



Junos[®] OS

Logical Interfaces



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Junos® OS Logical Interfaces

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Documentation and Release Notes

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Supported Platforms

For the features described in this document, the following platforms are supported:

- ACX Series
- M Series
- MX Series
- T Series
- J Series
- PTX Series

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the *CLI User Guide*.

Documentation Conventions

Table 1 on page xiii 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 xiv 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 or emphasizes 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 OS 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; 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.	

GUI Conventions

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

Convention	Description	Examples
Bold text like this	Represents 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 menu 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 post-sales 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:

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- Search for known bugs: <http://www2.juniper.net/kb/>

- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes:
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:
<https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <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, see <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Logical Interfaces on page 3](#)

CHAPTER 1

Logical Interfaces

- [Logical Interfaces Configuration Properties Overview on page 3](#)

Logical Interfaces Configuration Properties Overview

For a physical interface device to function, you must configure at least one logical interface on that device. For each logical interface, you must specify the protocol family that the interface supports. You can also configure other logical interface properties. These vary by Physical Interface Card (PIC) and encapsulation type, but include the IP address of the interface, and whether the interface supports multicast traffic, data-link connection identifiers (DLCIs), virtual channel identifiers (VCIs) and virtual path identifiers (VPIs), and traffic shaping.

Related Documentation

- *Logical Part of an Interface Name*

PART 2

Configuration

- [Logical Interfaces on page 7](#)
- [Network Interfaces Configuration Statements and Hierarchy on page 33](#)
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CHAPTER 2

Logical Interfaces

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Logical Interfaces Configuration Statements

To configure logical interface properties, include the following statements:

```
unit logical-unit-number {  
  accept-source-mac {  
    mac-address mac-address {  
      policer {  
        input cos-policer-name;  
        output cos-policer-name;  
      }  
    }  
  }  
}
```

```
    }
  }
  accounting-profile name;
  allow-any-vci;
  atm-scheduler-map (map-name | default);
  backup-options {
    interface interface-name;
  }
  bandwidth rate;
  cell-bundle-size cells;
  clear-dont-fragment-bit;
  compression {
    rtp {
      f-max-period number;
      queues [ queue-numbers ];
      port {
        minimum port-number;
        maximum port-number;
      }
    }
  }
  }
  compression-device interface-name;
  copy-tos-to-outer-ip-header;
  demux-destination family;
  demux-source family;
  demux-options {
    underlying-interface interface-name;
  }
  description text;
  interface {
    l2tp-interface-id name;
    (dedicated | shared);
  }
  dialer-options {
    activation-delay seconds;
    callback;
    callback-wait-period time;
    deactivation-delay seconds;
    dial-string [ dial-string-numbers ];
    idle-timeout seconds;
    incoming-map {
      caller (caller-id | accept-all);
      initial-route-check seconds;
      load-interval seconds;
      load-threshold number;
      pool pool-name;
      redial-delay time;
      watch-list {
        [ routes ];
      }
    }
  }
  }
  disable;
  disable-mlppp-inner-ppp-pfc;
  dlci dlci-identifier;
  drop-timeout milliseconds;
```



```

dynamic-call-admission-control {
    activation-priority priority;
    bearer-bandwidth-limit kilobits-per-second;
}
encapsulation type;
epd-threshold plp1 cells;
filter filter-name;
fragment-threshold bytes;
inner-vlan-id-range start start-id end end-id;
input-vlan-map {
    inner-tag-protocol-id;
    inner-vlan-id;
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    tag-protocol-id tpid;
    vlan-id number;
}
interleave-fragments;
inverse-arp;
link-layer-overhead percent;
layer2-policer {
    input-policer policer-name;
    input-three-color policer-name;
    output-policer policer-name;
    output-three-color policer-name;
}
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
    up-count cells;
    down-count cells;
}
oam-period (seconds | disable);
output-vlan-map {
    inner-tag-protocol-id;
    inner-vlan-id;
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    tag-protocol-id tpid;
    vlan-id number;
}
passive-monitor-mode;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
    chap {
        access-profile name;
        default-chap-secret name;
        local-name name;
        passive;
    }
}
compression {
    acfc;
}

```

```
    pfc;
}
dynamic-profile profile-name;
lcp-restart-timer milliseconds;
loopback-clear-timer seconds;
ncp-restart-timer milliseconds;
pap {
    default-pap-password password;
    local-name name;
    local-password password;
    passive;
}
pppoe-options {
    access-concentrator name;
    auto-reconnect seconds;
    (client | server);
    service-name name;
    underlying-interface interface-name;
}
proxy-arp;
service-domain (inside | outside);
shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained rate burst
    length);
    queue-length number;
}
short-sequence;
transmit-weight number;
(traps | no-traps);
trunk-bandwidth rate;
trunk-id number;
tunnel {
    backup-destination address;
    destination address;
    key number;
    routing-instance {
        destination routing-instance-name;
    }
    source source-address;
    ttl number;
}
vci vpi-identifier.vci-identifier;
vci-range start start-vci end end-vci;
vpi vpi-identifier;
vlan-id number;
vlan-id-range number-number;
vlan-tags inner tpid.vlan-id outer tpid.vlan-id;
family family {
    [ family-statements ];
}
}
```

You can include these statements at the following hierarchy levels:

- [edit interfaces *interface-name*]

- [edit logical-systems *logical-system-name* interfaces *interface-name*]

For information about interface-specific logical properties, see [Table 3 on page 11](#).

Logical Interfaces Statements List

[Table 3 on page 11](#) lists statements that you can use to configure logical interfaces.

Table 3: Statements for Logical Interface Properties

Statement	Interface Types	Usage Guidelines
access-profile <i>name</i>	ATM2 IQ interfaces	"Configuring PPP PAP Authentication" on page 28
accept-source-mac	Gigabit Ethernet intelligent queuing (IQ) interfaces	<i>Configuring Gigabit Ethernet Policers</i>
accounting-profile <i>name</i>	All	"Configuring Accounting for the Logical Interface" on page 21
activation-delay <i>seconds</i>	ISDN interfaces	<i>ISDN Interfaces Overview</i>
activation-priority <i>priority</i>	Fast Ethernet and Gigabit Ethernet interfaces, ISDN BRI interfaces, and serial interfaces with PPP or Frame Relay encapsulation on J4350 and J6350 Services Routers supporting voice over IP with the TGM550 media gateway module	"Configuring Dynamic Call Admission Control" on page 30
adaptive-shapers <i>adaptive-shaper-name</i>	Frame Relay interfaces on J Series routers	<i>Junos OS Class of Service Library for Routing Devices</i>
allow-any-vci	Asynchronous Transfer Mode (ATM) interfaces	<i>Configuring ATM Interface Encapsulation</i>
atm-scheduler-map (<i>map-name</i> default)	ATM2 IQ interfaces	<i>Configuring ATM2 IQ VC Tunnel CoS Components</i>
backup-destination <i>address</i>	Encryption interfaces	<i>Junos OS Class of Service Library for Routing Devices</i>
backup-options	J Series routers ISDN interfaces	<i>Configuring ISDN Logical Interface Properties</i>
bandwidth <i>rate</i>	All interfaces, except multilink and aggregated	"Configuring the Interface Bandwidth" on page 23
bearer-bandwidth-limit <i>kilobits-per-second</i>	Fast Ethernet and Gigabit Ethernet interfaces, ISDN BRI interfaces, and serial interfaces with PPP or Frame Relay encapsulation on J4350 and J6350 Services Routers supporting voice over IP with the TGM550 media gateway module	"Configuring Dynamic Call Admission Control" on page 30

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
<code>cbr rate</code>	ATM interfaces	<i>Defining the ATM Traffic-Shaping Profile</i>
<code>cell-bundle-size cells</code>	ATM2 IQ interfaces	<i>Configuring the Layer 2 Circuit Cell-Relay Cell Maximum</i>
<code>clear-dont-fragment-bit</code>	Adaptive services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>compression</code>	AS PIC or MultiServices PIC link services IQ interfaces (lsq) and voice services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>compression-device interface-name</code>	J Series routers E1 and T1 interfaces.	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>copy-tos-to-outer-ip-header</code>	GRE tunnel interfaces	<i>Junos OS Class of Service Library for Routing Devices</i>
<code>deactivation-delay seconds</code>	ISDN interfaces	<i>ISDN Interfaces Overview</i>
<code>demux-destination family</code>	IP demux interfaces	<i>Configuring an IP Demux Underlying Interface</i>
<code>demux-options family</code>	IP demux interfaces	<i>Specifying the Demux Underlying Interface</i>
<code>demux-source family</code>	IP demux interfaces	<i>Configuring an IP Demux Underlying Interface</i>
<code>description text</code>	All	“Adding a Logical Unit Description to the Configuration” on page 19
<code>destination (address routing-instance-name)</code>	Encryption generic routing encapsulation (GRE) tunnel, and IP tunnel interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>dialer-options</code>	J Series routers ISDN interfaces	<i>Configuring ISDN Physical Interface Properties</i>
<code>disable</code>	All	“Disabling a Logical Interface” on page 31
<code>disable-mlppp-inner-ppp-pfc</code>	MLPPP interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>dlci dlci-identifier</code>	Point-to-point interfaces with Frame Relay encapsulation	<i>Configuring Frame Relay DLCIs</i>
<code>drop-timeout milliseconds</code>	Multilink interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
<code>dynamic-call-admission-control</code>	Fast Ethernet and Gigabit Ethernet interfaces, ISDN BRI interfaces, and serial interfaces with PPP or Frame Relay encapsulation on J4350 and J6350 Services Routers supporting voice over IP with the TGM550 media gateway module	"Configuring Dynamic Call Admission Control" on page 30
<code>dynamic-profile profile-name</code>	1-Gigabit Ethernet and 10-Gigabit Ethernet interfaces configured with PPP over Ethernet on M120 and M320 routers	<i>Junos Subscriber Access Configuration Guide</i>
<code>encapsulation type</code>	All interfaces, except aggregated SONET/SDH and loopback	"Configuring the Encapsulation on a Logical Interface" on page 24
<code>epd-threshold cells</code>	ATM2 IQ interfaces	<i>Configuring the ATM2 IQ EPD Threshold</i>
<code>f-max-period number</code>	AS PIC or MultiServices link services IQ interfaces (<code>lsq-</code>) and voice services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>family</code>	All	<i>Configuring the Protocol Family</i>
<code>fragment-threshold bytes</code>	Multilink interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>frame-relay map-name default)</code>	Frame Relay Interfaces on J Series routers	<i>Junos OS Services Interfaces Library for Routing Devices and Junos OS Class of Service Library for Routing Devices</i>
<code>idle-timeout</code>	ISDN interfaces	<i>Configuring ISDN Logical Interface Properties</i>
<code>initial-route-check seconds</code>	ISDN interfaces	<i>Configuring ISDN Logical Interface Properties</i>
<code>inner-tag-protocol-id</code>	Gigabit Ethernet IQ interfaces	<i>802.1Q VLANs Overview</i>
<code>inner-vlan-id</code>	Gigabit Ethernet IQ interfaces	<i>802.1Q VLANs Overview</i>
<code>inner-vlan-id-range</code>	Gigabit Ethernet, 10-Gigabit Ethernet, and aggregated Ethernet IQ interfaces	<i>Configuring ATM-to-Ethernet Interworking</i>
<code>input</code>	AS PIC or MultiServices link services	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>input-policer policer-name</code>	For 1-Gigabit Ethernet and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces on M Series and T Series routers	<i>Junos OS Services Interfaces Library for Routing Devices and Configuring Gigabit Ethernet Two-Color and Tricolor Policers</i>

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
<code>input-three-color</code> <i>policer-name</i>	For 1-Gigabit Ethernet and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces on M Series and T Series routers	<i>Junos OS Class of Service Library for Routing Devices and Configuring Gigabit Ethernet Two-Color and Tricolor Policers</i>
<code>input-vlan-map</code>	Gigabit Ethernet IQ interfaces	<i>Stacking and Rewriting Gigabit Ethernet VLAN Tags Overview</i>
<code>interleave-fragments</code>	Link services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>inverse-arp</code>	Interfaces with ATM and Frame Relay encapsulation	<i>Configuring Inverse ATM1 or ATM2 ARP and Configuring Inverse Frame Relay ARP</i>
<code>key</code> <i>number</i>	GRE tunnel interfaces on Adaptive Services PICs	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>layer2-policer</code>	1-Gigabit Ethernet and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces	<i>Configuring Gigabit Ethernet Two-Color and Tricolor Policers</i>
<code>lcp-restart-timer</code>	Interfaces with PPP encapsulation	“Configuring the PPP Restart Timers” on page 26
<code>l2tp-interface-id</code> <i>name</i>	Adaptive services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>link-layer-overhead</code> <i>percent</i>	AS PIC or MultiServices link services IQ interfaces (lsq)	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>load-threshold</code> <i>number</i>	ISDN interfaces	<i>Configuring ISDN Logical Interface Properties</i>
<code>local-name</code> <i>name</i>	ATM2 IQ interfaces	“Configuring PPP CHAP Authentication” on page 27 and “Configuring PPP PAP Authentication” on page 28
<code>loss-priority-maps</code>	Frame Relay interfaces on J Series routers	<i>Junos OS Services Interfaces Library for Routing Devices and Junos OS Class of Service Library for Routing Devices</i>
<code>mac-address</code> <i>mac-address</i>	Gigabit Ethernet interfaces and Gigabit Ethernet IQ and IQE interfaces with small form-factor pluggable transceivers (SFPs) (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i router)	<i>Configuring Gigabit Ethernet Policers</i>
<code>minimum-links</code> <i>number</i>	Multilink interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>mrru</code> <i>bytes</i>	Multilink interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
multicast-dlci <i>dlci-identifier</i>	Point-to-multipoint Frame Relay interfaces	<i>Configuring Frame Relay DLCIs</i>
multicast-vci <i>vpi-identifier vci-identifier</i>	Point-to-multipoint ATM1 and ATM2 IQ interfaces	<i>Configuring the ATM OAM F5 Loopback Cell Threshold</i>
multilink-max-classes <i>number</i>	AS PIC or MultiServices link services IQ interfaces (lsq-)	<i>Junos OS Services Interfaces Library for Routing Devices</i>
multipoint	All	"Configuring a Multipoint Connection" on page 21
ncp-restart-timer	Interfaces with PPP encapsulation	"Configuring the PPP Restart Timers" on page 26
oam-liveness	ATM1 and ATM2 IQ interfaces	<i>Configuring the ATM OAM F5 Loopback Cell Threshold</i>
oam-period (disable seconds)	ATM1 and ATM2 IQ interfaces	<i>Defining the ATM OAM F5 Loopback Cell Period</i>
output	All	<i>Junos OS Services Interfaces Library for Routing Devices</i>
output-policer <i>policer-name</i>	For 1-Gigabit Ethernet and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces on M Series and T Series routers	<i>Junos OS Class of Service Library for Routing Devices and Configuring Gigabit Ethernet Two-Color and Tricolor Policers</i>
output-three-color <i>policer-name</i>	For 1-Gigabit Ethernet and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces on M Series and T Series routers	<i>Junos OS Class of Service Library for Routing Devices and Configuring Gigabit Ethernet Two-Color and Tricolor Policers</i>
output-vlan-map	Gigabit Ethernet IQ interfaces	<i>Stacking and Rewriting Gigabit Ethernet VLAN Tags Overview</i>
passive (CHAP)	ATM2 IQ interfaces	"Configuring PPP CHAP Authentication" on page 27
passive (PAP)	ATM2 IQ interfaces	"Configuring PPP PAP Authentication" on page 28
passive-monitor-mode	SONET/SDH interfaces	<i>Enabling Passive Monitoring on SONET/SDH Interfaces</i>
peer-unit <i>unit-number</i>	Logical tunnel interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
pfc	Interfaces with PPP, PPP CCC, or PPP TCC encapsulation	<i>Configuring the PPP Protocol Field Compression</i>

