 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 123: 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 123: 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 123: 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. 	extensive
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> • CoS transmit queue—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: 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.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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

Table 123: Channelized DS3 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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      user@host> show interfaces ds-0/0/0:0:0 extensive
extensive (Channelized Physical interface: ds-0/0/0:0:0, Enabled, Physical link is Up
DS3-to-DS0)         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 information:   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 OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the specified channelized DS3-to-DS1 interface.
Options	<p><i>t1-fpc/pic/port:t1channel</i>—Display standard information about the specified channelized DS3-to-DS1 interface.</p> <p><i>brief | detail | extensive | terse</i>—(Optional) Display brief interface information.</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-DS1) on page 682
Output Fields	See the output field table for the show interfaces (Channelized DS3-to-DS0) command.
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 Traffic statistics:</pre>


```

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 information:
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	<pre>show interfaces (ct1-fpc/pic/port | type-fpc/pic/port<:channel><:channel>) <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced in Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the specified channelized T1 IQ interface.
Options	<p><i>type-fpc/pic/port: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</i>—For the physical channelized T1 IQ interface, type is ct1. • <i>type-fpc/pic/port:channel</i>—For the clear channel, type is t1. At the first level of channelization, type can be ct1 or t1. • <i>type-fpc/pic/port:channel:channel</i>—At the second level of channelization, type can be ds. <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	<pre>show interfaces extensive (CT1) on page 693 show interfaces extensive (T1) on page 694 show interfaces extensive (DS0) on page 695</pre>
Output Fields	Table 124 on page 685 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 124: 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 124: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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 124: 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: 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 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 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
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 124: Channelized T1 IQ and T3 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 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
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

Table 124: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 OS 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

Table 124: Channelized T1 IQ and T3 IQ 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. • MTU errors—Number of packets whose size exceeds 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
DS1 alarms DS1 defects	<p>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.</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 124: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
T1 media	<p>Counts of T1 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 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
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: 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

Table 124: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
DSO or 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. 	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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

Table 124: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 extensive (CT1) user@host> show interfaces extensive ct1-0/1/1
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:
    Seconds      Count  State
    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 extensive (T1) user@host> show interfaces extensive t1-0/2/0
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 timeout : 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 extensive ds-0/1/0:0
extensive (DS0) user@host> show interfaces extensive ds-0/1/0:0
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
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-0/1/0:1.0 (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	<pre>show interfaces (ct3-fpc/pic/port | type-fpc/pic/port<:channel><:channel>) <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the specified channelized T3 IQ interface.
Options	<p><i>type-fpc/pic/port: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</i>—For the physical channelized T3 IQ interface, type is ct3. • <i>type-fpc/pic/port:channel</i>—For the clear channel, type is t3. At the first level of channelization, type can be ct1 or t1. • <i>type-fpc/pic/port:channel:channel</i>—At the second level of channelization, type is ds. <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 extensive (Channelized T3 IQ) (Physical) on page 698</p> <p>show interfaces extensive (Channelized T1 on Channelized T3 IQ) on page 698</p> <p>show interfaces extensive (DSO on Channelized T3 IQ) on page 698</p>
Output Fields	See the output field table for the show interfaces (Channelized T1 IQ) command.

show interfaces extensive (Channelized T3 IQ) (Physical)	<pre>user@host> show interfaces extensive ct3-0/0/1 Physical interface: ct3-0/0/1, Enabled, Physical link is Up 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 extensive (Channelized T1 on Channelized T3 IQ) user@host> show interfaces extensive ct1-0/0/1:2 Physical interface: ct1-0/0/1:2, Enabled, Physical link is Up Interface index: 175, SNMP ifIndex: 1505, Generation: 174 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 extensive (DS0 on Channelized T3 IQ) user@host> show interfaces extensive ds-0/0/1:2:1 Physical interface: ds-0/0/1:2:1, Enabled, Physical link is Up 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 ...</pre>
---	---

show interfaces controller (Channelized T1 IQ)

Syntax	<code>show interfaces controller ct1-fpc/pic/slot</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display the interface names of the specified physical channelized T1 IQ interface and the channels configured on it.
Options	<code>ct1-fpc/pic/slot</code> —Channelized T1 IQ interface name.
Required Privilege Level	view
List of Sample Output	show interfaces controller (T1 IQ) (Clear-Channel T1) on page 699 show interfaces controller (T1 IQ) (Channelized DS) on page 699
Output Fields	Table 125 on page 699 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 125: 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	<code>show interfaces controller ct3-fpc/pic/slot</code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display the interface names of the specified physical channelized T3 IQ interface and the channels configured on it.
Options	<code>ct3-fpc/pic /slot</code> —Channelized T3 IQ interface name.
Required Privilege Level	view
List of Sample Output	show interfaces controller (T3 IQ) on page 700
Output Fields	Table 126 on page 700 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 126: 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)	<pre> user@host> show interfaces controller ct3-0/0/1 Controller ct3-0/0/1 t1-0/0/1:1 ct1-0/0/1:2 ds-0/0/1:2:1 ds-0/0/1:2:2 ds-0/0/1:2:3 t1-0/0/1:3 ... t1-0/0/1:10 ct1-0/0/1:11 ... ct1-0/0/1:28 </pre>	<pre> Admin Link up up up up up up up up up up up up up up up up up down up up up up up up up up </pre>
---	---	--

PART 11

Services Interfaces

- Adaptive Services Interface Operational Mode Commands on page 703
- Encryption Interface Operational Mode Commands on page 717
- Flow Collector and Monitoring Interface Operational Mode Commands on page 725
- Link Services Interface Operational Mode Commands on page 741
- Tunnel Services Interface Operational Mode Commands on page 793
- VoIP Interface Operational Mode Commands on page 823

Adaptive Services Interface Operational Mode Commands

Table 127 on page 703 summarizes the command line interface (CLI) commands that you can use to monitor and troubleshoot adaptive services operations.


Table 127: Adaptive Services Interface Operational Mode Commands

Task	Command
(M Series and T Series routers only) Manually revert to the primary adaptive services interface or link services IQ interface, or to switch from the primary to the secondary interface.	request interface (revert | switchover) (Adaptive Services)
Display status information about the specified adaptive services interface.	show interfaces (Adaptive Services)
(M Series and T Series routers only) Display status information about the specified redundant adaptive services configuration.	show interfaces (Redundant Adaptive Services)
(M series, T Series, and MX Series routers only) Display general information about adaptive services and link services intelligent queuing (IQ) interfaces redundancy.	show interfaces redundancy



NOTE: For information about how to configure adaptive services, see the *Junos Services Interfaces Configuration Guide*.

request interface (revert | switchover) (Adaptive Services)

Syntax	request interface (revert | switchover) (<i>rspnumber</i> | <i>rlsnumber</i>)
Release Information	Command introduced before Junos OS Release 7.4. Support for rlsq interfaces added in Junos OS Release 7.6.
Description	(M Series and T Series routers only) Manually revert to the primary adaptive services interface or link services IQ interface, or to switch from the primary to the secondary interface.
	<div>  <p>NOTE: All rlsq switchover or revert operations are allowed from the rlsnumber level only and not for individual channelized interfaces (rlsnumber:unit).</p> </div>
	<p>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).</p>
Options	<p>(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.</p> <p><i>rspnumber</i>—Redundant adaptive services interface name.</p> <p><i>rlsnumber</i>—Redundant link services IQ interface name.</p>
Required Privilege Level	view
List of Sample Output	<p>request interface revert on page 704</p> <p>request interface switchover on page 704</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request interface revert	<pre>user@host> request interface revert rlsq0 request succeeded</pre>
request interface switchover	<pre>user@host> request interface switchover rlsq0 error: rlsq0: already on secondary</pre>

show interfaces (Adaptive Services)

Syntax	<pre>show interfaces <i>interface-type</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS 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 routers, the interface type is sp-<i>fpc/pic/port</i>. On J Series routers, the interface type is sp-<i>pim/O/port</i>.</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 (Adaptive Services) on page 710</p> <p>show interfaces brief (Adaptive Services) on page 710</p> <p>show interfaces detail (Adaptive Services) on page 710</p> <p>show interfaces extensive (Adaptive Services) on page 711</p>
Output Fields	Table 128 on page 705 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 128: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 128: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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 the "Link Flags" section under "Common Output Fields Description" on page 111.	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

Table 128: 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 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—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 OS 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

Table 128: Adaptive Services and Redundant Adaptive Services show interfaces Output Fields (continued)

Field Name	Field Description	Level of Output
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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>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 inet , the IP address of the interface is 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 the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Destination	IP address of the remote side of the connection.	detail extensive none

Table 128: Adaptive Services and Redundant Adaptive Services 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 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
                        Output bytes  :         1483113
                        Input packets:           3061

```

```

Output packets:          3048
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, Runt: 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 OS Release 7.4.
Description	(M Series and T Series routers 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>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 (Redundant Adaptive Services) on page 713
Output Fields	See the output field table for the show interfaces (Adaptive Services) command.
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 Output packets: 0 0 pps</pre>

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 <brief | detail>
Release Information	Command introduced before Junos OS Release 7.4. detail option added in Junos OS Release 10.0.
Description	(M Series, T Series, and MX Series routers only) Display general information about adaptive services and link services intelligent queuing (IQ) interfaces and aggregated Ethernet interfaces redundancy.
Options	brief | detail—(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	show interfaces redundancy on page 716 show interfaces redundancy (Aggregated Ethernet) on page 716 show interfaces redundancy detail on page 716
Output Fields	Table 129 on page 715 lists the output fields for the show interfaces redundancy command. Output fields are listed in the approximate order in which they appear.

Table 129: show interfaces redundancy Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the redundant adaptive services, link services IQ interfaces, or aggregated Ethernet interfaces.	All levels
State	State of the redundant interface: Not present , On primary , or On secondary .	All levels
Last Change	Timestamp for the last change in status. This value resets after a master Routing Engine switchover event if any of the following conditions is met: <ul style="list-style-type: none"> • GRES is not configured on the router. • The rlsq interface is configured without the hot-standby or warm-standby statements and the backup lsq interface was active before the switchover. • No logical interfaces are configured or all of the configured logical interfaces are down at the time of the switchover. 	All levels
Primary	Name of the interface configured to be the primary interface.	All levels
Secondary	Name of the interface configured to be the backup interface.	All levels
Current Status	Physical status of the primary and secondary interfaces.	All levels
Mode	Standby mode.	detail

show interfaces redundancy**redundancy**