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
<code>plp1 cells</code>	ATM2 IQ interfaces	<i>Configuring the ATM2 IQ EPD Threshold</i>
<code>plp-to-clp</code>	ATM2 IQ interfaces	<i>Configuring ATM2 IQ VC Tunnel CoS Components</i>
<code>point-to-point</code>	All	“Configuring a Point-to-Point Connection” on page 21
<code>policer</code>	Gigabit Ethernet and Gigabit Ethernet IQ and IQE PICs with SFPs (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i router)	<i>Configuring Gigabit Ethernet Policers</i>
<code>pop</code>	Gigabit Ethernet IQ interfaces	<i>Removing a VLAN Tag</i>
<code>pop-pop</code>	Gigabit Ethernet IQ interfaces	<i>Removing the Outer and Inner VLAN Tags</i>
<code>pop-swap</code>	Gigabit Ethernet IQ interfaces	<i>Removing the Outer VLAN Tag and Rewriting the Inner VLAN Tag</i>
<code>port</code>	AS PIC or MultiServices or MultiServices link services IQ interfaces (lsq) and voice services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>ppp-options</code>	Interfaces with PPP, PPP CCC, or PPP TCC encapsulation	“Configuring PPP CHAP Authentication” on page 27 and “Configuring PPP PAP Authentication” on page 28
<code>proxy-arp</code>	Ethernet interfaces	<i>Configuring Restricted and Unrestricted Proxy ARP</i>
<code>push</code>	Gigabit Ethernet IQ interfaces	<i>Stacking a VLAN Tag</i>
<code>push-push</code>	Gigabit Ethernet IQ interfaces	<i>Stacking Two VLAN Tags</i>
<code>queue-length number</code>	ATM1 interfaces	<i>Configuring the ATM1 Queue Length</i>
<code>queues [queue-numbers]</code>	AS PIC or MultiServices link services IQ interfaces (lsq) and voice services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>routing-instance</code>	GRE tunnel and IP tunnel interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
<code>rtp</code>	AS PIC or MultiServices link services IQ interfaces (lsq) and voice services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
rtvbr peak rate sustained rate burst length	ATM2 interfaces	<i>Defining the ATM Traffic-Shaping Profile</i>
service-domain (inside outside)	Adaptive services interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
shaping	ATM1 and ATM2 IQ interfaces	<i>Defining the ATM Traffic-Shaping Profile</i>
short-sequence	Multilink interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
source source-address	Encryption, GRE tunnel, and IP tunnel interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
swap	Gigabit Ethernet IQ interfaces	<i>Configuring Frames with Particular TPIDs to Be Processed as Tagged Frames</i>
swap-push	Gigabit Ethernet IQ interfaces	<i>Rewriting a VLAN Tag and Adding a New Tag</i>
swap-swap	Gigabit Ethernet IQ interfaces	<i>Rewriting the Inner and Outer VLAN Tags</i>
tag-protocol-id tpid	Gigabit Ethernet and Gigabit Ethernet IQ and IQE PICs with SFPs (except the 10-port Gigabit Ethernet PIC, Aggregated Ethernet with Gigabit Ethernet IQ interfaces, and the built-in Gigabit Ethernet port on the M7I router)	<i>Rewriting the VLAN Tag on Tagged Frames</i>
transmit-weight number	ATM2 IQ interfaces	<i>Configuring the ATM2 IQ Transmission Weight</i>
(traps no-traps)	All	<i>"Enabling or Disabling SNMP Notifications on Logical Interfaces" on page 19</i>
trunk-bandwidth rate	ATM2 IQ interfaces	<i>Configuring Layer 2 Circuit Trunk Mode Scheduling</i>
trunk-id number	ATM2 IQ interfaces	<i>Configuring Layer 2 Circuit Transport Mode</i>
ttl number	GRE tunnel and IP tunnel interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
tunnel	Encryption, GRE tunnel, and IP tunnel interfaces	<i>Junos OS Services Interfaces Library for Routing Devices</i>
underlying-interface	IP demux interfaces	<i>Specifying the Demux Underlying Interface</i>
vbr peak rate sustained rate burst length	ATM interfaces	<i>Defining the ATM Traffic-Shaping Profile</i>

Table 3: Statements for Logical Interface Properties (*continued*)

Statement	Interface Types	Usage Guidelines
<code>vci vpi-identifier vci-identifier</code>	ATM1 and ATM2 IQ point-to-point interfaces	<i>Configuring a Point-to-Point ATM1 or ATM2 IQ Connection</i>
<code>vci-range</code>	ATM2 IQ interfaces	<i>Configuring ATM-to-Ethernet Interworking</i>
<code>vpi vpi-identifier</code>	ATM1 and ATM2 IQ point-to-point interfaces	<i>Configuring a Point-to-Point ATM1 or ATM2 IQ Connection</i>
<code>vlan-id number</code>	Fast Ethernet, Gigabit Ethernet, and Gigabit Ethernet IQ interfaces and aggregated Ethernet using Gigabit Ethernet IQ interfaces	<i>Binding VLAN IDs to Logical Interfaces and Rewriting the VLAN Tag on Tagged Frames</i>
<code>vlan-tags inner tpidvlan-id outer tpidvlan-id</code>	Gigabit Ethernet IQ interfaces	<i>Configuring Dual VLAN Tags</i>
<code>watch-list</code>	ISDN interfaces	<i>Configuring ISDN Logical Interface Properties</i>

Specifying the Logical Interface Number

Each logical interface must have a logical unit number. The logical unit number corresponds to the logical unit part of the interface name. For more information, see *Interface Naming Overview*.

Point-to-Point Protocol (PPP), Cisco High-level Data Link Control (HDLC), and Ethernet circuit cross-connect (CCC) encapsulations support only a single logical interface, whose logical unit number must be 0. Frame Relay and ATM encapsulations support multiple logical interfaces, so you can configure one or more logical unit numbers.

You specify the logical unit number by including the `unit` statement:

```
unit logical-unit-number {
  ...
}
```

You can include this statement at the following hierarchy levels:

- `[edit interfaces interface-name]`
- `[edit logical-systems logical-system-name interfaces interface-name]`

The logical unit number can be in the range 0 through 65,535 for demux and PPPoE static interfaces only. The logical unit number can be in the range 0 through 16,385 for all other static interface types.

Adding a Logical Unit Description to the Configuration

You can include a text description of each logical unit in the configuration file. Any descriptive text you include is displayed in the output of the **show interfaces** commands, and is also exposed in the **ifAlias** Management Information Base (MIB) object. It has no impact on the interface's configuration. To add a text description, include the **description** statement:

```
description text;
```

You can include this statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]

The description can be a single line of text. If the text contains spaces, enclose it in quotation marks.



NOTE: You can configure the extended DHCP relay to include the interface description in the option 82 Agent Circuit ID suboption. See “*Enabling and Disabling Insertion of Option 82 Information*” in the *Junos OS Subscriber Management and Services Library*.

For information about describing physical interfaces, see *Configuring Interface Description*.

Enabling or Disabling SNMP Notifications on Logical Interfaces

By default, Simple Network Management Protocol (SNMP) notifications are sent when the state of an interface or a connection changes. To explicitly enable these notifications on the logical interface, include the **traps** statement; to disable these notifications on the logical interface, include the **no-traps** statement:

```
(traps | no-traps);
```

You can include these statements at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]



NOTE: Gigabit Ethernet interfaces on J Series routers do not support SNMP.

Configuring Logical System Interface Properties

With Junos OS, you can partition a single physical router into multiple logical devices that perform independent routing tasks. Because logical systems perform a subset of the tasks once handled by the physical router, logical systems offer an effective way to maximize the use of a single router.

You can include the following logical system statements:

```
[edit logical-systems logical-system-name]  
interfaces interface-name {  
  unit logical-unit-number {  
    logical-interface-statements;  
  }  
}  
policy-options {  
  policy-options-statements;  
}  
protocols {  
  protocols-statements;  
}  
routing-instances {  
  routing-instances-statements;  
}  
routing-options {  
  routing-options-statements;  
}
```

For an overview of logical systems, see the *Junos OS Feature Guides*. For detailed information about logical system configuration, see the *Junos OS Routing Protocols Library for Routing Devices*. For information about configuring peer relationships between logical systems, see *Junos OS Services Interfaces Library for Routing Devices*.

To configure interface properties of a logical system, you must include the following statements at the **[edit logical-systems *logical-system-name*]** hierarchy level:

```
[edit logical-systems logical-system-name]  
interfaces interface-name {  
  unit logical-unit-number {  
    logical-interface-statements;  
  }  
}
```

Example: Configuring Logical System Interface Properties

Configure a logical system's interface properties:

```
[edit interfaces t3-0/0/1]  
description "Physical interface to be partitioned into multiple logical systems";  
[edit logical-systems 1-on-t3-0/0/1]  
interfaces t3-0/0/1 {  
  unit 1 {  
    family inet {  
      address 10.0.0.1/32 {
```

```

        destination 10.0.0.2;
    }
}
}
}

```

Related Documentation

- [\[edit logical-systems\] Hierarchy Level](#)

Configuring a Point-to-Point Connection

By default, all interfaces are assumed to be point-to-point connections. You must ensure that the maximum transmission unit (MTU) sizes on both sides of the connection are the same.

For all interfaces except aggregated Ethernet, Fast Ethernet, and Gigabit Ethernet, you can explicitly configure an interface to be a point-to-point connection by including the **point-to-point** statement:

```
point-to-point;
```

You can include this statement at the following hierarchy levels:

- [\[edit interfaces *interface-name* unit *logical-unit-number*\]](#)
- [\[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*\]](#)

Configuring a Multipoint Connection

By default, all interfaces are assumed to be point-to-point connections. To configure an interface to be a multipoint connection, include the **multipoint** statement:

```
multipoint;
```

You can include this statement at the following hierarchy levels:

- [\[edit interfaces *interface-name* unit *logical-unit-number*\]](#)
- [\[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*\]](#)

Configuring Accounting for the Logical Interface

Juniper Networks routers or switches can collect various kinds of data about traffic passing through the router or switch. You can set up one or more *accounting profiles* that specify some common characteristics of this data, including the following:

- The fields used in the accounting records
- The number of files that the router or switch retains before discarding, and the number of bytes per file
- The period that the system uses to record the data

You configure the profiles and define a unique name for each profile using statements at the **[edit accounting-options]** hierarchy level. There are two types of accounting profiles: interface profiles and filter profiles. You configure interface profiles by including the **interface-profile** statement at the **[edit accounting-options]** hierarchy level. You configure filter profiles by including the **filter-profile** statement at the **[edit accounting-options]** hierarchy level. For more information, see the *Network Management Administration Guide for Routing Devices*.

You apply filter profiles by including the **accounting-profile** statement at the **[edit firewall filter *filter-name*]** and **[edit firewall family *family* filter *filter-name*]** hierarchy levels. For more information, see the *Routing Policy Feature Guide for Routing Devices*.

Applying an Accounting Profile to the Logical Interface

To enable accounting on a logical interface, include the **accounting-profile** statement:

```
accounting-profile name;
```

You can include this statement at the following hierarchy level:

- **[edit interfaces *interface-name* unit *logical-unit-number*]**

You can also reference profiles for the physical interface; for more information, see *Configuring Accounting for the Physical Interface*.

Example: Applying an Accounting Profile to the Logical Interface

Configure an accounting profile for an interface and apply it to a logical interface:

```
[edit]
accounting-options {
  file if_stats {
    size 4m files 10 transfer-interval 15;
    archive-sites {
      "ftp://login:password@host/path";
    }
  }
}
interface-profile if_profile {
  interval 15;
  file if_stats {
    fields {
      input-bytes;
      output-bytes;
      input-packets;
      output-packets;
      input-errors;
      output-errors;
    }
  }
}
}
[edit interfaces ge-1/0/1 unit 1]
accounting-profile if_profile;
```

To reference profiles by physical interface, see *Configuring Accounting for the Physical Interface*. For information about configuring a firewall filter accounting profile, see the *Routing Policy Feature Guide for Routing Devices*.

Configuring the Interface Bandwidth

By default, the Junos OS uses the physical interface's speed for the MIB-II object, **ifSpeed**. You can configure the logical unit to populate the **ifSpeed** variable by configuring a bandwidth value for the logical interface. The **bandwidth** statement sets an informational-only parameter; you cannot adjust the actual bandwidth of an interface with this statement.



NOTE: We recommend that you be careful when setting this value. Any interface bandwidth value that you configure using the **bandwidth** statement affects how the interface cost is calculated for a dynamic routing protocol, such as OSPF. By default, the interface cost for a dynamic routing protocol is calculated using the following formula:

$$\text{cost} = \text{reference-bandwidth} / \text{bandwidth},$$

where **bandwidth** is the physical interface speed. However, if you specify a value for **bandwidth** using the **bandwidth** statement, that value is used to calculate the interface cost, rather than the actual physical interface bandwidth.

To configure the bandwidth value for a logical interface, include the **bandwidth** statement:

bandwidth *rate*;

You can include this statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]

rate is the peak rate, in bps or cps. You can specify a value in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation **k** (1000), **m** (1,000,000), or **g** (1,000,000,000). You can also specify a value in cells per second by entering a decimal number followed by the abbreviation **c**; values expressed in cells per second are converted to bits per second using the formula 1 cps = 384 bps. The value can be any positive integer. The **bandwidth** statement is valid for all logical interfaces, except multilink interfaces.

Configuring Interface Encapsulation on Logical Interfaces

PPP encapsulation is the default encapsulation type for physical interfaces. You need not configure encapsulation for any physical interfaces that support PPP encapsulation. If you do not configure encapsulation, PPP is used by default. For physical interfaces that do not support PPP encapsulation, you must configure an encapsulation to use for

packets transmitted on the interface. For more information about physical interface encapsulation, see *Configuring Interface Encapsulation on Physical Interfaces*.

You can optionally configure an encapsulation on a logical interface, which is the encapsulation used within certain packet types.

Configuring the Encapsulation on a Logical Interface

Generally, you configure an interface's encapsulation at the `[edit interfaces interface-name]` hierarchy level. However, for some encapsulation types, such as Frame Relay, ATM, and Ethernet virtual local area network (VLAN) encapsulations, you can also configure the encapsulation type that is used inside the Frame Relay, ATM, or VLAN circuit itself. To do this, include the **encapsulation** statement:

```
encapsulation (atm-ccc-cell-relay | atm-ccc-vc-mux | atm-tcc-vc-mux | atm-cisco-nlpid  
| atm-mlppp-llc | atm-nlpid | atm-ppp-llc | atm-ppp-vc-mux | atm-snap | atm-tcc-snap  
| atm-vc-mux | ether-over-atm-llc | ether-vpls-over-atm-llc | ethernet |  
frame-relay-ether-type | frame-relay-ether-type-tcc | frame-relay-ccc | frame-relay-tcc  
| multilink-frame-relay-end-to-end | multilink-ppp | vlan-ccc | vlan-tcc | vlan-vpls);
```

You can include this statement at the following hierarchy levels:

- `[edit interfaces interface-name unit logical-unit-number]`
- `[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number]`

Some of the ATM encapsulations are defined in RFC 2684, *Multiprotocol Encapsulation over ATM Adaptation Layer 5*.

The following restrictions apply to logical interface encapsulation:

- With the atm-nlpid, atm-cisco-nlpid, and atm-vc-mux encapsulations, you can configure the inet family only.
- With the CCC circuit encapsulations, you cannot configure a family on the logical interface.
- A logical interface cannot have frame-relay-ccc encapsulation unless the physical device also has frame-relay-ccc encapsulation.
- A logical interface cannot have frame-relay-tcc encapsulation unless the physical device also has frame-relay-tcc encapsulation. In addition, you must assign this logical interface a DLCI from 512 through 1022 and configure it as point-to-point.
- A logical interface cannot have frame-relay-ether-type or frame-relay-ether-type-tcc encapsulation unless the physical interface has flexible-frame-relay encapsulation and is on an IQ or IQE PIC.
- For frame-relay-ether-type-tcc encapsulation, you must assign this logical interface a DLCI from 512 through 1022.
- For interfaces that carry IP version 6 (IPv6) traffic, you cannot configure ether-over-atm-llc encapsulation.

- When you use ether-over-atm-llc encapsulation, you cannot configure multipoint interfaces.
- A logical interface cannot have vlan-ccc or vlan-vpls encapsulation unless the physical device also has vlan-ccc or vlan-vpls encapsulation, respectively. In addition, you must assign this logical interface a VLAN ID from 512 through 1023; if the VLAN ID is 511 or lower, it is subject to the normal destination filter lookups in addition to source address filtering. For more information, see *Configuring VLAN Encapsulation*.
- You can create an ATM cell-relay circuit by configuring an entire ATM physical device or an individual virtual circuit (VC). When you configure an entire device, only cell-relay encapsulation is allowed on the logical interfaces. For more information, see *Configuring an ATM Cell-Relay Circuit*.

For more information about ATM encapsulations, see *Configuring ATM Interface Encapsulation*.

For more information about Frame Relay encapsulations, see *Configuring Frame Relay Interface Encapsulation*.

For more information about multilink encapsulations, see the *Junos OS Services Interfaces Library for Routing Devices*.

Configuring the LCP Configure-Request Maximum Sent

Link Control Protocol (LCP) Configure-Request is used to establish a link. You can configure the maximum number of LCP Configure-Requests to send. The router stops sending LCP Configure-Requests after the specified maximum number is sent. To configure the LCP Configure-Request maximum, use the **lcp-max-conf-req** statement at the **[edit interfaces interface-name unit number ppp-options]** hierarchy level. The **number** range is from 0 to 65,535; where 0 specifies no limit and the LCP Configure-Request is sent indefinitely. The default is 254.

Related Documentation

- [lcp-max-conf-req on page 119](#)

Configuring the NCP Configure-Request Maximum Sent

Network Control Protocol (NCP) Configure-Request is used to establish a link. You can configure the maximum number of NCP Configure-Requests to send. The router stops sending NCP Configure-Requests after the specified maximum number is sent. To configure the NCP Configure-Request maximum, use the **ncp-max-conf-req** statement at the **[edit interfaces interface-name unit number ppp-options]** hierarchy level. The **number** range is from 0 to 65,535; where 0 specifies no limit and NCP Configure-Request is sent indefinitely. The default is 254.

Related Documentation

- [ppp-options on page 147](#)

Configuring the PPP Restart Timers

You can configure a restart timer for the Link Control Protocol (LCP) and Network Control Protocol (NCP) components of a PPP session. You can configure the LCP restart timer on interfaces with PPP, PPP TCC, PPP over Ethernet, PPP over ATM, and PPP over Frame Relay encapsulations. You can configure the NCP restart timer on interfaces with PPP and PPP TCC encapsulations and on multilink PPP bundle interfaces.

To configure the restart timer for the NCP component of a PPP session, include the **ncp-restart-timer** statement, and specify the number of milliseconds.

To configure the restart timer for the LCP component of a PPP session, include the **lcp-restart-timer** statement, and specify the number of milliseconds:

```
lcp-restart-timer milliseconds;  
ncp-restart-timer milliseconds;
```

You can include these statements at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* ppp-options]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* ppp-options]

To monitor the configuration, issue the **show interfaces *interface-name*** command. Configured options are displayed in the **PPP parameters** field for the physical interface.

```
user@host> run show interfaces t1-0/0/0:1:1.0 detail  
Logical interface t1-0/0/0:1:1.0 (Index 67) (SNMP ifIndex 40)  
(Generation 156)  
Flags: Hardware-Down Device-Down Point-To-Point SNMP-Traps 0x4000  
Encapsulation: PPP  
PPP parameters:  
  LCP restart timer: 2000 msec  
  NCP restart timer: 2000 msec  
Protocol inet, MTU: 1500, Generation: 163, Route table: 0  
Flags: Protocol-Down  
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary  
Destination: 1.1.1/24, Local: 1.1.1.2, Broadcast: 1.1.1.255,
```

Configuring the PPP Clear Loop Detected Timer

When a Point-to-Point Protocol (PPP) session detects a loop, the loop detected flag is set. If the flag is not cleared by the protocol after the loopback is cleared, the clear loop detected timer clears the flag after the specified time has elapsed.

To configure the clear loop detected timer for the LCP component of a PPP session, include the **loopback-clear-timer** statement, and specify the number of seconds.

```
loopback-clear-timer seconds;
```

You can include this statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* ppp-options]

- `[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-options]`

To monitor the configuration, issue the `show interfaces interface-name extensive` command.

Configuring Dynamic Profiles for PPP

A dynamic profile acts as a template that enables you to create, update, or remove a configuration that includes attributes for client access (for example, interface or protocol) or service (for example, IGMP). Using these profiles you can consolidate all of the common attributes of a client (and eventually a group of clients) and apply the attributes simultaneously.

After they are created, the profiles reside in a profile library on the router. You can then use the **dynamic-profile** statement to attach profiles to interfaces. To assign a dynamic profile to a PPP interface, you can include the **dynamic-profile** statement at the `[edit interfaces interface-name unit logical-unit-number ppp-options]` hierarchy level:

```
[edit interfaces interface-name unit logical-unit-number ppp-options]
  dynamic-profile profile-name;
```

To monitor the configuration, issue the `show interfaces interface-name` command.

For information about dynamic profiles, see *Dynamic Profiles Overview* in the *Junos Subscriber Access Configuration Guide*.

For information about creating dynamic profiles, see *Configuring a Basic Dynamic Profile* in the *Junos Subscriber Access Configuration Guide*.

For information about assigning a dynamic profile to a PPP interface, see *Attaching Dynamic Profiles to Static PPP Subscriber Interfaces* in the *Junos Subscriber Access Configuration Guide*.



NOTE: Dynamic profiles for PPP subscribers are supported only on PPPoE interfaces for this release.

Related Documentation

- *Configuring Dynamic Authentication for PPP Subscribers*

Configuring PPP CHAP Authentication

For interfaces with PPP encapsulation, you can configure interfaces to support the PPP Challenge Handshake Authentication Protocol (CHAP), as defined in RFC 1994, *PPP Challenge Handshake Authentication Protocol (CHAP)*. When you enable CHAP on an interface, the interface can authenticate its peer and can be authenticated by its peer.

For information about configuring CHAP, see *Configuring the PPP Challenge Handshake Authentication Protocol*.

Configuring PPP PAP Authentication

The Password Authentication Protocol (PAP) provides a simple method for the peer to establish its identity using a two-way handshake. This is done only upon initial link establishment.

After the link is established, an ID and password pair is repeatedly sent by the peer to the authenticator until authentication is acknowledged or the connection is terminated.

To configure PAP, you must create an access profile, configure tracing operations, and configure the logical and physical interfaces.

To configure PAP on a logical interface with PPP encapsulation, include the **pap** statement with options:

```
pap {  
  default-pap-password password;  
  local-name name;  
  local-password password;  
  passive;  
}
```

You can include these statements at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]

For more information about configuring PAP for physical interfaces, see *Configuring the PPP Password Authentication Protocol*. For information about configuring tracing operations for the PPP protocol, see *Tracing Operations of the pppd Process*.

On each logical interface with PPP encapsulation, you can perform the following tasks:

- [Configuring a Default PAP Password on page 28](#)
- [Configuring the Local Name on page 29](#)
- [Configuring the Local Password on page 29](#)
- [Configuring Passive Mode on page 29](#)

Configuring a Default PAP Password

The default PAP password is used when no matching PAP access profile exists, or if the PAP access profile name changes during PPP link negotiation.

To configure a default PAP password for an interface, include the **default-pap-password** statement:

```
default-pap-password password;
```

You can include the statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* ppp-options pap]

- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* ppp-options pap]

Configuring the Local Name

By default, when PAP is enabled on an interface, the interface uses the router's system hostname as the name sent in PAP request and response packets.

To configure the name the interface uses in PAP request and response packets, include the **local-name** statement:

```
local-name name;
```

You can include the statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* ppp-options pap]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* ppp-options pap]

Configuring the Local Password

You need to configure the password to be used for authentication.

To configure the host password for sending PAP requests, include the **local-password** statement:

```
local-password password;
```

You can include the statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* ppp-options pap]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* ppp-options pap]

Configuring Passive Mode

By default, when PAP is enabled on an interface, the interface expects authenticate-request packets from the peer. However, the interface can be configured to send authentication request packets to the peer by configuring PAP to operate in passive mode. In PAP passive mode, the interface sends the authenticate-request packets to the peer only if the interface receives the PAP option from the peer during LCP negotiation—in passive mode, the interface does not authenticate the peer.

To configure the interface to authenticate with PAP in passive mode, include the **passive** statement:

```
passive;
```

You can include the statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* ppp-options pap]

- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* **ppp-options** **pap**]

Configuring Dynamic Call Admission Control

Dynamic call admission control (CAC) provides enhanced control over WAN bandwidth. You can configure dynamic CAC on J4350 and J6350 Services Routers supporting voice over IP through the TGM550 media gateway module. It can be used with the following interfaces:

- Fast Ethernet and Gigabit Ethernet interfaces
- ISDN BRI interfaces
- Serial interfaces with PPP or Frame Relay encapsulation

When dynamic CAC is configured on an interface responsible for providing call bandwidth, the TGM550 informs the Media Gateway Controller (MGC) of the bandwidth limit available for voice packets on the interface and requests the MGC to block new calls when the bandwidth is exhausted.

Dynamic CAC is useful when a primary link becomes unavailable and a backup link with less bandwidth takes its place. Without dynamic CAC, the MGC cannot detect the switchover to the backup link or the resulting changes in network topology and available bandwidth. The MGC would continue to admit calls at the bandwidth of the primary link, causing network congestion and possible jitter, delay, and loss of calls.

To configure dynamic CAC for a logical interface, include the **dynamic-call-admission-control** statement, with options:

```
dynamic-call-admission-control {  
  activation-priority priority;  
  bearer-bandwidth-limit kilobits-per-second;  
}
```

You can include this statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]

bearer-bandwidth-limit *kilobits-per-second* is the dynamic CAC bearer bandwidth limit (BBL)—the maximum bandwidth available for voice traffic on the interface. The TGM550 reports the BBL to the MGC. When the call bandwidth exceeds the BBL, the MGC blocks new calls and alerts the user with a busy tone. The BBL range is from 0 through 9999. The default BBL is -1, which indicates that dynamic CAC is not configured on an interface.

activation-priority *priority* specifies the order in which interfaces are used for providing call bandwidth. The interface with the highest activation priority value is used as the primary link for providing call bandwidth. If the primary link becomes unavailable, the TGM550 switches to the next active interface with the highest activation priority value, and so on. The activation priority value range is from 0 through 255. The default is 50.



NOTE: Dynamic CAC works in conjunction with the Avaya Communication Manager (CM) Call Admission Control: Bandwidth Limitation (CAC-BL) feature. If you configure dynamic CAC on WAN interfaces, you must also configure CAC-BL on Avaya CM. For more information about configuring CAC-BL, see the *Administrator Guide for Avaya Communication Manager*.

Example: Configuring Dynamic CAC

Configure dynamic CAC on a logical interface:

```
[edit]
interfaces {
  t1-4/0/0 {
    unit 0 {
      dynamic-call-admission-control {
        bearer-bandwidth-limit 900 kbps;
        activation-priority 75;
      }
    }
  }
}
```

Disabling a Logical Interface

You can unconfigure a logical interface, effectively disabling that interface, without removing the logical interface configuration statements from the configuration. To do this, include the **disable** statement:

disable;

You can include this statement at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]

When an interface is disabled, a route (pointing to the reserved target “**REJECT**”) with the IP address of the interface and a 32-bit subnet mask is installed in the routing table. See *Routing Protocols*.