```

user@host> show interfaces redundancy
Interface State      Last change Primary Secondary Current status
rsp0      Not present
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   lsq-0/3/0   lsq-1/0/0   both up

```

**show interfaces
redundancy
(Aggregated Ethernet)**

```

user@host> show interfaces redundancy
Interface State      Last change Primary Secondary Current status
rlsq0     On secondary 00:56:12   lsq-4/0/0   lsq-3/0/0   both up

ae0
ae1
ae2
ae3
ae4

```

**show interfaces
redundancy detail**
user@host> show interfaces redundancy detail

```

Interface      : rlsq0
State          : On primary
Last change    : 00:45:47
Primary        : lsq-0/2/0
Secondary      : lsq-1/2/0
Current status : both up
Mode           : hot-standby

Interface      : rlsq0:0
State          : On primary
Last change    : 00:45:46
Primary        : lsq-0/2/0:0
Secondary      : lsq-1/2/0:0
Current status : both up
Mode           : warm-standby

```

CHAPTER 20

Encryption Interface Operational Mode Commands

Table 130 on page 717 summarizes the command-line interface (CLI) command that you can use to monitor and troubleshoot encryption interfaces.

Table 130: Encryption Interface Operational Mode Commands

Task	Command
Display status information about encryption interfaces.	show interfaces (Encryption)

show interfaces (Encryption)

Syntax	<pre>show interfaces es-fpc/pic/port:channel <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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><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 (Encryption) on page 721</p> <p>show interfaces brief (Encryption) on page 721</p> <p>show interfaces detail (Encryption) on page 721</p> <p>show interfaces extensive (Encryption) on page 722</p>
Output Fields	Table 131 on page 718 lists the output fields for the show interfaces (ES) command. Output fields are listed in the approximate order in which they appear.

Table 131: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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: 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 the "Link Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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

Table 131: Encryption 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 logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 inet , 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 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 the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.Address	detail extensive none

Table 131: Encryption show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
```


Flow Collector and Monitoring Interface Operational Mode Commands

Table 132 on page 725 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot flow collector and flow monitoring interfaces. Commands are listed in alphabetical order.

Table 132: 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	<pre>show interfaces dfc-fpc/pic/port:channel <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced in Junos OS Release 7.4.
Description	(M320 and M120 routers and T Series routers 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><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 (Dynamic Flow Capture) on page 729
Output Fields	Table 133 on page 726 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 133: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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

Table 133: Dynamic Flow Capture 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 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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link type	Data transmission type.	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	All levels
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
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	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <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 OS does not support. • Resource errors—Sum of transmit drops. 	extensive

Table 133: 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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 iso or inet6).	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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Addresses associated with the logical interface and information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	detail extensive none

Table 133: Dynamic Flow Capture show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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      Physical interface: dfc-0/0/0, Enabled, Physical link is Up
Capture)          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	<pre>show interfaces <i>cp-fpc/pic/port:channel</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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><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 (Flow Collector) on page 734
Output Fields	Table 134 on page 730 lists the output fields for the show interfaces (Flow Collector) command. Output fields are listed in the approximate order in which they appear.

Table 134: 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 the "Enabled Devices" section under "Common Output Fields Description" on page 111.	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 134: Flow Collector 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 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link type	Data transmission type.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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 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 134: 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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 134: 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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	<pre>show interfaces mo-fpc/pic/port:channel <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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><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 (Flow Monitoring) on page 739
Output Fields	Table 135 on page 736 lists the output fields for the show interfaces (Flow Monitoring) command. Output fields are listed in the approximate order in which they appear.

Table 135: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 135: Flow Monitoring 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
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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link type	Data transmission type.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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: <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 135: Flow Monitoring 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 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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels

Table 135: Flow Monitoring 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. 	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 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	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)

...

Link Services Interface Operational Mode Commands

Table 136 on page 741 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot link services, link services IQ, and multilink services interfaces.

Table 136: 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 OS Release 7.4.

Description Display status information about the specified link services interface.

Options *interface-type*—On M Series and T Series routers, the interface type is **ls-*fpc/pic/port***. On J Series routers, the interface type is **ls-*pim/O/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 750**
show interfaces extensive (MFR End-to-End) on page 752

Output Fields Table 137 on page 742 lists the output fields for the **show interfaces** (link services) command. Output fields are listed in the approximate order in which they appear.

Table 137: 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 137: Link Services show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	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 the “Link Flags” section under “Common Output Fields Description” on page 111.	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 137: 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 137: 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. • interface-name—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

Table 137: 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_lnk—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. lnk_ack—ADD_LINK_ACK message notifies the peer that the local router has received a valid ADD_LINK message. lnk_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. lnk_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 137: 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 occurred 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—Frame was received 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 137: 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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Encapsulation	Encapsulation being used: PPP, Multilink - FR or Multilink - PPP	All levels
Bandwidth	Speed at which the interface is running.	All levels
Bundle options	For 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 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)	Information about bundle status: <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 137: 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
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

Table 137: Link 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
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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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	<code>show interfaces lsq-fpc/pic/port</code> <code><brief | detail | extensive | terse></code> <code><descriptions></code> <code><media></code> <code><snmp-index <i>snmp-index</i>></code> <code><statistics></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the specified link services intelligent queuing (IQ) interface.
Options	<p><code>lsq-fpc/pic/port</code>—Display standard status information about the specified link services IQ interface.</p> <p><code>brief | detail | extensive | terse</code>—(Optional) Display the specified level of output.</p> <p><code>descriptions</code>—(Optional) Display interface description strings.</p> <p><code>media</code>—(Optional) Display media-specific information about network interfaces.</p> <p><code>snmp-index <i>snmp-index</i></code>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><code>statistics</code>—(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><code>show interfaces extensive</code> (MLPPP on Link Services IQ) on page 766</p> <p><code>show interfaces extensive</code> (MC-MLPPP on Link Services IQ) on page 767</p> <p><code>show interfaces extensive</code> (MLPPP on Link Services IQ Bundle) on page 769</p>
Output Fields	Table 138 on page 755 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 138: show interfaces (Link Services IQ) 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Interface index	Physical interface's index number, which reflects its initialization sequence.	detail extensive none

Table 138: show interfaces (Link Services IQ) 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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	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 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 138: show interfaces (Link Services IQ) 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 138: show interfaces (Link Services IQ) 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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Encapsulation	Encapsulation being used: PPP or Multilink PPP.	All levels
Bandwidth	Speed at which the interface is running.	All levels

Table 138: show interfaces (Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bundle options	<p>(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 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 138: show interfaces (Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bundle status (MLPPP) or Multilink class status (MC-MLPPP)	Information about bundle status: <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 138: show interfaces (Link Services IQ) 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the addresses configured on the logical interface. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Destination	IP address of the remote side of the connection.	detail extensive none

Table 138: show interfaces (Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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

Table 138: show interfaces (Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bundle options	<p>(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 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. • 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 138: show interfaces (Link Services IQ) 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 occurred 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—A frame was received 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 138: show interfaces (Link Services IQ) 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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 138: show interfaces (Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Generation	Unique number for use by Juniper Networks technical support.	detail extensive
show interfaces extensive (MLPPP on Link Services IQ)	<pre> 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 </pre>	

```

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:
Multilink:
  Input :                    79827      239      9593009     232288
  Output:                    77533      234      9811743     238056
Network:
  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], Maximum labels: 3
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	<pre>show interfaces ml-fpc/pic/port <brief | detail | extensive | terse> <descriptions> <media> <snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers 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 777
Output Fields	Table 139 on page 771 lists the output fields for the show interfaces (Multilink Services) command. Output fields are listed in the approximate order in which they appear.

Table 139: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 139: Multilink Services show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Link-level type	Encapsulation being used on the physical interface: Multilink .	All levels
MTU	MTU size on the physical interface.	All levels
Device flags	Information about the physical device. Possible values are described in the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	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
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 139: 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 occurred 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—Frame was received 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 139: 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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	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 139: 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 139: 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 139: Multilink 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

```

show interfaces      user@host> show interfaces ml-0/3/0 extensive
extensive (Multilink Physical interface: ml-0/3/0, Enabled, Physical link is Up
Services)           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
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 OS Release 7.6.
Description	(M Series and T Series routers only) Display status information about the specified redundant link services intelligent queuing (IQ) configuration.
Options	<p><i>rlsqnumber</i>—Redundant link services IQ interface name. The logical interface number range of values is 0 through 127.</p> <p><i>none</i>—Display standard status information about the specified redundant link services IQ 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>queue</i>—(Optional) Display queue information about network interfaces.</p> <p><i>routing</i>—(Optional) Display routing 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 (Redundant Link Services IQ) on page 790</p> <p>show interfaces brief (Redundant Link Services IQ) on page 790</p> <p>show interfaces detail (Redundant Link Services IQ) on page 790</p> <p>show interfaces extensive (Redundant Link Services IQ) on page 792</p>
Output Fields	Table 140 on page 779 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.