CHAPTER 3

Network Interfaces Configuration Statements and Hierarchy

- [edit interfaces] Hierarchy Level on page 33
- [edit logical-systems] Hierarchy Level on page 50
- [edit protocols connections] Hierarchy Level on page 54
- [edit protocols dot1x] Hierarchy Level on page 55
- [edit protocols iccp] Hierarchy Level on page 55
- [edit protocols lacp] Hierarchy Level on page 55
- [edit protocols oam] Hierarchy Level on page 56
- [edit protocols ppp] Hierarchy Level on page 58
- [edit protocols pppoe] Hierarchy Level on page 58
- [edit protocols protection-group] Hierarchy Level on page 59
- [edit protocols vrrp] Hierarchy Level on page 60
- [edit system processes] Hierarchy Level on page 60

[edit interfaces] Hierarchy Level

The statements at the [edit interfaces *interface-name* unit *logical-unit-number*] hierarchy level can also be configured at the [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*] hierarchy level.



NOTE: The **accounting-profile** statement is an exception to this rule. The **accounting-profile** statement can be configured at the [edit interfaces *interface-name* unit *logical-unit-number*] hierarchy level, but it cannot be configured at the [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*] hierarchy level.

```
interfaces {
  traceoptions {
    file filename <files number> <match regular-expression> <size size> <world-readable |
      no-world-readable> ;
    flag flag <disable>;
```

```
}
interface-name {
  account-layer2-overhead (Interface Level) {
    value;
    egress bytes;
    ingress bytes;
  }
  accounting-profile name;
  aggregated-ether-options {
    (flow-control | no-flow-control);
    lacp {
      (active | passive);
      link-protection {
        disable;
      }
      (revertive | non-revertive);
      periodic interval;
      system-priority priority;
    }
    link-protection;
    link-speed speed;
    (loopback | no-loopback);
    mc-ae {
      chassis-id chassis-id;
      mc-ae-id mc-ae-id;
      mode (active-active | active-standby);
      redundancy-group group-id;
      status-control (active | standby);
    }
    minimum-links number;
    source-address-filter {
      mac-address;
    }
    (source-filtering | no-source-filtering);
  }
  shared-scheduler;
  aggregated-sonet-options {
    link-speed speed | mixed;
    minimum-links number;
  }
  atm-options {
    cell-bundle-size cells;
    ilmi;
    linear-red-profiles profile-name {
      high-plp-max-threshold percent;
      low-plp-max-threshold percent;
      queue-depth cells high-plp-threshold percent low-plp-threshold percent;
    }
    mpls {
      pop-all-labels {
        required-depth number;
      }
    }
  }
  pic-type (atm1 | atm2);
  plp-to-clp;
  promiscuous-mode {
    vpi vpi-identifier;
```

```

}
scheduler-maps map-name {
  forwarding-class class-name {
    epd-threshold cells plp1 cells;
    linear-red-profile profile-name;
    priority (high | low);
    transmit-weight (cells number | percent number);
  }
  vc-cos-mode (alternate | strict);
}
use-null-cw;
vpi vpi-identifier {
  maximum-vcs maximum-vcs;
  oam-liveness {
    down-count cells;
    up-count cells;
  }
  oam-period (seconds | disable);
  shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained rate
    burst length);
    queue-length number;
  }
}
}
clocking clock-source;
data-input (system | interface interface-name);
dce;
serial-options {
  clock-rate rate;
  clocking-mode (dce | internal | loop);
  control-polarity (negative | positive);
  cts-polarity (negative | positive);
  dcd-polarity (negative | positive);
  dce-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
  }
  dsr-polarity (negative | positive);
  dte-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
  }
}

```

```
}
dtr-circuit (balanced | unbalanced);
dtr-polarity (negative | positive);
encoding (nrz | nrzi);
indication-polarity (negative | positive);
line-protocol protocol;
loopback mode;
rts-polarity (negative | positive);
tm-polarity (negative | positive);
transmit-clock invert;
}
description text;
dialer-options {
    pool pool-name <priority priority>;
}
disable;
ds0-options {
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    byte-encoding (nx56 | nx64);
    fcs (16 | 32);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback payload;
    start-end-flag (filler | shared);
}
e1-options {
    bert-error-rate rate;
    bert-period seconds;
    fcs (16 | 32);
    framing (g704 | g704-no-crc4 | unframed);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback (local | remote);
    start-end-flag (filler | shared);
    timeslots time-slot-range;
}
e3-options {
    atm-encapsulation (direct | plcp);
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    framing feet;
    compatibility-mode (digital-link | kentrox | larscom) <subrate value>;
    fcs (16 | 32);
    framing (g.751 | g.832);
    idle-cycle-flag (filler | shared);
    invert-data;
    loopback (local | remote);
    (payload-scrambler | no-payload-scrambler);
    start-end-flag (filler | shared);
    (unframed | no-unframed);
}
encapsulation type;
es-options {
```

```

    backup-interface es-fpc/pic/port;
  }
  fastether-options {
    802.3ad aex;
    (flow-control | no-flow-control);
    ignore-l3-incompletes;
    ingress-rate-limit rate;
    (loopback | no-loopback);
    mpls {
      pop-all-labels {
        required-depth number;
      }
    }
    source-address-filter {
      mac-address;
    }
    (source-filtering | no-source-filtering);
  }
  flexible-vlan-tagging;
  gigether-options {
    802.3ad aex;
    (asynchronous-notification | no-asynchronous-notification);
    (auto-negotiation | no-auto-negotiation) remote-fault <local-interface-online |
      local-interface-offline>;
    auto-reconnect seconds;
    (flow-control | no-flow-control);
    ignore-l3-incompletes;
    (loopback | no-loopback);
    mpls {
      pop-all-labels {
        required-depth number;
      }
    }
    no-auto-mdix;
    source-address-filter {
      mac-address;
    }
    (source-filtering | no-source-filtering);
    ethernet-switch-profile {
      (mac-learn-enable | no-mac-learn-enable);
      tag-protocol-id [ tpids ];
      ethernet-policer-profile {
        input-priority-map {
          ieee802.1p premium [ values ];
        }
        output-priority-map {
          classifier {
            premium {
              forwarding-class class-name {
                loss-priority (high | low);
              }
            }
          }
        }
      }
    }
    policer cos-policer-name {
      aggregate {

```

```
        bandwidth-limit bps;  
        burst-size-limit bytes;  
    }  
    premium {  
        bandwidth-limit bps;  
        burst-size-limit bytes;  
    }  
} }  
}  
(gratuitous-arp-reply | no-gratuitous-arp-reply);  
hold-time up milliseconds down milliseconds;  
ima-group-options {  
    differential-delay number;  
    frame-length (32 | 64 | 128 | 256);  
    frame-synchronization {  
        alpha number;  
        beta number;  
        gamma number;  
    }  
    minimum-links number;  
    symmetry (symmetrical-config-and-operation |  
        symmetrical-config-asymmetrical-operation);  
    test-procedure {  
        ima-test-start;  
        ima-test-stop;  
        interface name;  
        pattern number;  
        period number;  
    }  
    transmit-clock (common | independent);  
    version (1.0 | 1.1);  
}  
ima-link-options group-id group-id;  
interface-set interface-set-name {  
    interface ethernet-interface-name {  
        (unit unit-number | vlan-tags-outer vlan-tag);  
    }  
    interface interface-name {  
        (unit unit-number);  
    }  
}  
isdn-options {  
    bchannel-allocation (ascending | descending);  
    calling-number number;  
    pool pool-name <priority priority>;  
    spid1 spid-string;  
    spid2 spid-string;  
    static-tei-val value;  
    switch-type (att5e | etsi | ni1 | ntdms100 | ntt);  
    t310 seconds;  
    tei-option (first-call | power-up);  
}  
keepalives <down-count number> <interval seconds> <up-count number>;  
link-mode mode;
```

```

lmi {
    lmi-type (ansi | itu | c-lmi);
    n391dte number;
    n392dce number;
    n392dte number;
    n393dce number;
    n393dte number;
    t391dte seconds;
    t392dce seconds;
}
lsq-failure-options {
    no-termination-request;
    [ trigger-link-failure interface-name ];
}
mac mac-address;
mlfr-uni-nni-bundle-options {
    acknowledge-retries number;
    acknowledge-timer milliseconds;
    action-red-differential-delay (disable-tx | remove-link);
    drop-timeout milliseconds;
    fragment-threshold bytes;
    cisco-interoperability send-lip-remove-link-for-link-reject;
    hello-timer milliseconds;
    link-layer-overhead percent;
    lmi-type (ansi | itu | c-lmi);
    minimum-links number;
    mrru bytes;
    n391 number;
    n392 number;
    n393 number;
    red-differential-delay milliseconds;
    t391 seconds;
    t392 seconds;
    yellow-differential-delay milliseconds;
}
modem-options {
    dialin (console | routable);
    init-command-string initialization-command-string;
}
mtu bytes;
multi-chassis-protection {
    peer a.b.c.d {
        interface interface-name;
    }
}
multiservice-options {
    (core-dump | no-core-dump);
    (syslog | no-syslog);
}
native-vlan-id number;
no-gratuitous-arp-request;
no-keepalives;
no-partition {
    interface-type type;
}
no-vpivci-swapping;

```

```
optics-options {
  alarm low-light-alarm {
    (link-down | syslog);
  }
  tx-power dbm;
  warning low-light-warning {
    (link-down | syslog);
  }
  wavelength nm;
}
otn-options {
  bytes transmit-payload-type value;
  fec (efec | gfec | gfec-sdfec | none);
  (is-ma | no-is-ma);
  (laser-enable | no-laser-enable);
  (line-loopback | no-line-loopback);
  (local-loopback | no-local-loopback);
  (odu-ttim-action-enable | no-odu-ttim-action-enable);
  (otu-ttim-action-enable | no-otu-ttim-action-enable);
  odu-delay-management {
    (bypass | no-bypass);
    (monitor-end-point | no-monitor-end-point);
    (number-of-frames | no-number-of-frames);
    (start-measurement | no-start-measurement);
  }
  (prbs | no-prbs);
  preemptive-fast-reroute {
    (backward-frr-enable | no-backward-frr-enable);
    (signal-degrade-monitor-enable | no-signal-degrade-monitor-enable);
  }
  rate {
    (fixed-stuff-bytes | no-fixed-stuff-bytes);
    otu4;
    (pass-through | no-pass-through);
  }
  signal-degrade {
    ber-threshold-clear value;
    ber-threshold-signal-degrade value;
    interval value;
  }
  trigger trigger-identifier;
  tti tti-identifier;
}
partition partition-number oc-slice oc-slice-range interface-type type;
timeslots time-slot-range;
passive-monitor-mode;
per-unit-scheduler;
ppp-options {
  chap {
    access-profile name;
    default-chap-secret name;
    local-name name;
    passive;
  }
  compression {
    acfc;
  }
}
```



```

    pfc;
  }
  dynamic-profile profile-name;
  no-termination-request;
  pap {
    access-profile name;
    local-name name;
    local-password password;
    compression;
  }
}
psn-vcip psn-vci-identifier;
psn-vpip psn-vpi-identifier;
receive-bucket {
  overflow (discard | tag);
  rate percentage;
  threshold bytes;
}
redundancy-options {
  priority sp-fpc/pic/port;
  secondary sp-fpc/pic/port;
  hot-standby;
}
satop-options {
  payload-size n;
}
schedulers number;
serial-options {
  clock-rate rate;
  clocking-mode (dce | internal | loop);
  control-polarity (negative | positive);
  cts-polarity (negative | positive);
  dcd-polarity (negative | positive);
  dce-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
  }
  dsr-polarity (negative | positive);
  dte-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
  }
}

```

```
dtr-circuit (balanced | unbalanced);
dtr-polarity (negative | positive);
encoding (nrz | nrzi);
indication-polarity (negative | positive);
line-protocol protocol;
loopback mode;
rts-polarity (negative | positive);
tm-polarity (negative | positive);
transmit-clock invert;
}
services-options {
  inactivity-timeout seconds;
  open-timeout seconds;
  session-limit {
    maximum number;
    rate new-sessions-per-second;
  }
  syslog {
    host hostname {
      facility-override facility-name;
      log-prefix prefix-number;
      services priority-level;
    }
  }
}
shdsl-options {
  annex (annex-a | annex-b);
  line-rate line-rate;
  loopback (local | remote);
  snr-margin {
    current margin;
    snext margin;
  }
}
sonet-options {
  aggregate asx;
  aps {
    advertise-interval milliseconds;
    annex-b;
    authentication-key key;
    fast-aps-switch;
    force;
    hold-time milliseconds;
    lockout;
    neighbor address;
    paired-group group-name;
    preserve-interface;
    protect-circuit group-name;
    request;
    revert-time seconds;
    switching-mode (bidirectional | unidirectional);
    working-circuit group-name;
  }
  bytes {
    c2 value;
    e1-quiet value;
```

```

    f1 value;
    f2 value;
    s1 value;
    z3 value;
    z4 value;
}
fcs (16 | 32);
loopback (local | remote);
mpls {
    pop-all-labels {
        required-depth number;
    }
}
path-trace trace-string;
(payload-scrambler | no-payload-scrambler);
rfc-2615;
trigger {
    defect ignore;
    hold-time up milliseconds down milliseconds;
}
vtmapping (itu-t | klm);
(z0-increment | no-z0-increment);
}
speed (10m | 100m | 1g | oc3 | oc12 | oc48);
stacked-vlan-tagging;
switch-options {
    switch-port port-number {
        (auto-negotiation | no-auto-negotiation);
        speed (10m | 100m | 1g);
        link-mode (full-duplex | half-duplex);
    }
}
t1-options {
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    buildout value;
    byte-encoding (nx56 | nx64);
    crc-major-alarm-threshold (1e-3 | 5e-4 | 1e-4 | 5e-5 | 1e-5);
    crc-minor-alarm-threshold (1e-3 | 5e-4 | 1e-4 | 5e-5 | 1e-5 | 5e-6 | 1e-6);
    fcs (16 | 32);
    framing (esf | sf);
    idle-cycle-flag (flags | ones);
    invert-data;
    line-encoding (ami | b8zs);
    loopback (local | payload | remote);
    remote-loopback-respond;
    start-end-flag (filler | shared);
    timeslots time-slot-range;
}
t3-options {
    atm-encapsulation (direct | plcp);
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    buildout feet;