Table 140: show interfaces (Redundant Link Services IQ) Output Fields

Field Name	Field Description	Level of Output
Physical Interface		

Table 140: show interfaces (Redundant Link Services IQ) 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 the "Enabled Field" section under "Common Output Fields Description" on page 111.	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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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

Table 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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

Table 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Hardware errors (sticky)	<p>(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. 	extensive
Egress queues	Total number of egress queues supported on the specified interface.	detail extensive none

Table 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bundle status (MLPPP) or Multilink class status (MC-MLPPP)	Information about bundle status: <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 140: show interfaces (Redundant Link Services IQ) 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the addresses configured on the logical interface. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Destination	IP address of the remote side of the connection.	detail extensive none

Table 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	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

Table 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bundle options	<p>(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 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. • 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 140: show interfaces (Redundant Link Services IQ) 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 occurred 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—A frame was received 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 140: show interfaces (Redundant Link Services IQ) 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 the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 140: show interfaces (Redundant Link Services IQ) Output Fields (*continued*)

Field Name	Field Description	Level of Output
Generation	Unique number for use by Juniper Networks technical support.	detail extensive
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 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 </pre>	
show interfaces brief (Redundant Link Services IQ)	<pre> 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 </pre>	
show interfaces detail (Redundant Link Services IQ)	<pre> 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 </pre>	

```

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 790.

Tunnel Services Interface Operational Mode Commands

Table 141 on page 793 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot tunnel services interfaces. Commands are listed in alphabetical order.

Table 141: 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	<pre>show interfaces <i>interface-type</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS 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 routers, the interface type is gr-fpc/pic/port. On J Series routers, the interface type is gr-pim/0/port.</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 798</p> <p>show interfaces brief (GRE) on page 798</p> <p>show interfaces detail (GRE) on page 798</p> <p>show interfaces extensive (GRE) on page 799</p>
Output Fields	Table 142 on page 794 lists the output fields for the show interfaces (GRE) command. Output fields are listed in the approximate order in which they appear.

Table 142: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 142: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface Flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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

Table 142: GRE show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	<p>Information about the logical interface. Possible values listed in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111. 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
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

Table 142: 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
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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 (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
  mp1s

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 798.

show interfaces (IP-over-IP)

Syntax	<pre>show interfaces <i>interface-type</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS 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 routers, the interface type is ip-fpc/pic/port. On J Series routers, the interface type is ip-pim/O/port.</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 802</p> <p>show interfaces brief (IP-over-IP) on page 804</p> <p>show interfaces detail (IP-over-IP) on page 804</p> <p>show interfaces extensive (IP-over-IP) on page 804</p>
Output Fields	Table 143 on page 800 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 143: 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 the "Enabled Field" section under "Common Output Fields Description" on page 111.	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 143: IP-over-IP show interfaces Output Fields (*continued*)

Field	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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
IP Header	IP header of the logical interface.	All levels

Table 143: IP-over-IP show interfaces Output Fields (*continued*)

Field	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 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 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	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-NULL
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 804.

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 OS Release 7.4.
Description	Display status information about the specified logical tunnel interface.
Options	<i>interface-type</i> —On M Series and T Series routers, the interface type is <i>lt-fpc/pic/port</i> . On J Series routers, the interface type is <i>lt-pim/0/port</i> . 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 <i>snmp-index</i> —(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 (Logical Tunnel) on page 809
Output Fields	Table 144 on page 805 lists the output fields for the show interfaces (logical tunnel) command. Output fields are listed in the approximate order in which they appear.

Table 144: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 144: Logical Tunnel show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Type	Type of interface. Software-Pseudo indicates a standard software interface with no associated hardware device.	All levels
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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link type	Type of link.	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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	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

Table 144: 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 OS 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 the "Logical Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels

Table 144: 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 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	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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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 lt-1/0/0 extensive
extensive (Logical   Physical interface: lt-1/0/0, Enabled, Physical link is Up
Tunnel)             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	<code>show interfaces <i>interface-type</i></code> <code><brief | detail | extensive | terse></code> <code><descriptions></code> <code><media></code> <code><snmp-index <i>snmp-index</i>></code> <code><statistics></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display status information about the specified multicast tunnel interface and its logical encapsulation and de-encapsulation interfaces.
Options	<p><i>interface-type</i>—On M Series and T Series routers, the interface type is mt-fpc/pic/port. On J Series routers, the interface type is mt-pim/0/port.</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	The multicast tunnel interface has two logical interfaces: encapsulation and de-encapsulation. These interfaces are automatically created by the Junos OS 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 812
- show interfaces brief (Multicast Tunnel)** on page 812
- show interfaces detail (Multicast Tunnel)** on page 812
- show interfaces extensive (Multicast Tunnel)** on page 812
- show interfaces (Multicast Tunnel Encapsulation)** on page 813
- show interfaces (Multicast Tunnel De-Encapsulation)** on page 813

Output Fields Table 145 on page 811 lists the output fields for the **show interfaces** (Multicast Tunnel) command. Output fields are listed in the approximate order in which they appear.

Table 145: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	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

Table 145: Multicast Tunnel 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. 	All levels
show interfaces (Multicast Tunnel)	<pre> 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) </pre>	
show interfaces brief (Multicast Tunnel)	<pre> 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 </pre>	
show interfaces detail (Multicast Tunnel)	<pre> 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 </pre>	
show interfaces extensive (Multicast Tunnel)	<pre> 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 </pre>	

show interfaces user@host> **show interfaces mt-3/1/0.32768**
(Multicast Tunnel Logical interface mt-3/1/0.32768 (Index 67) (SNMP ifIndex 0)
Encapsulation) 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 user@host> **show interfaces mt-3/1/0.49152**
(Multicast Tunnel Logical interface mt-3/1/0.49152 (Index 74) (SNMP ifIndex 0)
De-Encapsulation) 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	<pre>show interfaces <i>interface-type</i> <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS 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 routers, the PIM de-encapsulation interface type is pd-fpc/pic/port. On J Series routers, it is pd-pim/0/port. On M Series and T Series routers, the PIM encapsulation interface type is pe-fpc/pic/port. On J Series routers, it is pe-pim/0/port.</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 815</p> <p>show interfaces brief (PIM De-Encapsulation) on page 816</p> <p>show interfaces detail (PIM De-Encapsulation) on page 816</p> <p>show interfaces extensive (PIM Encapsulation) on page 816</p> <p>show interfaces (PIM Encapsulation) on page 816</p> <p>show interfaces brief (PIM Encapsulation) on page 816</p> <p>show interfaces detail (PIM Encapsulation) on page 816</p> <p>show interfaces extensive (PIM Encapsulation) on page 817</p>
Output Fields	Table 146 on page 814 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 146: PIM show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical interface	Name of the physical interface.	All levels

Table 146: PIM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	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
(PIMDe-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 Physical interface: pd-0/0/0, Enabled, Physical link is Up
De-Encapsulation)    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 Physical interface: pd-0/0/0, Enabled, Physical link is Up
De-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 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	<pre>show interfaces vt-fpc/pic/port <brief | detail | extensive | terse> <descriptions> <media> <snmp-index snmp-index> <statistics></pre>
Release Information	Command introduced before Junos OS 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><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 (Virtual Loopback Tunnel) on page 820</p> <p>show interfaces brief (Virtual Loopback Tunnel) on page 821</p> <p>show interfaces detail (Virtual Loopback Tunnel) on page 821</p> <p>show interfaces extensive (Virtual Loopback Tunnel) on page 821</p>
Output Fields	Table 147 on page 818 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 147: 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 the "Enabled Field" section under "Common Output Fields Description" on page 111.	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 147: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	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 the "Interface Flags" section under "Common Output Fields Description" on page 111.	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 147: Virtual Loopback Tunnel show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bandwidth	Bandwidth allotted to the logical interface, in kilobytes per second.	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—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
<i>protocol-family</i>	Protocol family configured on the logical interface. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	brief
Protocol	Protocol family configured on the logical interface. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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 the “Family Flags” section under “Common Output Fields Description” on page 111.	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, Maximum labels: 3
    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, Maximum labels: 3, 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, Maximum labels: 3, Generation: 34, Route table:
0
    Flags: None
```

VoIP Interface Operational Mode Commands

Table 148 on page 823 summarizes the command-line interface (CLI) commands that 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 148: VoIP Interface Operational Mode Commands

Task	Command
Remove the Media Gateway Controller (MGC) list configured on the TGM550 module.	clear tgm fpc
Provide a method for user authentication on the TGM550 modules.	request tgm login fpc
Configure the MGC list on the TGM550 module.	set tgm fpc
Display status information about TGM550 modules.	show interfaces (TGM550 Module)
Display dynamic call admission control (CAC) information.	show tgm dynamic-call-admission-control
Display information about TGM550 module connectivity and digital signal processor (DSP) capacity.	show tgm fpc
Display online and offline status of Avaya VoIP Telephony Interface Modules (TIMs).	show tgm telephony-interface-module status

clear tgm fpc

Syntax	<code>clear tgm fpc <i>slot-number</i> media-gateway-controller</code>
Release Information	Command introduced in Junos OS Release 8.2.
Description	(J4350 and J6350 routers 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 Documentation	<ul style="list-style-type: none">• set tgm fpc on page 826• show tgm fpc on page 835
List of Sample Output	clear tgm fpc on page 824
clear tgm fpc	<pre>user@host> clear tgm fpc 2 media-gateway-controller</pre>

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 OS Release 8.5.
Description	(J2320, J2340, J4350, and J6350 J Series routers 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 Documentation	<ul style="list-style-type: none">• show tgm fpc on page 835
List of Sample Output	request tgm login fpc on page 825
request tgm login fpc	<code>user@host> request tgm login fpc 2 user jnpr</code>

set tgm fpc

Syntax	<code>set tgm fpc <i>slot-number</i> media-gateway-controller [<i>ipaddress1 ipaddress2 ipaddress3 ipaddress4</i>]</code>
Release Information	Command introduced in Junos OS Release 8.2.
Description	(J4350 and J6350 routers 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><i>media-gateway-controller</i>—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 Documentation	<ul style="list-style-type: none">• show tgm fpc on page 835
List of Sample Output	set tgm fpc on page 826
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 OS Release 8.2.
Description	(J4350 and J6350 routers 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 831</p> <p>show interfaces brief (TGM550 Module) on page 831</p> <p>show interfaces detail (TGM550 Module) on page 831</p> <p>show interfaces extensive (TGM550 Module) on page 832</p>
Output Fields	Table 149 on page 827 lists the output fields for the show interfaces (TGM550 Module) command. Output fields are listed in the approximate order in which they appear.

Table 149: 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels
Description	Configured interface description.	All levels

Table 149: TGM550 Module 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
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 the "Device Flags" section under "Common Output Fields Description" on page 111.	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 the "Link Flags" section under "Common Output Fields Description" on page 111.	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 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	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 149: 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 OS 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
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. 	extensive

Table 149: TGM550 Module show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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.	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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
<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
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 inet.0 .	detail extensive
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none

Table 149: TGM550 Module show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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
(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
CoS information:
Direction : Output

```

CoS transmit queue		Bandwidth		Buffer	Priority
Limit					
	%	bps	%	usec	
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 OS Release 8.2.
Description	(J4350 and J6350 routers 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 834
Output Fields	Table 150 on page 834 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 150: 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.