```

```
(cbit-parity | no-cbit-parity);
compatibility-mode (adtran | digital-link | kentrox | larscom | verilink) <subrate
    value>;
fcs (16 | 32);
(feac-loop-respond | no-feac-loop-respond);
idle-cycle-flag value;
(long-buildout | no-long-buildout);
(loop-timing | no-loop-timing);
loopback (local | payload | remote);
(mac | no-mac);
(payload-scrambler | no-payload-scrambler);
start-end-flag (filler | shared);
}
traceoptions {
    flag flag <flag-modifier> <disable>;
}
transmit-bucket {
    overflow discard;
    rate percentage;
    threshold bytes;
}
(traps | no-traps);
unidirectional;
vlan-tagging;
vlan-vci-tagging;
unit logical-unit-number {
    accept-source-mac {
        mac-address mac-address {
            policer {
                input cos-policer-name;
                output cos-policer-name;
            }
        }
    }
}
account-layer2-overhead {
    value;
    egress bytes;
    ingress bytes;
}
accounting-profile name;
advisory-options {
    downstream-rate rate;
    upstream-rate rate;
}
allow-any-vci;
atm-scheduler-map (map-name | default);
backup-options {
    interface interface-name;
}
bandwidth rate;
cell-bundle-size cells;
clear-dont-fragment-bit;
compression {
    rtp {
        f-max-period number;
        maximum-contexts number <force>;
    }
}
```

```

    queues [ queue-numbers ];
    port {
        minimum port-number;
        maximum port-number;
    }
}
compression-device interface-name;
copy-tos-to-outer-ip-header;
demux-destination family;
demux-source family;
demux-options {
    underlying-interface interface-name;
}
description text;
interface {
    l2tp-interface-id name;
    (dedicated | shared);
}
dialer-options {
    activation-delay seconds;
    callback;
    callback-wait-period time;
    deactivation-delay seconds;
    dial-string [ dial-string-numbers ];
    idle-timeout seconds;
    incoming-map {
        caller (caller-id | accept-all);
        initial-route-check seconds;
        load-interval seconds;
        load-threshold percent;
        pool pool-name;
        redial-delay time;
        watch-list {
            [ routes ];
        }
    }
}
disable;
disable-mlppp-inner-ppp-pfc;
dlci dlci-identifier;
drop-timeout milliseconds;
dynamic-call-admission-control {
    activation-priority priority;
    bearer-bandwidth-limit kilobits-per-second;
}
encapsulation type;
epd-threshold cells plp1 cells;
fragment-threshold bytes;
inner-vlan-id-range start start-id end end-id;
input-vlan-map {
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    inner-tag-protocol-id tpid;
    inner-vlan-id number;
    tag-protocol-id tpid;
    vlan-id number;
}

```

```
}
interleave-fragments;
inverse-arp;
layer2-policer {
    input-policer policer-name;
    input-three-color policer-name;
    output-policer policer-name;
    output-three-color policer-name;
}
link-layer-overhead percent;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
    down-count cells;
    up-count cells;
}
oam-period (seconds | disable);
output-vlan-map {
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    inner-tag-protocol-id tpid;
    inner-vlan-id number;
    tag-protocol-id tpid;
    vlan-id number;
}
passive-monitor-mode;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
    chap {
        access-profile name;
        default-chap-secret name;
        local-name name;
        passive;
    }
    compression {
        acfc;
        pfc;
        pap;
        default-pap-password password;
        local-name name;
        local-password password;
        passive;
    }
    dynamic-profile profile-name;
    lcp-max-conf-req number;
    lcp-restart-timer milliseconds;
    loopback-clear-timer seconds;
    ncp-max-conf-req number;
    ncp-restart-timer milliseconds;
}
pppoe-options {
```

```

    access-concentrator name;
    auto-reconnect seconds;
    (client | server);
    service-name name;
    underlying-interface interface-name;
}
proxy-arp;
service-domain (inside | outside);
shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained rate
    burst length);
    queue-length number;
}
short-sequence;
transmit-weight number;
(traps | no-traps);
trunk-bandwidth rate;
trunk-id number;
tunnel {
    backup-destination address;
    destination address;
    key number;
    routing-instance {
        destination routing-instance-name;
    }
    source source-address;
    ttl number;
}
vci vpi-identifier.vci-identifier;
vci-range start start-vci end end-vci;
vpi vpi-identifier;
vlan-id number;
vlan-id-list [vlan-id vlan-id-vlan-id];
vlan-id-range number-number;
vlan-tags inner tpid.vlan-id outer tpid.vlan-id;
vlan-tags-outer tpid.vlan-id inner-list [vlan-id vlan-id-vlan-id];
family family {
    accounting {
        destination-class-usage;
        source-class-usage {
            direction;
        }
    }
}
access-concentrator name;
address address {
    destination address;
}
bundle ml-fpc/pic/port | ls-fpc/pic/port);
duplicate-protection;
dynamic-profile profile-name;
filter {
    group filter-group-number;
    input filter-name;
    input-list {
        [ filter-names ];
    }
    output filter-name;
}

```

```
    }
    output-list {
        [ filter-names ];
    }
}
ipsec-sa sa-name;
keep-address-and-control;
max-sessions number;
max-sessions-vs-a-ignore;
mtu bytes;
multicast-only;
negotiate-address;
no-redirects;
policer {
    arp policer-template-name;
    input policer-template-name;
    output policer-template-name;
}
primary;
proxy inet-address address;
receive-options-packets;
receive-ttl-exceeded;
remote (inet-address address | mac-address address);
rpf-check {
    fail-filter filter-name;
    mode loose;
}
sampling {
    direction;
}
service {
    input {
        service-set service-set-name <service-filter filter-name>;
        post-service-filter filter-name;
    }
    output {
        service-set service-set-names <service-filter filter-name>;
    }
}
service-name-table table-name;
short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
    maximum-seconds>;
targeted-broadcast {
    forward-and-send-to-re;
    forward-only;
}
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
translate-plp-control-word-de;
unnumbered-address interface-name <destination address destination-profile
    profile-name | preferred-source-address address>;
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast address;
    destination address;
    destination-profile name;
```



```

eui-64;
multipoint-destination address (dlci dlci-identifier | vci vci-identifier);
multipoint-destination address {
  epd-threshold cells plp1 cells;
  inverse-arp;
  oam-liveness {
    up-count cells;
    down-count cells;
  }
  oam-period (seconds | disable);
  shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained
      rate burst length);
    queue-length number;
  }
  vci vpi-identifier.vci-identifier;
}
preferred;
primary;
(vrrp-group | vrrp-inet6-group) group-number {
  (accept-data | no-accept-data);
  advertise-interval seconds;
  authentication-type authentication;
  authentication-key key;
  fast-interval milliseconds;
  (preempt | no-preempt) {
    hold-time seconds;
  }
  priority-number number;
  track {
    priority-cost seconds;
    priority-hold-time interface-name {
      bandwidth-threshold bits-per-second {
        priority;
      }
      interface priority;
    }
    route ip-address/mask routing-instance instance-name priority-cost cost;
  }
  virtual-address [ addresses ];
}
}
}
}
}
}
}

```

Related Documentation

- [Junos OS Hierarchy and RFC Reference](#)
- [Ethernet Interfaces](#)
- [Junos OS Network Interfaces Library for Routing Devices](#)

[edit logical-systems] Hierarchy Level

The following lists the statements that can be configured at the **[edit logical-systems]** hierarchy level that are also documented in this manual. For more information about logical systems, see the *Logical Systems Feature Guide for Routing Devices*.

```
logical-systems logical-system-name {  
  interfaces interface-name {  
    unit logical-unit-number {  
      accept-source-mac {  
        mac-address mac-address {  
          policer {  
            input cos-policer-name;  
            output cos-policer-name;  
          }  
        }  
      }  
    }  
    allow-any-vci;  
    atm-scheduler-map (map-name | default);  
    bandwidth rate;  
    backup-options {  
      interface interface-name;  
    }  
    cell-bundle-size cells;  
    clear-dont-fragment-bit;  
    compression {  
      rtp {  
        f-max-period number;  
        port {  
          minimum port-number;  
          maximum port-number;  
        }  
      }  
      queues [ queue-numbers ];  
    }  
  }  
  compression-device interface-name;  
  description text;  
  interface {  
    l2tp-interface-id name;  
    (dedicated | shared);  
  }  
  dialer-options {  
    activation-delay seconds;  
    deactivation-delay seconds;  
    dial-string [ dial-string-numbers ];  
    idle-timeout seconds;  
    initial-route-check seconds;  
    load-threshold number;  
    pool pool;  
    remote-name remote-callers;  
    watch-list {  
      [ routes ];  
    }  
  }  
}
```

```

disable;
dlci dlci-identifier;
drop-timeout milliseconds;
dynamic-call-admission-control {
    activation-priority priority;
    bearer-bandwidth-limit kilobits-per-second;
}
encapsulation type;
epd-threshold cells plp1 cells;
fragment-threshold bytes;
input-vlan-map {
    inner-tag-protocol-id;
    inner-vlan-id;
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    tag-protocol-id tpid;
    vlan-id number;
}
interleave-fragments;
inverse-arp;
layer2-policer {
    input-policer policer-name;
    input-three-color policer-name;
    output-policer policer-name;
    output-three-color policer-name;
}
link-layer-overhead percent;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
    up-count cells;
    down-count cells;
}
oam-period (seconds | disable);
output-vlan-map {
    inner-tag-protocol-id;
    inner-vlan-id;
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-swap);
    tag-protocol-id tpid;
    vlan-id number;
}
passive-monitor-mode;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
    chap {
        access-profile name;
        default-chap-secret name;
        local-name name;
        passive;
    }
    compression {

```

```
    acfc;
    pfc;
  }
}
dynamic-profile profile-name;
pap {
  default-pap-password password;
  local-name name;
  local-password password;
  passive;
}
}
proxy-arp;
service-domain (inside | outside);
shaping {
  (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained rate burst length);
  queue-length number;
}
short-sequence;
transmit-weight number;
(traps | no-traps);
trunk-bandwidth rate;
trunk-id number;
tunnel {
  backup-destination address;
  destination address;
  key number;
  routing-instance {
    destination routing-instance-name;
  }
  source source-address;
  ttl number;
}
vci vpi-identifier.vci-identifier;
vlan-id number;
vlan-id-list [vlan-id vlan-id–vlan-id]
vlan-tags inner tpid.vlan-id outer tpid.vlan-id;
vlan-tags outer tpid.vlan-id inner-list [vlan-id vlan-id–vlan-id]
vpi vpi-identifier;
family family {
  accounting {
    destination-class-usage;
    source-class-usage {
      direction;
    }
  }
}
bundle interface-name;
filter {
  group filter-group-number;
  input filter-name;
  input-list {
    [filter-names ];
  }
  output filter-name;
  output-list {
```

```

    [ filter-names ];
  }
}
ipsec-sa sa-name;
keep-address-and-control;
mtu bytes;
multicast-only;
no-redirects;
policer {
  arp policer-template-name;
  input policer-template-name;
  output policer-template-name;
}
primary;
proxy inet-address address;
receive-options-packets;
receive-ttl-exceeded;
remote (inet-address address | mac-address address);
rpf-check <fail-filter filter-name> {
  <mode loose>;
}
sampling {
  direction;
}
service {
  input {
    service-set service-set-name <service-filter filter-name>;
    post-service-filter filter-name;
  }
  output {
    service-set service-set-name <service-filter filter-name>;
  }
}
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
unnumbered-address interface-name destination address destination-profile
  profile-name;
address address {
  arp ip-address (mac | multicast-mac) mac-address <publish>;
  broadcast address;
  destination address;
  destination-profile name;
  eui-64;
  multipoint-destination address (dlci dlci-identifier | vci vci-identifier);
  multipoint-destination address {
    epd-threshold cells plp1 cells;
    inverse-arp;
    oam-liveness {
      up-count cells;
      down-count cells;
    }
    oam-period (seconds | disable);
    shaping {
      (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained
        rate burst length);
      queue-length number;
    }
  }
}

```

```
    }
    vci vpi-identifier.vci-identifier;
  }
  preferred;
  primary;
  (vrrp-group | vrrp-inet6-group) group-number {
    (accept-data | no-accept-data);
    advertise-interval seconds;
    authentication-type authentication;
    authentication-key key;
    fast-interval milliseconds;
    (preempt | no-preempt) {
      hold-time seconds;
    }
    priority-number number;
    track {
      priority-cost seconds;
      priority-hold-time interface-name {
        interface priority;
        bandwidth-threshold bits-per-second {
          priority;
        }
      }
    }
    route ip-address/mask routing-instance instance-name priority-cost cost;
  }
}
virtual-address [ addresses ];
}
}
}
}
```

**Related
Documentation**

- [Junos OS Hierarchy and RFC Reference](#)
- [Ethernet Interfaces](#)
- [Junos OS Network Interfaces Library for Routing Devices](#)

[\[edit protocols connections\] Hierarchy Level](#)

The following statements can also be configured at the **[edit logical-systems logical-system-name protocols connections]** hierarchy level.

```
interface-switch connection-name {
  interface interface-name.unit-number;
  interface interface-name.unit-number;
}
```

- Related Documentation**
- *Junos OS Hierarchy and RFC Reference*
 - *Ethernet Interfaces*
 - *Junos OS Network Interfaces Library for Routing Devices*

[edit protocols dot1x] Hierarchy Level

```
dot1x {
  authenticator
    authentication-profile-name access-profile-name;
    interface interface-ids {
      maximum-requests integer;
      retries integer;
      quiet-period seconds;
      transmit-period seconds;
      reauthentication (disable | interval seconds);
      server-timeout seconds;
      supplicant (single);
      supplicant-timeout seconds;
    }
  }
}
```

- Related Documentation**
- *Junos OS Hierarchy and RFC Reference*
 - *Ethernet Interfaces*
 - *Junos OS Network Interfaces Library for Routing Devices*

[edit protocols iccp] Hierarchy Level

```
iccp {
  traceoptions;
  local-ip-address ip address;
  session-establishment-hold-time value;
  authentication-key string;
  peer ip-address {
    local-ip-address ip address;
    session-establishment-hold-time value;
    authentication-key string;
    redundancy-group-id-list redundancy-group-id-list;
    liveness-detection;
  }
}
```

- Related Documentation**
- *traceoptions*
 - *Configuring ICCP for MC-LAG*

[edit protocols lacp] Hierarchy Level

```
traceoptions {
```

```
file filename <files number> <size size> <world-readable | no-world-readable>;
flag flag <disable>;
}
```

**Related
Documentation**

- *Junos OS Hierarchy and RFC Reference*
- *Ethernet Interfaces*
- *Junos OS Network Interfaces Library for Routing Devices*