```

show tgm      user@host> show tgm dynamic-call-admission-control
dynamic-call  Reported bearer bandwidth limit: 3000 Kbps
-admission-control
                  Interface      State      Activation  Bearer bandwidth
                  priority        priority   limit (Kbps)
                  ge-0/0/3.0      up         200         3000
                  t1-6/0/0.0      up         150         1000

```


show tgm fpc

Syntax	<code>show tgm fpc slot-number (media-gateway-controller | dsp-capacity)</code>
Release Information	Command extended in Junos OS Release 8.5.
Description	(J2320, J2350, J4350, and J6350 J Series routers only) Display information about TGM550 VoIP module connectivity and digital signal processor (DSP) capacity.
Options	<p><i>slot-number</i>—Number of the slot in which the TGM550 VoIP module is installed.</p> <p><i>media-gateway-controller</i>—Display IP addresses of the Media Gateway Controllers (MGCs) configured in the MGC list for the TGM550 VoIP module.</p> <p><i>dsp-capacity</i>—Display the number of voice channels available on the TGM550 VoIP module.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • set tgm fpc on page 826
List of Sample Output	<p>show tgm fpc 2 media-gateway-controller on page 835</p> <p>show tgm fpc 3 dsp-capacity on page 835</p>
Output Fields	Table 151 on page 835 lists the output fields for the show tgm fpc command. Output fields are listed in the approximate order in which they appear.

Table 151: show tgm fpc Output Fields

Field Name	Field Description
Media gateway controller(s)	<p>Displays the IP addresses of the Media Gateway Controllers (MGCs) configured in the MGC list for the TGM550 VoIP module.</p> <p>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.</p>
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	<pre>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</pre>
show tgm fpc 3 dsp-capacity	<pre>root> Show tgm fpc 3 dsp-capacity DSP Capacity:20 voice channels.</pre>

show tgm telephony-interface-module status

Syntax	show tgm telephony-interface-module status
Release Information	Command extended in Junos OS Release 8.5.
Description	(J2320, J2350, J4350, and J6350 routers 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 836
Output Fields	Table 152 on page 836 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 152: 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          user@host> show tgm telephony-interface-module status
telephony-interface-module
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 839
- Loopback Interface Operational Mode Commands on page 845
- Management Ethernet and Internal Ethernet Interface Operational Mode Commands on page 853

Discard Interface Operational Mode Commands

Table 153 on page 839 summarizes the command-line interface (CLI) command that you can use to monitor and troubleshoot the discard (**dsc**) interface.

Table 153: 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	<pre>show interfaces dsc <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS 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—(Optional) This option is not relevant for the discard interface and always shows a value of 0.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show interfaces (ATM) on page 496 • show interfaces routing on page 86
List of Sample Output	<p>show interfaces dsc on page 843</p> <p>show interfaces dsc brief on page 843</p> <p>show interfaces dsc detail on page 843</p> <p>show interfaces dsc extensive on page 844</p>
Output Fields	Table 154 on page 840 lists the output fields for the show interfaces (discard) command. Output fields are listed in the approximate order in which they appear.

Table 154: 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 154: 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 the "Device Flags" section under "Common Output Fields Description" on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	All levels
Link type	Encapsulation being used on the physical interface.	detail extensive
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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

Table 154: Discard 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	<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 OS 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

Table 154: Discard show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels
Protocol	Protocol family configured on the logical interface, such as iso , inet6 , or mpls .	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
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 user@host> show interfaces dsc brief
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 user@host> show interfaces dsc detail
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 extensive user@host> show interfaces dsc 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

```

Loopback Interface Operational Mode Commands

Table 155 on page 845 summarizes the command-line interface (CLI) command that you can use to monitor and troubleshoot the local loopback interface (lo0).

Table 155: Loopback Interface Operational Mode Command

Task	Command
Monitor the loopback interface.	show interfaces (Loopback)

The Junos OS 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 OS 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 849
 `show interfaces brief (Loopback)` on page 850
 `show interfaces detail (Loopback)` on page 850
 `show interfaces extensive (Loopback)` on page 851

Output Fields Table 156 on page 846 lists the output fields for the **show interfaces (loopback)** command. Output fields are listed in the approximate order in which they appear.

Table 156: Loopback show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical Interface	Name of the physical interface.	All levels

Table 156: Loopback show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link type	Data transmission type.	detail extensive
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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: 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

Table 156: 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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	brief detail extensive
Encapsulation	Encapsulation on the logical interface.	brief detail extensive
Input packets	Number of packets received on the logical interface.	None specified

Table 156: Loopback show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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, 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 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

Management Ethernet and Internal Ethernet Interface Operational Mode Commands

Table 157 on page 853 summarizes the command-line interface (CLI) commands that you can use to monitor and troubleshoot the management Ethernet interface and, in the case of M Series and T Series routers, the internal Ethernet interface.

Table 157: Management Ethernet and Internal Ethernet Interface Operational Mode Commands

Task	Command
Monitor the M Series and T Series router management Ethernet and internal Ethernet interfaces.	show interfaces (M Series and T Series Router Management and Internal Ethernet)
Monitor the J Series router management Ethernet interface.	show interfaces (J Series Router Management Ethernet)

On the M Series and T Series routers other than the TX Matrix Plus router and T1600 routers in a routing matrix, the Junos OS automatically creates the router'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 TX Matrix Plus Routers and T1600 routers configured in a routing matrix, the Junos OS automatically creates the router's management Ethernet interface, **em0**. To use **em0** as a management port, you must configure its logical port, **em0.0**, with a valid IP address.

On a TX Matrix Plus router, the Routing Engine (RE-TXP-SFC) and Control Board (TXP-CB) function as a unit, or host subsystem. For each host subsystem in the router, the Junos OS automatically creates two internal Ethernet interfaces, **ixgbe0** and **ixgbe1**, for the two 10-Gigabit Ethernet ports on the Routing Engine.

For more information about the management Ethernet interface and internal Ethernet interfaces on a TX Matrix Plus router and T1600 routers configured in a routing matrix, see the *Junos Network Interfaces Configuration Guide*.

On J Series routers, the Junos OS automatically creates the router'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 Router Management and Internal Ethernet)

Syntax	<pre>show interfaces fxp(0 | 1) <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Syntax (TX Matrix Router)	<pre>show interfaces em0 <brief | detail | extensive | terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M Series and T Series routers only) Display status information about the management Ethernet and internal Ethernet interfaces.
Options	<p>fxp(0 | 1)—(M Series and T Series routers other than a TX Matrix Plus router or T1600 routers in a routing matrix) Display standard information about the management Ethernet or internal Ethernet interface, respectively.</p> <p>em0—(TX Matrix Plus routers and T1600 routers in a routing matrix) Display standard information about the management 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	<pre>show interfaces brief (Management Ethernet) on page 859 show interfaces (Management Ethernet) on page 859 show interfaces (Management Ethernet [TX Matrix Plus Router]) on page 860 show interfaces detail (Management Ethernet) on page 860 show interfaces detail (Management Ethernet [TX Matrix Plus Router]) on page 861 show interfaces extensive (Management Ethernet) on page 861 show interfaces extensive (Management Ethernet [TX Matrix Plus Router]) on page 862 show interfaces brief (Management Ethernet) on page 863 show interfaces brief (Management Ethernet [TX Matrix Plus Router]) on page 863 show interfaces (Internal Ethernet) on page 863</pre>

show interfaces (Internal Ethernet [TX Matrix Plus Router]) on page 864
show interfaces detail (Internal Ethernet) on page 864
show interfaces detail (Internal Ethernet [TX Matrix Plus Router]) on page 865
show interfaces extensive (internal Ethernet) on page 866
show interfaces extensive (internal Ethernet [TX Matrix Plus Router]) on page 867

Output Fields Table 158 on page 857 lists the output fields for the **show interfaces** (management) command on the M Series and T Series routers. Output fields are listed in the approximate order in which they appear.

Table 158: M Series and T Series Router 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	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 the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under “Common Output Fields Description” on page 111.	All levels
Link type	Data transmission type.	detail extensive none
Link flags	Information about the link. Possible values are described in the “Link Flags” section under “Common Output Fields Description” on page 111.	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 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

Table 158: M Series and T Series Router Management and Internal Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Input packets	Number of packets received on the physical interface.	None specified
Output packets	Number of packets transmitted on the physical interface.	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 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

Table 158: M Series and T Series Router Management and Internal Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Flags	Information about the logical interface; values are described in the “Device Flags” section under “Common Output Fields Description” on page 111.	All levels
Encapsulation	Encapsulation on the logical interface.	detail extensive none
inet	IP address of the logical interface.	brief
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 the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive none
Addresses, Flags	Information about address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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      user@host> show interfaces fxp0 brief
(Management Ethernet)    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          user@host> show interfaces fxp0
(Management Ethernet)    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
(Management
Ethernet [TX Matrix
Plus Router])

```

user@host> show interfaces em0
Physical interface: em0, Enabled, Physical link is Up
  Interface index: 8, SNMP ifIndex: 17
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Current address: 00:80:f9:26:00:c0, Hardware address: 00:80:f9:26:00:c0
  Last flapped   : Never
    Input packets : 1424
    Output packets: 5282

```

```

Logical interface em0.0 (Index 3) (SNMP ifIndex 18)
  Flags: SNMP-Traps Encapsulation: ENET2
  Input packets : 1424
  Output packets: 5282
  Protocol inet, MTU: 1500
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 192.168.178.0/25, Local: 192.168.178.11, Broadcast:
192.168.178.127

```

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 detail
(Management
Ethernet [TX Matrix
Plus Router])**

```
user@host> show interfaces em0 detail
Physical interface: em0, Enabled, Physical link is Up
  Interface index: 8, SNMP ifIndex: 17, Generation: 2
  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:  00:80:f9:26:00:c0, Hardware address: 00:80:f9:26:00:c0
  Alternate link address: Unspecified
  Last flapped     : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes  :           124351
    Output bytes :          1353212
    Input packets:           1804
    Output packets:          5344
  IPv6 transit statistics:
    Input bytes  :             0
    Output bytes :             0
    Input packets:             0
    Output packets:            0

Logical interface em0.0 (Index 3) (SNMP ifIndex 18) (Generation 1)
  Flags: SNMP-Traps Encapsulation: ENET2
  Traffic statistics:
    Input bytes  :           117135
    Output bytes :          1331647
    Input packets:           1804
    Output packets:          5344
  Local statistics:
    Input bytes  :           117135
    Output bytes :          1331647
    Input packets:           1804
    Output packets:          5344
  Protocol inet, MTU: 1500, Generation: 1, Route table: 0
  Flags: Is-Primary
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.178.0/25, Local: 192.168.178.11, Broadcast:
    192.168.178.127, 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
extensive
(Management
Ethernet [TX Matrix
Plus Router])**

```

user@host> show interfaces em0 extensive

Physical interface: em0, Enabled, Physical link is Up
  Interface index: 8, SNMP ifIndex: 17, Generation: 2
  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: 00:80:f9:26:00:c0, Hardware address: 00:80:f9:26:00:c0
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :          127120
    Output bytes :         1357414
    Input packets:           1843
    Output packets:          5372
  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 em0.0 (Index 3) (SNMP ifIndex 18) (Generation 1)
Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
  Input bytes :          119748
  Output bytes :         1335719
  Input packets:           1843
  Output packets:          5372
Local statistics:
  Input bytes :          119748
  Output bytes :         1335719

```

```

      Input packets:          1843
      Output packets:         5372
      Protocol inet, MTU: 1500, Generation: 1, Route table: 0
      Flags: Is-Primary
      Addresses, Flags: Is-Preferred Is-Primary
      Destination: 192.168.178.0/25, Local: 192.168.178.11, Broadcast:
192.168.178.127, Generation: 1

```

**show interfaces brief
(Management
Ethernet)**

```

user@host> show interfaces fxp1 brief
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 brief
(Management
Ethernet [TX Matrix
Plus Router])**

```

user@host> show interfaces em0 brief
Physical interface: em0, 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 em0.0
  Flags: SNMP-Traps Encapsulation: ENET2
  inet 192.168.178.11/25

```

**show interfaces
(Internal Ethernet)**

```

user@host> show interfaces fxp1
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
(Internal Ethernet [TX
Matrix Plus Router])

```
user@host> show interfaces ixgbe0
Physical interface: ixgbe0, Enabled, Physical link is Up
  Interface index: 2, SNMP ifIndex: 116
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Current address: 02:00:00:22:00:04, Hardware address: 02:00:00:22:00:04
  Last flapped   : Never
    Input packets : 2301738
    Output packets: 3951155
```

```
Logical interface ixgbe0.0 (Index 4) (SNMP ifIndex 117)
  Flags: SNMP-Traps Encapsulation: ENET2
  Input packets : 2301595
  Output packets: 3951155
  Protocol inet, MTU: 1500
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred
      Destination: 10/8, Local: 10.34.0.4, Broadcast: 10.255.255.255
    Addresses, Flags: Primary Is-Default Is-Preferred Is-Primary
      Destination: 128/2, Local: 162.0.0.4, Broadcast: 191.255.255.255
  Protocol inet6, MTU: 1500
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred
      Destination: fe80::/64, Local: fe80::200:ff:fe22:4
    Addresses, Flags: Is-Default Is-Preferred Is-Primary
      Destination: fec0::/64, Local: fec0::a:22:0:4
  Protocol tnp, MTU: 1500
    Flags: Primary, Is-Primary
    Addresses
      Local: 0x22000004
```

show interfaces detail
(Internal Ethernet)

```
user@host> show interfaces fxp1 detail
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 detail
(Internal Ethernet [TX
Matrix Plus Router])

```

user@host> show interfaces ixgbe0 detail
Physical interface: ixgbe0, Enabled, Physical link is Up
  Interface index: 2, SNMP ifIndex: 116, Generation: 3
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 1000Mbps
  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: 02:00:00:22:00:04, Hardware address: 02:00:00:22:00:04
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :          238172825
    Output bytes:          1338948955
    Input packets:          2360984
    Output packets:          4061512
  IPv6 transit statistics:
    Input bytes :              0
    Output bytes :              0
    Input packets:              0
    Output packets:              0

Logical interface ixgbe0.0 (Index 4) (SNMP ifIndex 117) (Generation 2)
  Flags: SNMP-Traps Encapsulation: ENET2
  Traffic statistics:
    Input bytes :          228720309
    Output bytes :          1261387447
    Input packets:          2360841
    Output packets:          4061512
  IPv6 transit statistics:
    Input bytes :              0
    Output bytes :              0
    Input packets:              0
    Output packets:              0
  Local statistics:
    Input bytes :          228720309
    Output bytes :          1261387447
    Input packets:          2360841
    Output packets:          4061512
  Protocol inet, MTU: 1500, Generation: 2, Route table: 1
  Flags: Is-Primary
  Addresses, Flags: Is-Preferred

```

```

    Destination: 10/8, Local: 10.34.0.4, Broadcast: 10.255.255.255, Generation:
2
    Addresses, Flags: Primary Is-Default Is-Preferred Is-Primary
    Destination: 128/2, Local: 162.0.0.4, Broadcast: 191.255.255.255,
Generation: 3
    Protocol inet6, MTU: 1500, Generation: 3, Route table: 1
    Flags: Is-Primary
    Addresses, Flags: Is-Preferred
    Destination: fe80::/64, Local: fe80::200:ff:fe22:4
    Generation: 4
    Addresses, Flags: Is-Default Is-Preferred Is-Primary
    Destination: fec0::/64, Local: fec0::a:22:0:4
    Protocol tnp, MTU: 1500, Generation: 5
    Generation: 4, Route table: 1
    Flags: Primary, Is-Primary
    Addresses, Flags: None
    Destination: Unspecified, Local: 0x22000004, Broadcast: Unspecified,
Generation: 6

```

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, 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 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 [TX
Matrix Plus Router])
user@host> show interfaces ixgbe0 extensive
Physical interface: ixgbe0, Enabled, Physical link is Up
Interface index: 2, SNMP ifIndex: 116, Generation: 3
Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
Speed: 1000mbps
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: 02:00:00:22:00:04, Hardware address: 02:00:00:22:00:04
Alternate link address: Unspecified
Last flapped : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes : 242730780
Output bytes : 1348312269
Input packets: 2398737
Output packets: 4133510
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 ixgbe0.0 (Index 4) (SNMP ifIndex 117) (Generation 2)
Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
Input bytes : 233127252
Output bytes : 1269350897
Input packets: 2398594
Output packets: 4133510
IPv6 transit statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 233127252
Output bytes : 1269350897
Input packets: 2398594
Output packets: 4133510
Protocol inet, MTU: 1500, Generation: 2, Route table: 1
Flags: Is-Primary
Addresses, Flags: Is-Preferred
Destination: 10/8, Local: 10.34.0.4, Broadcast: 10.255.255.255, Generation:
2
Addresses, Flags: Primary Is-Default Is-Preferred Is-Primary
Destination: 128/2, Local: 162.0.0.4, Broadcast: 191.255.255.255,
Generation: 3

```

```
Protocol inet6, MTU: 1500, Generation: 3, Route table: 1
  Flags: Is-Primary
  Addresses, Flags: Is-Preferred
    Destination: fe80::/64, Local: fe80::200:ff:fe22:4
  Generation: 4
  Addresses, Flags: Is-Default Is-Preferred Is-Primary
    Destination: fec0::/64, Local: fec0::a:22:0:4
Protocol tnp, MTU: 1500, Generation: 5
  Generation: 4, Route table: 1
  Flags: Primary, Is-Primary
  Addresses, Flags: None
    Destination: Unspecified, Local: 0x22000004, Broadcast: Unspecified,
  Generation: 6
```

show interfaces (J Series Router 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 OS Release 7.4.
Description	(J Series routers 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 876</p> <p>show interfaces (Management Ethernet) on page 876</p> <p>show interfaces detail (Management Ethernet) on page 877</p> <p>show interfaces extensive (Management Ethernet) on page 877</p>
Output Fields	Table 159 on page 869 lists the output fields for the show interfaces (management) command on the J Series routers. Output fields are listed in the approximate order in which they appear.

Table 159: J Series Router 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 the “Enabled Field” section under “Common Output Fields Description” on page 111.	All levels

Table 159: J Series Router Management Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Interface index	Physical interface index number, which reflects its initialization sequence.	detail extensive
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 local or remote).	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 the "Device Flags" section under "Common Output Fields Description" on page 111.	brief detail extensive
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under "Common Output Fields Description" on page 111.	brief detail extensive
Link flags	Information about the link. Possible values are described in the "Link Flags" section under "Common Output Fields Description" on page 111.	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 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

Table 159: J Series Router Management Ethernet 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. • 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

Table 159: J Series Router Management Ethernet 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. • 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
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

Table 159: J Series Router Management Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 159: J Series Router 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
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

Table 159: J Series Router Management Ethernet 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. 	extensive
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—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: 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 the “Logical Interface Flags” section under “Common Output Fields Description” on page 111.	brief detail extensive
Encapsulation	Encapsulation on the logical interface.	brief detail extensive
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, 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 iso or inet6).	All levels

Table 159: J Series Router Management Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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, Route table:0 refers to inet.0.	All levels
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under “Common Output Fields Description” on page 111.	detail extensive
Addresses, Flags	Information about address flags. Possible values are described in the “Addresses Flags” section under “Common Output Fields Description” on page 111.	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      Physical interface: fe-0/0/0, Enabled, Physical link is Up
  Ethernet)         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      Physical interface: fe-0/0/0, Enabled, Physical link is Up
  Ethernet)         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:
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              0
Jabber frames          0                0
Fragment frames        0                0
VLAN tagged frames     0                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 information:

```

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

Destination: 192.168.64/21, Local: 192.168.69.55,

Broadcast: 192.168.71.255, Generation: 7

PART 13

Index

- Index on page 883
- Index of Statements and Commands on page 893

Index

Symbols

!	
in interface names.....	5
#, comments in configuration statements.....	xx
(), in syntax descriptions.....	xx
*	
in interface names.....	5
10-Gigabit Ethernet interfaces	
DWDM	
data and alarms, displaying.....	222
status information, displaying.....	212, 214
< >, in syntax descriptions.....	xx
[]	
in interface names.....	5
[], in configuration statements.....	xx
{ }, in configuration statements.....	xx
| (pipe), in syntax descriptions.....	xx