[[edit protocols oam](#)] Hierarchy Level

```
ethernet {
  connectivity-fault-management {
    action-profile profile-name {
      default-actions {
        interface-down;
      }
      event {
        adjacency-loss;
        interface-status-tlv (down | lower-layer-down);
        port-status-tlv blocked;
        rdi;
      }
    }
  }
  linktrace {
    age (30m | 10m | 1m | 30s | 10s);
    path-database-size path-database-size;
  }
  maintenance-domain domain-name {
    bridge-domain name;
    routing-instance rl {
      bridge-domain name;
      instance vpls-instance;
      interface (ge | xe) fpc/pic/port.domain;
      level number;
      maintenance-association name{
        mep identifier {
          direction (up | down)
          interface (ge | xe) fpc/pic/port.domain (working | protect );
          auto-discovery;
          lowest-priority-defect (all-defects | err-xcon | mac-rem-err-xcon | no-defect |
            rem-err-xcon | xcon);
          priority number;
        }
      }
    }
    mip-half-function (none | default | explicit);
    name-format (character-string | none | dns | mac+2oct);
    short-name-format (character-string | vlan | 2octet | rfc-2685-vpn-id);
    protect-maintenance-association protect-ma-name;
    remote-maintenance-association remote-ma-name;
    continuity-check {
      hold-interval minutes;
      interval (10m | 10s | 1m | 1s | 100ms);
      loss-threshold number;
    }
  }
}
```



```

    }
    maintenance-association ma-name {
        mip-half-function (none | default | explicit);
        mep mep-id {
            auto-discovery;
            direction (up | down);
            interface interface-name (working | protect);
            priority number;
            remote-mep mep-id {
                action-profile profile-name;
                sla-iterator-profile profile-name {
                    data-tlv-size bytes;
                    iteration-count frames;
                    priority priority-value;
                }
            }
        }
    }
}
performance-monitoring {
    hardware-assisted-timestamping;
    sla-iterator-profiles {
        profile-name {
            disable;
            calculation-weight {
                delay delay-weight;
                delay-variation delay-variation-weight;
            }
            cycle-time milliseconds;
            iteration-period connections;
            measurement-type (loss | statistical-frame-loss | two-way-delay);
        }
    }
}
link-fault-management {
    action-profile profile-name {
        action {
            syslog;
            link-down;
            send-critical-event;
        }
        event {
            link-adjacency-loss;
            link-event-rate {
                frame-error count;
                frame-period count;
                frame-period-summary count;
                symbol-period count;
            }
            protocol-down;
        }
    }
}
interface interface-name {
    apply-action-profile profile-name;
    event-thresholds {

```

```
    frame-error count;  
    frame-period count;  
    frame-period-summary count;  
    symbol-period count;  
  }  
  link-discovery (active | passive);  
  negotiation-options {  
    allow-remote-loopback;  
    no-allow-link-events;  
  }  
  pdu-interval interval;  
  pdu-threshold threshold-value;  
  remote-loopback;  
}  
}  
fnp {  
  interval <100ms | 1s | 10s | 1m | 10m>;  
  loss-threshold number  
  interface interface name {  
    domain-id domain-id  
  }  
}  
}
```

- Related Documentation**
- *Junos OS Hierarchy and RFC Reference*
 - *Ethernet Interfaces*
 - *Junos OS Network Interfaces Library for Routing Devices*

[\[edit protocols ppp\] Hierarchy Level](#)

```
monitor-session (interface-name | all);  
tracoptions {  
  file filename <files number> <match regular-expression> <size size> <world-readable |  
    no-world-readable> ;  
  flag flag <disable>;  
}
```

- Related Documentation**
- *Junos OS Hierarchy and RFC Reference*
 - *Ethernet Interfaces*
 - *Junos OS Network Interfaces Library for Routing Devices*

[\[edit protocols pppoe\] Hierarchy Level](#)

```
pppoe {  
  no-send-pads-error;  
  no-send-pads-ac-info  
  pado-advertise;  
  service-name-tables table-name {  
    service service-name {  
      drop;  
    }  
  }  
}
```


[edit protocols vrrp] Hierarchy Level

The following statement hierarchy can also be included at the [edit logical-systems *logical-system-name*] hierarchy level.

```
protocols {
  vrrp {
    asymmetric-hold-time;
    delegate-processing;
    failover-delay milliseconds;
    global-advertisements-threshold advertisement-value;
    skew-timer-disable;
    startup-silent-period seconds;
    traceoptions {
      file <filename> <files number> <match regular-expression> <microsecond-stamp>
        <size maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
    version-3;
  }
}
```

Related Documentation

- *Notational Conventions Used in Junos OS Configuration Hierarchies*
- *[edit protocols] Hierarchy Level*
- *Junos OS Hierarchy and RFC Reference*
- *Ethernet Interfaces*
- *Junos OS Network Interfaces Library for Routing Devices*

[edit system processes] Hierarchy Level

```
dialer-services {
  disable;
}
isdn-signaling {
  disable;
  reject-incoming;
}
```


Related Documentation

- *ISDN Configuration Overview*
- *Disabling ISDN Processes*


CHAPTER 4

Statement Summary

accept-source-mac

Syntax	<pre>accept-source-mac { mac-address mac-address { policer { input cos-policer-name; output cos-policer-name; } } }</pre>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.1X48 for PTX Packet Transport Routers.</p>
Description	<p>For Gigabit Ethernet intelligent queuing (IQ) interfaces only, accept traffic from and to the specified remote media access control (MAC) address.</p> <p>The accept-source-mac statement is equivalent to the source-address-filter statement, which is valid for aggregated Ethernet, Fast Ethernet, and Gigabit Ethernet interfaces only.</p> <p>On untagged Gigabit Ethernet interfaces, you should not configure the source-address-filter statement and the accept-source-mac statement simultaneously. On tagged Gigabit Ethernet interfaces, you should not configure the source-address-filter statement and the accept-source-mac statement with an identical MAC address specified in both filters.</p> <p>The statements are explained separately.</p>
	<div>  <p>NOTE: The policer statement is not supported on PTX Series Packet Transport Routers.</p> </div>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring MAC Address Filtering Configuring MAC Filtering on PTX Series Packet Transport Routers source-filtering

access-concentrator

Syntax	<code>access-concentrator <i>name</i>;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-options],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Support at the [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options] and [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options] hierarchy levels introduced in Junos OS Release 10.1.</p> <p>Support at the [edit ... family pppoe] hierarchies introduced in Junos OS Release 11.2.</p>
Description	<p>(J Series Services Routers with Point-to-Point Protocol over Ethernet (PPPoE) interfaces) Configure the name of the access concentrator. If you configure a specific access concentrator name on the client and the same access concentrator name server is available, then a PPPoE session is established. If there is a mismatch between the access concentrator names of the client and the server, the PPPoE session gets closed.</p> <p>If you do not configure the access concentrator name, the PPPoE session starts using any available server in the network.</p> <p>(Intelligent Queuing 2 (IQ2) PICs on M120 and M320 routers; MPCs on MX Series routers) Configure an alternative access concentrator name in the AC-NAME tag in a PPPoE control packet for use with a dynamic PPPoE subscriber interface. If you do not configure the access concentrator name, the AC-NAME tag contains the system name.</p>
	<div>  <p>NOTE: The [edit ... family pppoe] hierarchies are supported only on MX Series routers with MPCs.</p> </div>
Options	<i>name</i> —Name of the access concentrator.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

**Related
Documentation**

- *Identifying the Access Concentrator*
- *Configuring the PPPoE Family for an Underlying Interface*
- *Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles*
- *Junos OS Interfaces and Routing Configuration Guide*

access-profile

Syntax	<code>access-profile name;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> auto-configure vlan-ranges], [edit interfaces <i>interface-name</i> auto-configure stacked-vlan-ranges], [edit interfaces <i>interface-name</i> ppp-options chap], [edit interfaces <i>interface-name</i> ppp-options pap], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options chap], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options pap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options chap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options pap]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4. Support for PAP added in Junos OS Release 8.3. Support for VLAN and stacked VLAN ranges added in Junos OS Release 10.0.</p>
Description	<p>For CHAP authentication, the mapping between peer names (or “clients”) and the secrets associated with their respective links. For PAP authentication, the peer's username and password.</p> <p>For Asynchronous Transfer Mode 2 (ATM2) IQ interfaces only, you can configure a Challenge Handshake Authentication Protocol (CHAP) access profile on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:</p> <ul style="list-style-type: none"> • atm-ppp-llc—PPP over AAL5 logical link control (LLC) encapsulation. • atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation. <p>For VLAN and stacked VLAN authentication, the access profile containing the RADIUS accounting and authentication information for the VLAN or stacked VLAN ranges.</p>
Options	name —Name of the access profile.
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPP Challenge Handshake Authentication Protocol</i> • <i>Configuring the PPP Password Authentication Protocol</i> • default-chap-secret on page 82 • <i>Junos OS Administration Library for Routing Devices</i>

accounting

Syntax	<pre>accounting { destination-class-usage; source-class-usage { direction; } }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Enable IP packet counters on an interface. The statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Enabling Source Class and Destination Class Usage</i>

accounting-profile

Syntax	<pre>accounting-profile <i>name</i>;</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces interface-range <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Enable collection of accounting data for the specified physical or logical interface or interface range.
Options	<i>name</i> —Name of the accounting profile.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Applying an Accounting Profile to the Physical Interface</i>• Applying an Accounting Profile to the Logical Interface on page 22

acfc

Syntax	<code>acfc;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> <code>ppp-options compression</code>], [edit interfaces <i>interface-name</i> <code>unit logical-unit-number ppp-options compression</code>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> <code>unit logical-unit-number ppp-options compression</code>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For interfaces with PPP encapsulation, configure compression of the Data Link Layer address and control fields. The acfc option is not supported with frame-relay-ppp encapsulation.</p> <p>On M320, M120, and T Series routers, address and control field compression (ACFC) is not supported for any ISO family protocols. Do not include the acfc statement at the [edit interfaces <i>interface-name</i> <code>ppp-options compression</code>] hierarchy level when you include the family iso statement at the [edit interfaces <i>interface-name</i> <code>unit logical-unit-number</code>] hierarchy level.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring PPP Address and Control Field Compression</i>

activation-delay

Syntax	<code>activation-delay seconds;</code>
Hierarchy Level	[edit interfaces <i>dl</i> <code>unit logical-unit-number dialer-options</code>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(J Series Services Routers) For ISDN interfaces, configure the ISDN dialer activation delay. Used only for dialer backup and dialer watch cases.
Options	<p>seconds—Interval before the backup interface is activated after the primary interface has gone down.</p> <p>Range: 1 through 4,294,967,295 seconds</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the Dialer Interface</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i>

activation-priority

Syntax	<code>activation-priority <i>priority</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> dynamic-call-admission-control], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> dynamic-call-admission-control]
Release Information	Statement introduced in Junos OS Release 8.2.
Description	(J4350 and J6350 Services Routers supporting voice over IP with the TGM550 media gateway module) For Fast Ethernet and Gigabit Ethernet interfaces, ISDN BRI interfaces, and serial interfaces with PPP or Frame Relay encapsulation, configure the dynamic call admission control (dynamic CAC) activation priority value.
Options	<i>priority</i> —The activation priority in which the interface is used for providing call bandwidth. The interface with the highest activation priority value is used as the primary link for providing call bandwidth. If the primary link becomes unavailable, the TGM550 switches over to the next active interface with the highest activation priority value, and so on. Range: 0 through 255 Default: 50
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Dynamic Call Admission Control on page 30• <i>Junos OS Services Interfaces Library for Routing Devices</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

allow-any-vci

Syntax	<code>allow-any-vci;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit 0], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit 0]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access routers.
Description	Dedicate entire ATM device to ATM cell relay circuit.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring an ATM1 Cell-Relay Circuit</i>

atm-scheduler-map

Syntax	<code>atm-scheduler-map (<i>map-name</i> default);</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Associate a scheduler map with a virtual circuit on a logical interface.
Options	<i>map-name</i> —Name of scheduler map that you define at the [edit interfaces <i>interface-name</i> atm-options scheduler-maps] hierarchy level. default —The default scheduler mapping.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring ATM2 IQ VC Tunnel CoS Components</i> • <i>scheduler-maps</i>

auto-reconnect

Syntax	<code>auto-reconnect <i>seconds</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For J Series Services Routers with PPP over Ethernet interfaces, configure the amount of time to wait before reconnecting after a session has terminated.
Options	<i>seconds</i> —Time to wait before reconnecting after a session has terminated. Range: 0 through 4,294,967,295 seconds Default: 0 (immediately)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPPoE Automatic Reconnect Wait Timer</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i>

backup-destination

Syntax	<code>backup-destination <i>address</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For tunnel interfaces, specify the remote address of the backup tunnel.
Options	<i>address</i> —Address of the remote side of the connection.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>• destination (Tunnels) on page 86

backup-options

Syntax	<code>backup-options { interface <i>interface-name</i>; }</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> <i>unit logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> <i>unit logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure an interface to be used as a backup interface if the primary interface goes down. This is used to support ISDN dial backup operation. The remaining statement is explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring an ISDN Dialer Interface as a Backup Interface</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

bandwidth (Interfaces)

Syntax	<code>bandwidth rate;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure an informational-only bandwidth value for an interface. This statement is valid for all logical interface types except multilink and aggregated interfaces.



NOTE: We recommend that you be careful when setting this value. Any interface bandwidth value that you configure using the **bandwidth** statement affects how the interface cost is calculated for a dynamic routing protocol, such as OSPF. By default, the interface cost for a dynamic routing protocol is calculated using the following formula:

$$\text{cost} = \text{reference-bandwidth} / \text{bandwidth},$$


where bandwidth is the physical interface speed. However, if you specify a value for bandwidth using the **bandwidth** statement, that value is used to calculate the interface cost, rather than the actual physical interface bandwidth.