A

adaptive services.....	703
adaptive services interfaces.....	705
status information, displaying.....	705
Addresses, flags field, content.....	112
ADSL	
ATM-over-ADSL interfaces	
status information, displaying.....	529
aenumber interface.....	11, 13
described.....	11, 13
<i>See also</i> aggregated Ethernet interfaces	
aggregated Ethernet interfaces	
status information, displaying.....	139
aggregated Ethernet interfaces with link protection	
manually switching to the backup link.....	137
reverting to the primary link.....	137
aggregated Ethernet LACP link protection	
manually switching.....	138
aggregated SONET/SDH interfaces	
status information, displaying.....	448
APS	
real-time information, displaying.....	444

asnumber interface.....	11
described.....	11
<i>See also</i> aggregated SONET/SDH interfaces	
asymmetric digital subscriber line <i>See</i> ADSL	
Asynchronous Transfer Mode <i>See</i> ATM	
at- interface.....	11, 14
described.....	11, 14
<i>See also</i> ATM interfaces	
<i>See also</i> ATM-over-ADSL interfaces	
<i>See also</i> ATM-over-SHDSL interfaces	
ATM interfaces	
status information, displaying.....	496
ATM-over-ADSL interfaces	
status information, displaying.....	529
ATM-over-SHDSL interfaces	
status information, displaying.....	537
Automatic Protection Switching <i>See</i> APS	

B

B-channel interface <i>See</i> ISDN	
Basic Rate Interface <i>See</i> ISDN	
bc- interface.....	14
described.....	14
<i>See also</i> ISDN	
br- interface.....	14
described.....	14
<i>See also</i> ISDN	
braces, in configuration statements.....	xx
brackets	
angle, in syntax descriptions.....	xx
square, in configuration statements.....	xx

C

cau4- interface.....	11
described.....	11
<i>See also</i> channelized OC12 IQ or IQE and channelized STM1 IQ interfaces	
ce1- interface.....	11
described.....	11
<i>See also</i> channelized E1 IQ interfaces	

CFM statistics	
clearing.....	131
displaying for CFM interfaces.....	269
displaying for interfaces.....	262
channelized AU-4 IQ interfaces <i>See</i> channelized STM1 IQ interfaces and channelized OC12 IQ or IQE interfaces	
channelized DS3-to-DS0 interfaces	
status information, displaying.....	671
channelized DS3-to-DS1 interfaces	
status information, displaying.....	682
channelized E1 interfaces	
status information, displaying.....	600
channelized E1 IQ interfaces	
controller information, displaying.....	615
status information, displaying.....	611
channelized OC12 interfaces	
status information, displaying.....	637
channelized OC12 IQ interfaces	
controller information, displaying.....	646
status information, displaying.....	641
channelized OC12 IQE interfaces	
controller information, displaying.....	646
status information, displaying.....	641
channelized OC3 IQ interfaces	
controller information, displaying.....	645
status information, displaying.....	618
channelized OC3 IQE interfaces	
controller information, displaying.....	645
status information, displaying.....	618
channelized STM1 interfaces	
status information, displaying.....	650
channelized STM1 IQ interfaces	
controller information, displaying.....	668
status information, displaying.....	665
channelized T1 IQ interfaces	
controller information, displaying.....	699
status information, displaying.....	685
channelized T3 IQ interfaces	
controller information, displaying.....	700
status information, displaying.....	697
clear auto-configuration interfaces command.....	125
clear ilmi statistics command.....	546
clear interfaces interface-set statistics	
command.....	28, 128
clear interfaces interval command.....	25
clear interfaces mac-database command.....	126
clear interfaces mac-database statistics	
command.....	127
clear interfaces statistics command.....	27
clear isdn q921 statistics command.....	555
clear isdn q931 statistics command.....	556
clear oam ethernet connectivity-fault-management linktrace path-database command.....	129
clear oam ethernet connectivity-fault-management policer command.....	130
clear oam ethernet connectivity-fault-management statistics.....	131
clear oam ethernet link-fault-management state command.....	132
clear oam ethernet link-fault-management statistics command.....	133
clear ppp statistics command.....	378
clear pppoe sessions command.....	399
clear pppoe statistics command.....	400
clear protection-group ethernet-ring statistics	
command.....	134
clear tgm fpc command.....	824
clear vrrp command.....	314
coc1- interface.....	11
described.....	11
<i>See also</i> channelized OC3 IQ and IQE interfaces	
coc12- interface.....	11
described.....	11
<i>See also</i> channelized OC12 IQ or IQE interfaces	
coc3- interface.....	11
described.....	11
<i>See also</i> channelized OC3 IQ interfaces	
comments, in configuration statements.....	xx
connectivity-fault-management	
linktrace database, clearing.....	129
container interfaces.....	22
conventions	
text and syntax.....	xix
CoS	
byte count by PIC type	
displaying.....	57
cp- interface.....	21
described.....	21
<i>See also</i> flow collector interfaces	
cstm1- interface.....	11
described.....	11
<i>See also</i> channelized STM1 IQ interfaces	
cstm4- interface.....	11
described.....	11
<i>See also</i> channelized OC12 IQ or IQE interfaces	
CSU alarm	
clearing.....	25

ct1- interface.....	11
described.....	11
<i>See also</i> channelized T3 IQ interfaces	
ct3- interface.....	11
described.....	11
<i>See also</i> channelized T3 IQ interfaces	
curly braces, in configuration statements.....	xx
customer support.....	xxi
contacting JTAC.....	xxi

D

D-channel interface <i>See</i> ISDN	
dc- interface.....	14
described.....	14
<i>See also</i> ISDN	
destination class	
interface information	
displaying.....	33
Destination class field, contents.....	111
Device flags field, content.....	112
dfc- interface.....	21
described.....	21
<i>See also</i> dynamic flow capture interfaces	
dialer interface <i>See</i> ISDN	
discard interface	
described.....	7
status information, displaying.....	840
dlnumber interface.....	14
described.....	14
<i>See also</i> ISDN	
documentation	
comments on.....	xxi
ds- interface.....	12
<i>See also</i> channelized E1 IQ interfaces	
<i>See also</i> channelized DS3-to-DS0 interfaces	
<i>See also</i> channelized E1 interfaces	
<i>See also</i> channelized E1 IQ interfaces	
dsc interface.....	7
described.....	7
<i>See also</i> discard interface	
DWDM 10-Gigabit Ethernet interfaces	
data and alarms, displaying.....	222
dynamic flow capture interfaces	
displaying.....	726
dynamic vlan interfaces, clearing.....	125

E

E1 interfaces	
status information, displaying.....	328

e1- interface.....	12
described.....	12
<i>See also</i> channelized E1 IQ interfaces	
E3 interfaces	
status information, displaying.....	347
e3- interface.....	12
described.....	12
<i>See also</i> E3 interfaces	
Enabled field, contents.....	111
encryption interfaces	
status information, displaying.....	718
es- interface.....	21
described.....	21
<i>See also</i> encryption interfaces	
ETH-DM frame counts (with CFM statistics)	
displaying for MEPS by enclosing CFM.....	269
displaying for MEPS by interface or domain	
level.....	262
ETH-DM statistics (only)	
displaying.....	255
ETH-DM statistics and frame counts	
clearing.....	131
displaying.....	276
Ethernet interface set	
status information, displaying.....	212
Ethernet interface set queue	
status information, displaying.....	214
Ethernet interfaces	
CFM statistics	
clearing.....	131
displaying for CFM interfaces.....	269
displaying for interfaces.....	262
connectivity-fault-management.....	129
ETH-DM frame counts (with CFM statistics)	
displaying for MEPS by enclosing	
CFM.....	269
displaying for MEPS by interface or domain	
level.....	262
ETH-DM statistics (only)	
displaying.....	255
ETH-DM statistics and frame counts	
clearing.....	131
displaying.....	276
OAM state, clearing.....	132
OAM statistics, clearing.....	133
protection group statistics, clearing.....	134
status information, displaying	
aggregated.....	139
Fast Ethernet.....	151

Gigabit Ethernet.....	168, 189
internal.....	855
management.....	855, 869
ethernet ring	
protection group APS.....	298
protection group data channel.....	300, 308
protection group interface.....	302
protection group node state.....	304
protection group statistics.....	306

F

Family flags field, content.....	113
Fast Ethernet interfaces	
status information, displaying.....	151
fe- interface.....	12, 13
described.....	12, 13
<i>See also</i> Fast Ethernet interfaces	
Filters fields, contents.....	112
firewall filters	
displaying.....	46
flags	
address flags.....	112
device flags.....	112
family flags.....	113
interface flags.....	114
link flags.....	114
logical interface flags.....	115
flow collector interfaces	
status information, displaying.....	730
flow monitoring interfaces	
status information, displaying.....	736
font conventions.....	xix
fxp interface.....	8
described.....	8
<i>See also</i> Ethernet interfaces	

G

G.SHDSL <i>See</i> SHDSL	
ge- interface.....	12, 13
described.....	12, 13
<i>See also</i> Gigabit Ethernet interfaces	
ge-0/0/0 interface.....	9
described.....	9
<i>See also</i> Ethernet interfaces	
generic routing encapsulation <i>See</i> GRE	
Gigabit Ethernet interfaces	
demultiplexing interface information,	
displaying.....	368
diagnostics information, displaying.....	222

LACP, displaying.....	246
MAC database, displaying.....	250
status information,	
displaying.....	168, 189, 212, 214
Gigabit Ethernet IQ PIC	
traffic and MAC statistics.....	189
gre interface	
described.....	10
GRE interfaces	
status information, displaying.....	794

I

icons defined, notice.....	xix
ILMI	
statistics	
clearing.....	546
displaying.....	548
status, displaying.....	547
Integrated Local Management Interface <i>See</i> ILMI	
integrated routing and bridging interfaces	
integrated routing and bridging interfaces,	
displaying.....	240
Integrated Services Digital Network <i>See</i> ISDN	
interface descriptions	
displaying.....	31
Interface flags field, content.....	114
interface names	
conventions.....	3
loopback interfaces.....	7
nonconfigurable interfaces.....	9
routing interfaces.....	10
services interfaces.....	20
wildcard characters in.....	5
interfaces	
container interfaces.....	22
internal Ethernet interface	
described.....	8
status information, displaying.....	855
ip- interface.....	20
described.....	20
<i>See also</i> IP-over-IP interfaces	
IP-over-IP interfaces	
status information, displaying.....	800
ipip interface.....	10
described.....	10
<i>See also</i> nonconfigurable interfaces	
ISDN	
B-channel interfaces, displaying.....	563
BRI interfaces, displaying.....	569

- calls, displaying.....588
 - D-channel interfaces, displaying.....573
 - default software values, displaying.....557
 - dialer interfaces, displaying.....559, 579
 - dialer pools, displaying.....561
 - history, displaying.....589
 - q921 statistics
 - clearing.....555
 - displaying.....590
 - q931 statistics
 - clearing.....556
 - displaying.....592
 - status, displaying.....595
- J**
- J Series router physical interfaces.....14
 - J Series services interfaces.....22
- L**
- label-switched interface *See* LSI
 - Label-switched interface (LSI) traffic statistics field,
 - content.....115
 - LACP
 - displaying.....246
 - Link flags field, content.....114
 - link services interfaces
 - status information, displaying.....742
 - link services IQ interfaces
 - status information, displaying.....755
 - link-protected aggregated Ethernet interfaces
 - manually switching to the backup link.....137
 - reverting to the primary link.....137
 - link-protected aggregated Ethernet LACP links
 - manually switching.....138
 - linktrace
 - database, displaying.....281
 - tracing.....310
 - lo0 interface.....7
 - described.....7
 - See also* loopback interface
 - Logical interface flags field.....115
 - logical interfaces
 - assigned to a logical system.....15
 - unit numbers.....4
 - logical systems
 - show interfaces command output.....16
 - logical tunnel interfaces
 - status information, displaying.....805
 - loopback interface
 - status information, displaying.....846
 - loopback protocol
 - ping ethernet command.....135
 - ls- interface.....20, 21
 - described.....20, 21
 - See also* link services interfaces
 - LSI
 - traffic statistics.....115
 - lsi interface.....10
 - described.....10
 - See also* nonconfigurable interfaces
 - lsq- interface.....21
 - described.....21
 - See also* link services IQ interfaces
 - lt- interface.....21
 - described.....21
 - See also* logical tunnel interfaces
- M**
- M Series physical interfaces.....10
 - M Series services interfaces.....20
 - MAC database, displaying.....250
 - management interface *See* Ethernet interfaces
 - manuals
 - comments on.....xxi
 - Media Gateway Controller *See* MGC
 - media-specific interface information
 - displaying.....50
 - MGC
 - list, clearing on the TGM550 module.....824
 - list, configuring on the TGM550
 - module.....825, 826
 - ml- interface.....21
 - described.....21
 - See also* multilink interfaces
 - mo- interface.....21
 - described.....21
 - See also* flow monitoring interfaces
 - mt- interface.....21
 - described.....21
 - See also* multicast tunnel interfaces
 - mtun interface.....10
 - described.....10
 - See also* nonconfigurable interfaces
 - multi-chassis link aggregation interface
 - displaying.....254
 - multicast tunnel interfaces
 - status information, displaying.....810

multilink interfaces	
status information, displaying.....	771
Multiplex Section Protection <i>See</i> MSP	
MX Series router physical interfaces.....	13

N

nonconfigurable interfaces.....	9
notice icons defined.....	xix

O

OAM state	
clearing.....	132
OAM statistics	
clearing.....	133
oc3- interface.....	12
described.....	12
<i>See also</i> channelized OC3 IQ and IQE interfaces	

P

parentheses, in syntax descriptions.....	xx
pd- interface.....	21
described.....	21
<i>See also</i> PIM de-encapsulation interfaces	
pe- interface.....	21
described.....	21
<i>See also</i> PIM encapsulation interfaces	
PIM de-encapsulation interfaces	
status information, displaying.....	814
PIM encapsulation interfaces	
status information, displaying.....	814
pimd interface.....	10
described.....	10
<i>See also</i> nonconfigurable interfaces	
pime interface.....	10
described.....	10
<i>See also</i> nonconfigurable interfaces	
ping ethernet command.....	135
Policer field, content.....	116
policers, interface information	
displaying.....	52
pp0- interface.....	12, 14
described.....	12, 14
<i>See also</i> PPPoE	
PPP	
address pools, displaying.....	379
interfaces, displaying.....	381
statistics	
clearing.....	378
displaying.....	389

PPPoE

interfaces, displaying.....	401, 411
service name tables, displaying.....	415
service name tables, displaying active	
sessions.....	417
statistics	
clearing.....	400
displaying.....	419
underlying interfaces, displaying.....	421
version, displaying.....	424
protection group	
ethernet ring APS.....	298
ethernet ring interface.....	302
ethernet ring node state.....	304
ethernet ring statistics.....	306
ethernet ring VLANs.....	300, 308
protection group statistics	
clearing.....	134
Protocol field, content.....	116

R

real-time monitoring	
APS groups and interfaces.....	444
redundant adaptive services interfaces	
reverting to the primary interface.....	704
status information, displaying.....	713
switching to the secondary interface.....	704
redundant link services IQ interfaces	
status information, displaying.....	779
request interface (revert | switchover) (Adaptive	
Services) command.....	704
request interface (revert | switchover) (Aggregated	
Ethernet Link Protection) command.....	137
request lacp link-switchover command.....	138
request tgm login fpc command.....	825
rlsq- interface.....	22
described.....	22
<i>See also</i> redundant link services IQ interfaces	
routing information	
interfaces	
state, displaying.....	86
summary, displaying.....	92
routing interfaces	
types, defined.....	10
RPF Failures field, content.....	117
rsp- interface.....	21
described.....	21
<i>See also</i> redundant adaptive services interfaces	

S

- se- interface.....12
 - described.....12
 - See also serial interfaces
- serial interfaces
 - status information, displaying.....428
- services interfaces
 - types, described.....20
- set tgm fpc command.....826
- SHDSL
 - ATM-over-SHDSL interfaces
 - status information, displaying.....537
 - show aps command.....444
 - show dialer defaults command.....557
 - show dialer interfaces command.....559
 - show dialer pools command.....561
 - show ilmi command.....547
 - show ilmi statistics command.....548
 - show interfaces
 - logical system context.....16
 - show interfaces (10-Gigabit Ethernet)
 - command.....189
 - show interfaces (Adaptive Services)
 - command.....705
 - show interfaces (Aggregated Ethernet)
 - command.....139
 - show interfaces (Aggregated SONET/SDH)
 - command.....448
 - show interfaces (ATM) command.....496
 - show interfaces (ATM-over-ADSL)
 - command.....529
 - show interfaces (ATM-over-SHDSL)
 - command.....537
 - show interfaces (Channelized DS3-to-DS0)
 - command.....671
 - show interfaces (Channelized DS3-to-DS1)
 - command.....682
 - show interfaces (Channelized E1 IQ)
 - command.....611
 - show interfaces (Channelized E1) command.....600
 - show interfaces (Channelized OC12 IQ)
 - command.....641
 - show interfaces (Channelized OC12)
 - command.....637
 - show interfaces (Channelized OC3 IQ and IQE)
 - command.....618
 - show interfaces (Channelized STM1 IQ)
 - command.....665
 - show interfaces (Channelized STM1)
 - command.....650
 - show interfaces (Channelized T1 IQ)
 - command.....685
 - show interfaces (Channelized T3 IQ)
 - command.....697
 - show interfaces (discard) command.....840
 - show interfaces (Dynamic Flow Capture)
 - command.....726
 - show interfaces (Encryption) command.....718
 - show interfaces (Fast Ethernet) command.....151
 - show interfaces (Flow Collector) command.....730
 - show interfaces (Flow Monitoring) command.....736
 - show interfaces (Gigabit Ethernet) command.....168
 - show interfaces (GRE) command.....794
 - show interfaces (IP-over-IP) command.....800
 - show interfaces (ISDN B-channel) command.....563
 - show interfaces (ISDN BRI) command.....569
 - show interfaces (ISDN D-channel) command.....573
 - show interfaces (ISDN dialer) command.....579
 - show interfaces (J Series Management Ethernet)
 - command.....869
 - show interfaces (Link Services IQ) command.....755
 - show interfaces (Link Services) command.....742
 - show interfaces (Logical Tunnel) command.....805
 - show interfaces (Loopback) command.....846
 - show interfaces (M Series and T Series Management and Internal Ethernet)
 - command.....855
 - show interfaces (Multicast Tunnel)
 - command.....810
 - show interfaces (Multilink Services) command.....771
 - show interfaces (PIM) command.....814
 - show interfaces (PPPoE) command.....401
 - show interfaces (Redundant Adaptive Services)
 - command.....713
 - show interfaces (Redundant Link Services IQ)
 - command.....779
 - show interfaces (Serial) command.....428
 - show interfaces (SONET/SDH) command.....455
 - show interfaces (T1 or E1) command.....328
 - show interfaces (T3 or E3) command.....347
 - show interfaces (TGM550 module)
 - command.....827
 - show interfaces (Virtual Loopback Tunnel)
 - command.....818
 - show interfaces brief command.....29
 - show interfaces controller (Channelized E1 IQ)
 - command.....615

show interfaces controller (Channelized OC12 IQ) command.....	646	show oam ethernet connectivity-fault-management forwarding-state command.....	258
show interfaces controller (Channelized OC3 IQ and IQE) command.....	645	show oam ethernet connectivity-fault-management interfaces command.....	262
show interfaces controller (Channelized STM1 IQ) command.....	668	show oam ethernet connectivity-fault-management linktrace path-database command.....	281
show interfaces controller (Channelized T1 IQ) command.....	699	show oam ethernet connectivity-fault-management mep-database command.....	269
show interfaces controller (Channelized T3 IQ) command.....	700	show oam ethernet connectivity-fault-management mep-statistics command.....	276
show interfaces demux0 (Demux Interfaces) command.....	368	show oam ethernet connectivity-fault-management path-database command.....	283
show interfaces descriptions command.....	31	show oam ethernet connectivity-fault-management policer command.....	285
show interfaces destination-class command.....	33	show oam ethernet link-fault-management command.....	289
show interfaces detail command.....	35	show ppp address-pool command.....	379
show interfaces diagnostics optics (10-Gigabit Ethernet) command.....	222	show ppp interface command.....	381
show interfaces diagnostics optics (SONET) command.....	483	show ppp statistics command.....	389
show interfaces extensive command.....	37	show ppp summary command.....	395
show interfaces far-end-interval.....	149	show pppoe interfaces command.....	411
show interfaces filters command.....	46	show pppoe service-name-tables command.....	415
show interfaces interface-set command.....	212	show pppoe sessions command.....	417
show interfaces interface-set queue command.....	214	show pppoe statistics command.....	419
show interfaces interval command.....	48	show pppoe underlying-interfaces command.....	421
show interfaces irb command.....	240	show pppoe version command.....	424
show interfaces mac-database (Gigabit Ethernet) command.....	250	show protection-group ethernet-ring aps command.....	298
show interfaces mc-ae.....	254	show protection-group ethernet-ring data-channel command.....	300
show interfaces media command.....	50	show protection-group ethernet-ring interface command.....	302
show interfaces queue command.....	54	show protection-group ethernet-ring node-state command.....	304
show interfaces redundancy command.....	715	show protection-group ethernet-ring statistics command.....	306
show interfaces routing command.....	86	show protection-group ethernet-ring vlan command.....	308
show interfaces routing summary command.....	92	show tgm dynamic-call-admission-control command.....	834
show interfaces routing-instance command.....	94	show tgm fpc command.....	835
show interfaces snmp-index command.....	96	dsp-capacity.....	835
show interfaces source-class command.....	97	show tgm fpc telephony-interface-module command.....	836
show interfaces statistics command.....	99	status.....	836
show interfaces terse command.....	109	show vrrp command.....	315
show isdn calls command.....	588	SNMP index interface information, displaying.....	96
show isdn history command.....	589		
show isdn q921 statistics command.....	590		
show isdn q931 statistics command.....	592		
show isdn status command.....	595		
show lacp interfaces command.....	246		
show oam ethernet connectivity-fault-management delay-statistics command.....	255		