Options	rate —Peak rate, in bits per second (bps) or cells per second (cps). You can specify a value in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation k (1000), m (1,000,000), or g (1,000,000,000). You can also specify a value in cells per second by entering a decimal number followed by the abbreviation c ; values expressed in cells per second are converted to bits per second by means of the formula 1 cps = 384 bps. Range: Not limited.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Interface Bandwidth on page 23

bearer-bandwidth-limit

Syntax	<code>bearer-bandwidth-limit <i>kilobits-per-second</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> dynamic-call-admission-control], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> dynamic-call-admission-control]
Release Information	Statement introduced in Junos OS Release 8.2.
Description	(J4350 and J6350 Services Routers supporting voice over IP with the TGM550 media gateway module) For Fast Ethernet and Gigabit Ethernet interfaces, ISDN BRI interfaces, and serial interfaces with PPP or Frame Relay encapsulation, configure the bearer bandwidth limit (BBL). BBL is used for dynamic call admission control (dynamic CAC) to provide enhanced control over WAN bandwidth.
Options	<i>kilobits-per-second</i> —The bearer bandwidth limit to be reported to a TGM550 media gateway module, in kilobits per second (kbps). Range: 0 through 9999 kbps Default: 1 (dynamic CAC is not enabled on the interface)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Dynamic Call Admission Control on page 30• <i>Junos OS Services Interfaces Library for Routing Devices</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

callback

Syntax	callback;
Hierarchy Level	[edit interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options incoming-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options incoming-map]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	On J Series Services Routers with interfaces configured for ISDN, configure the dialer to terminate the incoming call and call back the originator after the callback wait period. The default wait time is 5 seconds. To configure the wait time, include the callback-wait-period statement at the [edit interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.
	<div>  <p>NOTE: The incoming-map statement is mandatory for the router to accept any incoming ISDN calls.</p> </div> <p>If the callback statement is configured, you cannot use the caller caller-id statement at the [edit interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Dial-In and Callback</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i> • callback-wait-period on page 74

callback-wait-period

Syntax	<code>callback-wait-period <i>time</i>;</code>
Hierarchy Level	[edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	<p>On J Series Services Routers with interfaces configured for ISDN with callback, specify the amount of time the dialer waits before calling back the caller. The default wait time is 5 seconds. The wait time is necessary because, when a call is rejected, the switch waits for up to 4 seconds on point-to-multipoint connections to ensure no other device accepts the call before sending the DISCONNECT message to the originator of the call. However, the default time of 5 seconds may not be sufficient for different switches or may not be needed on point-to-point connections.</p> <p>To configure callback mode, include the callback statement at the [edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p> <p>If the callback statement is configured, you cannot use the caller <i>caller-id</i> statement at the [edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p>
Options	<i>time</i> —Time the dialer waits before calling back the caller.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Dial-In and Callback</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

caller

Syntax	<code>caller (caller-id accept-all);</code>
Hierarchy Level	[edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options incoming-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options incoming-map]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	On J Series Services Routers with interfaces configured for ISDN, specify the dialer to accept a specified caller number or accept all incoming calls.
Options	<p>caller-id—Incoming caller number. You can configure multiple caller IDs on a dialer. The caller ID of the incoming call is matched against all caller IDs configured on all dialers. The dialer matching the caller ID is looked at for further processing. Only a precise match is a valid match. For example, the configured caller ID 1-222-333-4444 or 222-333-4444 will match the incoming caller ID 1-222-333-4444.</p> <p>If the incoming caller ID has fewer digits than the number configured, it is not a valid match. Duplicate caller IDs are not allowed on different dialers; however, for example, the numbers 1-408-532-1091, 408-532-1091, and 532-1091 can still be configured on different dialers.</p> <p>Only one B-channel can map to one dialer. If one dialer is already mapped, any other call mapping to the same dialer is rejected (except in the case of a multilink dialer). If no dialer caller is configured on a dialer, that dialer will not accept any calls.</p> <p>accept-all—Any incoming call in an associated interface is accepted.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>ISDN Interfaces Overview</i> <i>Junos OS Interfaces and Routing Configuration Guide</i>


cbr

Syntax	<code>cbr rate;</code>
Hierarchy Level	[edit interfaces at- <i>fpc/pic/port</i> atm-options vpi <i>vpi-identifier</i> shaping], [edit interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping], [edit interfaces at- <i>fpc/pic/ port</i> unit <i>logical-unit-number</i> shaping], [edit logical-systems <i>logical-system-name</i> interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping], [edit logical-systems <i>logical-system-name</i> interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i> shaping]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM encapsulation only, define a constant bit rate bandwidth utilization in the traffic-shaping profile.
Default	Unspecified bit rate (UBR); that is, bandwidth utilization is unlimited.
Options	rate —Peak rate, in bits per second (bps) or cells per second (cps). You can specify a value in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation k (1000), m (1,000,000), or g (1,000,000,000). You can also specify a value in cells per second by entering a decimal number followed by the abbreviation c ; values expressed in cells per second are converted to bits per second by means of the formula 1 cps = 384 bps. For ATM1 and ATM2 OC3 interfaces, the maximum available rate is 100 percent of <i>line-rate</i> , or 135,600,000 bps. For ATM1 OC12 interfaces, the maximum available rate is 50 percent of <i>line-rate</i> , or 271,263,396 bps. For ATM2 IQ interfaces, the maximum available rate is 542,526,792 bps.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Defining the ATM Traffic-Shaping Profile• rtvbr on page 155• shaping on page 158• vbr on page 176

cell-bundle-size

Syntax	<code>cell-bundle-size <i>cells</i>;</code>
Hierarchy Level	[edit interfaces at- <i>fpc/pic/port</i> atm-options], [edit interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM2 IQ interfaces using ATM Layer 2 circuit cell-relay transport mode only, configure the maximum number of ATM cells per frame.
Options	<i>cells</i> —Maximum number of cells. Default: 1 cell Range: 1 through 176 cells
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the Layer 2 Circuit Cell-Relay Cell Maximum</i>

chap

Syntax	<pre> chap { access-profile name; challenge-length minimum <i>minimum-length</i> maximum <i>maximum-length</i>; default-chap-secret name; local-name name; passive; } </pre>
Hierarchy Level	<pre> [edit interfaces <i>interface-name</i> ppp-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options] </pre>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Allow each side of a link to challenge its peer, using a “secret” known only to the authenticator and that peer. The secret is not sent over the link.</p> <p>By default, PPP CHAP is disabled. If CHAP is not explicitly enabled, the interface makes no CHAP challenges and denies all incoming CHAP challenges.</p> <p>For ATM2 IQ interfaces only, you can configure CHAP on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:</p> <ul style="list-style-type: none"> • atm-ppp-llc—PPP over AAL5 LLC encapsulation. • atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation. <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  <p>BEST PRACTICE: On inline service (si) interfaces for L2TP, only the chap statement itself is typically used for subscriber management. We recommend that you leave the subordinate statements at their default values.</p> </div> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPP Challenge Handshake Authentication Protocol</i> • <i>Junos OS Administration Library for Routing Devices</i> • <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

clear-dont-fragment-bit

Syntax	clear-dont-fragment-bit;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Clear the don't-fragment (DF) bit on all IP version 4 (IPv4) packets entering a generic routing encapsulation (GRE) tunnel. If the encapsulated packet's size exceeds the tunnel's maximum transmission unit (MTU), the packet is fragmented before encapsulation. The statement is supported only on MX Series routers and all M Series routers except the M320 router.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

client

Syntax	client;
Hierarchy Level	[edit interfaces pp0 unit <i>logical-unit-number</i> pppoe-options], [edit logical-systems <i>logical-system-name</i> interfaces pp0 unit <i>logical-unit-number</i> pppoe-options]
Release Information	Statement introduced in Junos OS Release 8.5.
Description	On J Series Services Routers, configure the router to operate in the PPPoE client mode.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPPoE Client Mode</i>

compression (Voice Services)

Syntax	<pre>compression { rtp { f-max-period <i>number</i>; queues [<i>queue-numbers</i>]; port { minimum <i>port-number</i>; maximum <i>port-number</i>; } } }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the compression properties for voice services traffic. The remaining statements are described separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

compression (PPP Properties)

Syntax	<pre>compression { acfc; pfc; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> ppp-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For interfaces with PPP encapsulation, set Link Control Protocol (LCP) compression options. The statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring PPP Address and Control Field Compression</i>• <i>Configuring the PPP Protocol Field Compression</i>

copy-tos-to-outer-ip-header

Syntax	<code>copy-tos-to-outer-ip-header;</code>
Hierarchy Level	[edit interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 8.2.
Description	For GRE tunnel interfaces only, enable the inner IP header's TOS bits to be copied to the outer IP packet header.
Default	If you omit this statement, the TOS bits in the outer IP header are set to 0.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Class of Service Library for Routing Devices</i>

deactivation-delay

Syntax	<code>deactivation-delay <i>seconds</i>;</code>
Hierarchy Level	[edit interfaces <i>dlIn</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure the ISDN deactivation delay. Used only for dialer backup and dialer watch cases.
Options	<p>seconds—Interval before the backup interface is deactivated after the primary interface has comes up.</p> <p>Range: 1 through 4,294,967,295 seconds</p> <p>Default: 0 (zero)</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring ISDN Logical Interface Properties</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i>


default-chap-secret

Syntax	<code>default-chap-secret name;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> ppp-options chap], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options chap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options chap]
Release Information	Statement introduced in Junos OS Release 8.0.
Description	<p>Define the default CHAP secret to be used when no matching CHAP access profile exists.</p> <p>For ATM2 IQ interfaces only, you can configure a default CHAP secret on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:</p> <ul style="list-style-type: none">• atm-ppp-llc—PPP over AAL5 LLC encapsulation.• atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation.
Default	If you do not include the default-chap-secret statement in the configuration, and an interface receives a CHAP challenge or response from a peer that is not in the applied access profile, the link is immediately dropped.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a Default CHAP Secret• access-profile on page 65

default-pap-password

Syntax	<code>default-pap-password password;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options pap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options pap]
Release Information	Statement introduced in Junos OS Release 8.3.
Description	For PAP authentication, the default PAP password.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a Default PAP Password on page 28• access-profile on page 65


demux-destination (Underlying Interface)

Syntax	<code>demux-destination <i>family</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 9.0. Support for aggregated Ethernet added in Junos OS Release 9.4.
Description	Configure the logical demultiplexing (demux) destination family type on the IP demux underlying interface.
	<div>  <p>NOTE: The IP demux interface feature currently supports only Fast Ethernet, Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet underlying interfaces.</p> </div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring an IP Demux Underlying Interface</i>

demux-options (Static Interface)

Syntax	<code>demux-options { <i>underlying-interface</i> <i>interface-name</i> }</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure logical demultiplexing (demux) interface options. The statement is explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Specifying the Demux Underlying Interface</i>

demux-source (Underlying Interface)

Syntax	demux-source <i>family</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],
Release Information	Statement introduced in Junos OS Release 9.0. Support for aggregated Ethernet added in Junos OS Release 9.4.
Description	Configure the logical demultiplexing (demux) source family type on the IP demux underlying interface.
	<div> NOTE: The IP demux interface feature currently supports only Fast Ethernet, Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet underlying interfaces.</div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring an IP Demux Underlying Interface</i>

description (Interfaces)

Syntax	<code>description text;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i>],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</code>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p>
Description	<p>Provide a textual description of the interface or the logical unit. Any descriptive text you include is displayed in the output of the show interfaces commands, and is also exposed in the ifAlias Management Information Base (MIB) object. It has no effect on the operation of the interface on the router or switch.</p> <p>The textual description can also be included in the extended DHCP relay option 82 Agent Circuit ID suboption.</p>
Options	text —Text to describe the interface. If the text includes spaces, enclose the entire text in quotation marks.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Interface Description</i> • Adding a Logical Unit Description to the Configuration on page 19 • <i>Configuring Gigabit Ethernet Interfaces (CLI Procedure)</i> • <i>Configuring Gigabit and 10-Gigabit Ethernet Interfaces</i> • <i>Enabling and Disabling Insertion of Option 82 Information</i> • <i>Junos OS Network Interfaces Library for Routing Devices</i>

destination (Tunnels)

Syntax	<code>destination address;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet address <i>address</i>],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet unnumbered-address <i>interface-name</i>],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet address <i>address</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet unnumbered-address <i>interface-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.1 for EX Series switches.
Description	For encrypted, PPP-encapsulated, and tunnel interfaces, specify the remote address of the connection.
Options	address —Address of the remote side of the connection.
Required Privilege Level	interface —To view this statement in the configuration. interface-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the Interface Address</i>• <i>Configuring Generic Routing Encapsulation Tunneling (CLI Procedure)</i>• <i>Junos OS Services Interfaces Library for Routing Devices</i>• point-to-point on page 141

destination (Routing Instance)

Syntax	<code>destination <i>routing-instance-name</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel routing-instance], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel routing-instance]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the destination routing instance that points to the routing table containing the tunnel destination address.
Default	The default Internet routing table inet.0 .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

interface (Port Mirroring)

Syntax	<code>interface <i>interface-name</i> { next-hop <i>address</i>; }</code>
Hierarchy Level	[edit forwarding-options port-mirroring family (inet inet6) output]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the output interface for sending copies of packets elsewhere to be analyzed.
Options	<p><i>interface-name</i>—Name of the interface.</p> <p>The remaining statements are explained separately.</p>
Usage Guidelines	See <i>Configuring Port Mirroring</i> .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

dial-string

Syntax	<code>dial-string [<i>dial-string-numbers</i>];</code>
Hierarchy Level	[edit interfaces <i>br-pim</i> /O/ <i>port</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>br-pim</i> /O/ <i>port</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, specify one or more ISDN dial strings used to reach a destination subnetwork.
Options	<i>dial-string-numbers</i> —One or more strings of numbers to call.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the Dialer Interface</i>

dialer-options

Syntax	<pre> dialer-options { activation-delay seconds; callback; callback-wait-period time; deactivation-delay seconds; dial-string [dial-string-numbers]; idle-timeout seconds; incoming-map { caller caller-number accept-all; initial-route-check seconds; load-interval seconds; load-threshold percent; pool pool-name; redial-delay time; watch-list { [routes]; } } } </pre>
Hierarchy Level	<pre> [edit interfaces umd0], [edit interfaces dln unit logical-unit-number], [edit logical-systems logical-system-name interfaces dln unit logical-unit-number] </pre>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Specify the dialer options for configuring logical interfaces for group and user sessions.</p> <p>The statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Configuring ISDN Logical Interface Properties</i> <i>Junos OS Services Interfaces Library for Routing Devices</i>

disable (Interface)

Syntax	disable;
Hierarchy Level	[edit interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Description	Disable a physical or a logical interface, effectively unconfiguring it.



CAUTION:

- Dynamic subscribers and logical interfaces use physical interfaces for connection to the network. The Junos OS allows you to set the interface to disable and commit the change while dynamic subscribers and logical interfaces are still active. This action results in the loss of all subscriber connections on the interface. Use care when disabling interfaces.
- If aggregated SONET links are configured between a T1600 router and a T4000 router, interface traffic is disrupted when you disable the physical interface configured on the T1600 router. If you want to remove the interface, we recommend that you deactivate the interface instead of disabling it.



NOTE:

- When you use the disable statement at the [edit interfaces] hierarchy level, depending on the PIC type, the interface might or might not turn off the laser. Older PIC transceivers do not support turning off the laser, but newer Gigabit Ethernet (GE) PICs with SFP and XFP transceivers do support it and the laser will be turned off when the interface is disabled.
- When you disable or deactivate an interface, then all the references made to the deactivated interface must be removed from the routing instance.



WARNING: Do not stare into the laser beam or view it directly with optical instruments even if the interface has been disabled.

Required Privilege interface—To view this statement in the configuration.
Level interface-control—To add this statement to the configuration.

Related Documentation

- *Disabling a Physical Interface*
- [Disabling a Logical Interface on page 31](#)

disable-mlppp-inner-ppp-pfc

Syntax disable-mlppp-inner-ppp-pfc;

Hierarchy Level [edit interfaces *interface-name* [unit](#) *logical-unit-number*],
 [edit logical-systems *logical-system-name* interfaces *interface-name* [unit](#) *logical-unit-number*]

Release Information Statement introduced in Junos OS Release 8.2.

Description For MLPPP interfaces only, disable compression of the inner PPP header in the MLPPP payload. By default, compression is enabled.