-
- so- interface.....12
 - See also channelized OC3 IQ and IQE interfaces
 - SONET interfaces
 - diagnostics information, displaying.....483
 - SONET/SDH interfaces
 - status information, displaying
 - aggregated.....448
 - standard.....455
 - source class
 - interface information
 - displaying.....97
 - Source class field, content.....117
 - sp- interface.....20
 - described.....20
 - See also adaptive services interfaces
 - statistics
 - interface set
 - clearing.....28
 - interfaces
 - clearing.....27
 - displaying.....99
 - support, technical See technical support
 - symmetric high-speed digital subscriber line See SHDSL
 - syntax conventions.....xix
- T**
- T Series physical interfaces.....10
 - T Series services interfaces.....20
 - T1 interfaces
 - status information, displaying.....328
 - t1- interface.....13
 - See also channelized DS3-to-DS1 interfaces
 - See also channelized T3 IQ and IQE interfaces
 - T3 interfaces
 - status information, displaying.....347
 - t3- interface.....13
 - See also channelized T3 IQ and IQE interfaces
 - tap interface.....10
 - described.....10
 - See also nonconfigurable interfaces
 - technical support
 - contacting JTAC.....xxi
 - TGM550 module
 - CAC information, displaying.....834
 - FPCs, displaying.....835
 - interfaces, displaying.....827
 - MGC list, configuring.....825, 826
 - MGC, list, clearing.....824
 - TIM status, displaying.....836
 - traceroute ethernet.....310
 - traceroute ethernet command.....310
 - tunnel services interfaces.....793, 822
- V**
- virtual loopback tunnel interfaces
 - status information, displaying.....818
 - Virtual Router Redundancy Protocol See VRRP
 - VRF table label
 - traffic statistics.....115
 - VRRP
 - statistics
 - clearing.....314
 - displaying.....315
 - vt- interface.....22
 - described.....22
 - See also virtual loopback tunnel interfaces
- W**
- wildcard characters
 - in interface names.....5
- X**
- xe- interface.....12, 13
 - described.....12, 13
 - See also 10-Gigabit Ethernet interfaces

Index of Statements and Commands

C

clear auto-configuration interfaces command.....	125
clear ilmi statistics command.....	546
clear interfaces interface-set statistics command.....	28, 128
clear interfaces interval command.....	25
clear interfaces mac-database command.....	126
clear interfaces mac-database statistics command.....	127
clear interfaces statistics command.....	27
clear isdn q921 statistics command.....	555
clear isdn q931 statistics command.....	556
clear oam ethernet connectivity-fault-management linktrace path-database command.....	129
clear oam ethernet connectivity-fault-management policer command.....	130
clear oam ethernet connectivity-fault-management statistics.....	131
clear oam ethernet link-fault-management state command.....	132
clear oam ethernet link-fault-management statistics command.....	133
clear ppp statistics command.....	378
clear pppoe sessions command.....	399
clear pppoe statistics command.....	400
clear protection-group ethernet-ring statistics command.....	134
clear tgm fpc command.....	824
clear vrrp command.....	314

P

ping ethernet command.....	135
----------------------------	-----

R

request interface (revert | switchover) (Adaptive Services) command.....	704
request interface (revert | switchover) (Aggregated Ethernet Link Protection) command.....	137
request lacp link-switchover command.....	138
request tgm login fpc command.....	825

S

set tgm fpc command.....	826
show aps command.....	444
show dialer defaults command.....	557
show dialer interfaces command.....	559
show dialer pools command.....	561
show ilmi command.....	547
show ilmi statistics command.....	548
show interfaces (10-Gigabit Ethernet) command.....	189
show interfaces (Adaptive Services) command.....	705
show interfaces (Aggregated Ethernet) command.....	139
show interfaces (Aggregated SONET/SDH) command.....	448
show interfaces (ATM) command.....	496
show interfaces (ATM-over-ADSL) command.....	529
show interfaces (ATM-over-SHDSL) command.....	537
show interfaces (Channelized DS3-to-DS0) command.....	671
show interfaces (Channelized DS3-to-DS1) command.....	682
show interfaces (Channelized E1 IQ) command.....	611
show interfaces (Channelized E1) command.....	600
show interfaces (Channelized OC12 IQ) command.....	641
show interfaces (Channelized OC12) command.....	637
show interfaces (Channelized OC3 IQ and IQE) command.....	618
show interfaces (Channelized STM1 IQ) command.....	665
show interfaces (Channelized STM1) command.....	650
show interfaces (Channelized T1 IQ) command.....	685

show interfaces (Channelized T3 IQ)		show interfaces controller (Channelized STM1 IQ)	
command.....	697	command.....	668
show interfaces (discard) command.....	840	show interfaces controller (Channelized T1 IQ)	
show interfaces (Dynamic Flow Capture)		command.....	699
command.....	726	show interfaces controller (Channelized T3 IQ)	
show interfaces (Encryption) command.....	718	command.....	700
show interfaces (Fast Ethernet) command.....	151	show interfaces demux0 (Demux Interfaces)	
show interfaces (Flow Collector) command.....	730	command.....	368
show interfaces (Flow Monitoring) command.....	736	show interfaces descriptions command.....	31
show interfaces (Gigabit Ethernet) command.....	168	show interfaces destination-class command.....	33
show interfaces (GRE) command.....	794	show interfaces detail command.....	35
show interfaces (IP-over-IP) command.....	800	show interfaces diagnostics optics (10-Gigabit Ethernet) command.....	222
show interfaces (ISDN B-channel) command.....	563	show interfaces diagnostics optics (SONET)	
show interfaces (ISDN BRI) command.....	569	command.....	483
show interfaces (ISDN D-channel) command.....	573	show interfaces extensive command.....	37
show interfaces (ISDN dialer) command.....	579	show interfaces far-end-interval.....	149
show interfaces (J Series Management Ethernet)		show interfaces filters command.....	46
command.....	869	show interfaces interface-set command.....	212
show interfaces (Link Services IQ) command.....	755	show interfaces interface-set queue	
show interfaces (Link Services) command.....	742	command.....	214
show interfaces (Logical Tunnel) command.....	805	show interfaces interval command.....	48
show interfaces (Loopback) command.....	846	show interfaces irb command.....	240
show interfaces (M Series and T Series Management and Internal Ethernet)		show interfaces mac-database (Gigabit Ethernet)	
command.....	855	command.....	250
show interfaces (Multicast Tunnel)		show interfaces mc-ae.....	254
command.....	810	show interfaces media command.....	50
show interfaces (Multilink Services) command.....	771	show interfaces queue command.....	54
show interfaces (PIM) command.....	814	show interfaces redundancy command.....	715
show interfaces (PPPoE) command.....	401	show interfaces routing command.....	86
show interfaces (Redundant Adaptive Services)		show interfaces routing summary command.....	92
command.....	713	show interfaces routing-instance command.....	94
show interfaces (Redundant Link Services IQ)		show interfaces snmp-index command.....	96
command.....	779	show interfaces source-class command.....	97
show interfaces (Serial) command.....	428	show interfaces statistics command.....	99
show interfaces (SONET/SDH) command.....	455	show interfaces terse command.....	109
show interfaces (T1 or E1) command.....	328	show isdn calls command.....	588
show interfaces (T3 or E3) command.....	347	show isdn history command.....	589
show interfaces (TGM550 module)		show isdn q921 statistics command.....	590
command.....	827	show isdn q931 statistics command.....	592
show interfaces (Virtual Loopback Tunnel)		show isdn status command.....	595
command.....	818	show lacp interfaces command.....	246
show interfaces brief command.....	29	show oam ethernet connectivity-fault-management	
show interfaces controller (Channelized E1 IQ)		delay-statistics command.....	255
command.....	615	show oam ethernet connectivity-fault-management	
show interfaces controller (Channelized OC12 IQ)		forwarding-state command.....	258
command.....	646	show oam ethernet connectivity-fault-management	
show interfaces controller (Channelized OC3 IQ and IQE) command.....	645	interfaces command.....	262

show oam ethernet connectivity-fault-management linktrace path-database command.....	281
show oam ethernet connectivity-fault-management mep-database command.....	269
show oam ethernet connectivity-fault-management mep-statistics command.....	276
show oam ethernet connectivity-fault-management path-database command.....	283
show oam ethernet connectivity-fault-management policer command.....	285
show oam ethernet link-fault-management command.....	289
show ppp address-pool command.....	379
show ppp interface command.....	381
show ppp statistics command.....	389
show ppp summary command.....	395
show pppoe interfaces command.....	411
show pppoe service-name-tables command.....	415
show pppoe sessions command.....	417
show pppoe statistics command.....	419
show pppoe underlying-interfaces command.....	421
show pppoe version command.....	424
show protection-group ethernet-ring aps command.....	298
show protection-group ethernet-ring data-channel command.....	300
show protection-group ethernet-ring interface command.....	302
show protection-group ethernet-ring node-state command.....	304
show protection-group ethernet-ring statistics command.....	306
show protection-group ethernet-ring vlan command.....	308
show tgm dynamic-call-admission-control command.....	834
show tgm fpc command.....	835
dsp-capacity.....	835
show tgm fpc telephony-interface-module command.....	836
status.....	836
show vrrp command.....	315
 T	
traceroute ethernet command.....	310