Required Privilege interface—To view this statement in the configuration.
Level interface-control—To add this statement to the configuration.

Related Documentation

- *Junos OS Services Interfaces Library for Routing Devices*

dlci

Syntax	<code>dlci <i>dlci-identifier</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For Frame Relay and Multilink Frame Relay (MLFR) user-to-network interface (UNI) network-to-network interface (NNI) encapsulation only, and for link services, voice services and point-to-point interfaces only, configure the data-link connection identifier (DLCI) for a permanent virtual circuit (PVC) or an switched virtual circuit (SVC).</p> <p>To configure a DLCI for a point-to-multipoint interface, use the multipoint-destination statement to specify the DLCI.</p>
Options	<p><i>dlci-identifier</i>—Data-link connection identifier.</p> <p>Range: 16 through 1022.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Data-Link Connection Identifiers on Channelized Interfaces</i>• <i>Configuring Frame Relay DLCIs</i>• <i>Junos OS Services Interfaces Library for Routing Devices</i>• encapsulation (Logical Interface) on page 96• multicast-dlci on page 127• <i>multipoint-destination</i>

drop-timeout

Syntax	<code>drop-timeout <i>milliseconds</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For link services, multilink, and voice services interfaces only, configure the drop timeout period, in milliseconds.
Options	<i>milliseconds</i> —Drop timeout period. Range: 0 through 2000 milliseconds Default: 0 ms (disabled)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

dynamic-call-admission-control

Syntax	<pre>dynamic-call-admission-control { activation-priority <i>priority</i>; bearer-bandwidth-limit <i>kilobits-per-second</i>; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 8.2.
Description	<p>(J4350 and J6350 Services Routers supporting voice over IP with the TGM550 media gateway module) For Fast Ethernet and Gigabit Ethernet interfaces, ISDN BRI interfaces, and serial interfaces with PPP or Frame Relay encapsulation, configure dynamic call admission control (CAC). Dynamic CAC provides enhanced control over WAN bandwidth. When dynamic CAC is configured on an interface responsible for providing call bandwidth, the TGM550 informs the Media Gateway Controller (MGC) of the bandwidth limit available for voice packets on the interface and requests the MGC to block new calls when the bandwidth is exhausted.</p> <p>Dynamic CAC must be configured on each Services Router interface responsible for providing call bandwidth.</p> <p>The statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Dynamic Call Admission Control on page 30• <i>Junos OS Services Interfaces Library for Routing Devices</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

dynamic-profile (PPP)

Syntax	dynamic-profile <i>profile-name</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options]
Release Information	Statement introduced in Junos OS Release 9.5. Support for MLPPP on LSQ interfaces introduced in Junos OS Release 10.2.
Description	Specify the dynamic profile that is attached to the interface. On the MX Series routers, this statement is currently supported on PPPoE interfaces only. On the M120 and M320 routers, this statement is supported for MLPPP bundles only on LSQ interfaces on Adaptive Services PICs and Multiservices PICs.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Dynamic Profiles Overview</i>• <i>Configuring a Basic Dynamic Profile</i>• <i>Attaching Dynamic Profiles to Static PPP Subscriber Interfaces</i>• <i>Attaching Dynamic Profiles to MLPPP Bundles</i>• For hardware requirements, see <i>Hardware Requirements for PPP Subscriber Services on Non-Ethernet Interfaces</i>

encapsulation (Logical Interface)

Syntax	encapsulation (atm-ccc-cell-relay atm-ccc-vc-mux atm-cisco-nlpid atm-mlppp-llc atm-nlpid atm-ppp-llc atm-ppp-vc-mux atm-snap atm-tcc-snap atm-tcc-vc-mux atm-vc-mux ether-over-atm-llc ether-vpls-over-atm-llc ether-vpls-over-fr ether-vpls-over-ppp ethernet ethernet-ccc ethernet-vpls ethernet-vpls-fr frame-relay-ccc frame-relay-ether-type frame-relay-ether-type-tcc frame-relay-ppp frame-relay-tcc gre-fragmentation multilink-frame-relay-end-to-end multilink-ppp ppp-over-ether ppp-over-ether-over-atm-llc vlan-bridge vlan-ccc vlan-vci-ccc vlan-tcc vlan-vpls);
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>rlsq number</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers (vlan-ccc and vlan-tcc options only). Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers. Only the atm-ccc-cell-relay and atm-ccc-vc-mux options are supported on ACX Series routers.
Description	Configure a logical link-layer encapsulation type.
Options	<p>atm-ccc-cell-relay—Use ATM cell-relay encapsulation.</p> <p>atm-ccc-vc-mux—Use ATM virtual circuit (VC) multiplex encapsulation on CCC circuits. When you use this encapsulation type, you can configure the ccc family only.</p> <p>atm-cisco-nlpid—Use Cisco ATM network layer protocol identifier (NLPID) encapsulation. When you use this encapsulation type, you can configure the inet family only.</p> <p>atm-mlppp-llc—For ATM2 IQ interfaces only, use Multilink Point-to-Point (MLPPP) over AAL5 LLC. For this encapsulation type, your router must be equipped with a Link Services or Voice Services PIC. MLPPP over ATM encapsulation is not supported on ATM2 IQ OC48 interfaces.</p> <p>atm-nlpid—Use ATM NLPID encapsulation. When you use this encapsulation type, you can configure the inet family only.</p> <p>atm-ppp-llc—(ATM2 IQ interfaces and MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP only) Use PPP over AAL5 LLC encapsulation.</p> <p>atm-ppp-vc-mux—(ATM2 IQ interfaces and MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP only) Use PPP over ATM AAL5 multiplex encapsulation.</p> <p>atm-snap—(All interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) Use ATM subnetwork attachment point (SNAP) encapsulation.</p> <p>atm-tcc-snap—Use ATM SNAP encapsulation on translational cross-connect (TCC) circuits.</p>

atm-tcc-vc-mux—Use ATM VC multiplex encapsulation on TCC circuits. When you use this encapsulation type, you can configure the **tcc** family only.

atm-vc-mux—(All interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) Use ATM VC multiplex encapsulation. When you use this encapsulation type, you can configure the **inet** family only.

ether-over-atm-llc—(All IP interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) For interfaces that carry IP traffic, use Ethernet over ATM LLC encapsulation. When you use this encapsulation type, you cannot configure multipoint interfaces.

ether-vpls-over-atm-llc—For ATM2 IQ interfaces only, use the Ethernet virtual private LAN service (VPLS) over ATM LLC encapsulation to bridge Ethernet interfaces and ATM interfaces over a VPLS routing instance (as described in RFC 2684, *Multiprotocol Encapsulation over ATM Adaptation Layer 5*). Packets from the ATM interfaces are converted to standard ENET2/802.3 encapsulated Ethernet frames with the frame check sequence (FCS) field removed.

ether-vpls-over-fr—For E1, T1, E3, T3, and SONET interfaces only, use the Ethernet virtual private LAN service (VPLS) over Frame Relay encapsulation to support Bridged Ethernet over Frame Relay encapsulated TDM interfaces for VPLS applications, per RFC 2427, *Multiprotocol Interconnect over Frame Relay*.



NOTE: The SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, and the DS3/E3 MIC do not support Ethernet over Frame Relay encapsulation.

ether-vpls-over-ppp—For E1, T1, E3, T3, and SONET interfaces only, use the Ethernet virtual private LAN service (VPLS) over Point-to-Point Protocol (PPP) encapsulation to support Bridged Ethernet over PPP-encapsulated TDM interfaces for VPLS applications.

ethernet—Use Ethernet II encapsulation (as described in RFC 894, *A Standard for the Transmission of IP Datagrams over Ethernet Networks*).

ethernet-ccc—Use Ethernet CCC encapsulation on Ethernet interfaces.

ethernet-vpls—Use Ethernet VPLS encapsulation on Ethernet interfaces that have VPLS enabled and that must accept packets carrying standard Tag Protocol ID (TPID) values.



NOTE: The built-in Gigabit Ethernet PIC on an M7i router does not support extended VLAN VPLS encapsulation.

ethernet-vpls-fr—Use in a VPLS setup when a CE device is connected to a PE device over a time-division multiplexing (TDM) link. This encapsulation type enables the PE device to terminate the outer layer 2 Frame Relay connection, use the 802.1p bits inside the inner Ethernet header to classify the packets, look at the MAC address from the Ethernet header, and use the MAC address to forward the packet into a given VPLS instance.

frame-relay-ccc—Use Frame Relay encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

frame-relay-ether-type—Use Frame Relay ether type encapsulation for compatibility with Cisco Frame Relay. The physical interface must be configured with flexible-frame-relay encapsulation.

frame-relay-ether-type-tcc—Use Frame Relay ether type TCC for Cisco-compatible Frame Relay on TCC circuits to connect different media. The physical interface must be configured with flexible-frame-relay encapsulation.

frame-relay-ppp—Use PPP over Frame Relay circuits. When you use this encapsulation type, you can configure the **ppp** family only. J Series routers do not support frame-relay-ppp encapsulation.

frame-relay-tcc—Use Frame Relay encapsulation on TCC circuits for connecting different media. When you use this encapsulation type, you can configure the **tcc** family only.

gre-fragmentation—For adaptive services interfaces only, use GRE fragmentation encapsulation to enable fragmentation of IPv4 packets in GRE tunnels. This encapsulation clears the do not fragment (DF) bit in the packet header. If the packet's size exceeds the tunnel's maximum transmission unit (MTU) value, the packet is fragmented before encapsulation.

multilink-frame-relay-end-to-end—Use MLFR FRF.15 encapsulation. This encapsulation is used only on multilink, link services, and voice services interfaces and their constituent T1 or E1 interfaces, and is supported on LSQ and redundant LSQ interfaces.

multilink-ppp—Use MLPPP encapsulation. This encapsulation is used only on multilink, link services, and voice services interfaces and their constituent T1 or E1 interfaces.

ppp-over-ether—For underlying Ethernet interfaces on J Series routers, use PPP over Ethernet encapsulation. When you use this encapsulation type, you cannot configure the interface address. Instead, configure the interface address on the PPP interface. You also use PPP over Ethernet encapsulation to configure an underlying Ethernet interface for a dynamic PPPoE logical interface on M120 and M320 routers with Intelligent Queuing 2 (IQ2) PICs, and on MX Series routers with MPCs.

ppp-over-ether-over-atm-llc—(J Series routers and MX Series routers with MPCs using the ATM MIC with SFP only) For underlying ATM interfaces, use PPP over Ethernet over ATM LLC encapsulation. When you use this encapsulation type, you cannot configure the interface address. Instead, configure the interface address on the PPP interface.

vlan-bridge—Use Ethernet VLAN bridge encapsulation on Ethernet interfaces that have IEEE 802.1Q tagging, flexible-ethernet-services, and bridging enabled and that must accept packets carrying TPID 0x8100 or a user-defined TPID.

vlan-ccc—Use Ethernet virtual LAN (VLAN) encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

vlan-vci-ccc—Use ATM-to-Ethernet interworking encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

vlan-tcc—Use Ethernet VLAN encapsulation on TCC circuits. When you use this encapsulation type, you can configure the **tcc** family only.

vlan-vpls—Use Ethernet VLAN encapsulation on VPLS circuits.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Layer 2 Switching Cross-Connects Using CCC*
- *Configuring the Encapsulation for Layer 2 Switching TCCs*
- [Configuring Interface Encapsulation on Logical Interfaces on page 23](#)
- *Configuring MPLS LSP Tunnel Cross-Connects Using CCC*
- *Circuit and Translational Cross-Connects Overview*
- *Identifying the Access Concentrator*
- *Configuring ATM Interface Encapsulation*
- *Configuring VLAN Encapsulation*
- *Configuring Extended VLAN Encapsulation*
- *Configuring ISDN Logical Interface Properties*
- *Configuring ATM-to-Ethernet Interworking*
- *Configuring Interface Encapsulation on PTX Series Packet Transport Routers*
- *Configuring CCC Encapsulation for Layer 2 VPNs*
- *Configuring TCC Encapsulation for Layer 2 VPNs and Layer 2 Circuits*
- *Configuring ATM for Subscriber Access*
- *Junos OS Services Interfaces Library for Routing Devices*
- *CoS on ATM IMA Pseudowire Interfaces Overview*
- *Configuring Policing on an ATM IMA Pseudowire*

epd-threshold (Physical Interface)

Syntax	<code>epd-threshold cells plp1 cells;</code>
Hierarchy Level	[edit interfaces at- <i>fpc/pic/port</i> atm-options scheduler-maps <i>map-name</i> forwarding-class <i>class-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM2 IQ interfaces only, define the EPD threshold on a VC. The EPD threshold is a limit on the number of transmit packets that can be queued. Packets that exceed the limit are discarded.
Default	If you do not include either the epd-threshold or the linear-red-profile statement in the forwarding class configuration, the Junos OS uses an EPD threshold based on the available bandwidth and other parameters.
Options	cells —Maximum number of cells. Range: For 1-port and 2-port OC12 interfaces, 48 through 425,984 cells. For 1-port OC48 interfaces, 48 through 425,984 cells. For 2-port OC3, DS3, and E3 interfaces, 48 through 212,992 cells. For 4-port DS3 and E3 interfaces, 48 through 106,496 cells. The plp1 statement is explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring an ATM Scheduler Map</i>• <i>linear-red-profile</i>

family

```

Syntax  family family {
        accounting {
            destination-class-usage;
            source-class-usage {
                (input | output | input output);
            }
        }
        access-concentrator name;
        address address {
            ... the address subhierarchy appears after the main [edit interfaces interface-name unit
                logical-unit-number family family-name] hierarchy ...
        }
        bridge-domain-type (bvlan | svlan);
        bundle interface-name;
        core-facing;
        demux-destination {
            destination-prefix;
        }
        demux-source {
            source-prefix;
        }
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
            group filter-group-number;
            input filter-name;
            input-list [ filter-names ];
            output filter-name;
            output-list [ filter-names ];
        }
        interface-mode (access | trunk);
        ipsec-sa sa-name;
        isid-list all-service-groups;
        keep-address-and-control;
        mac-validate (loose | strict);
        max-sessions number;
        max-sessions-vsa-ignore;
        mtu bytes;
        multicast-only;
        negotiate-address;
        no-redirects;
        policer {
            arp policer-template-name;
            input policer-template-name;
            output policer-template-name;
        }
        primary;
        protocols [inet iso mpls];
        proxy inet-address address;
        receive-options-packets;
        receive-ttl-exceeded;
        remote (inet-address address | mac-address address);
    }

```

```
rpf-check {
    fail-filter filter-name
    mode loose;
}
sampling {
    input;
    output;
}
service {
    input {
        post-service-filter filter-name;
        service-set service-set-name <service-filter filter-name>;
    }
    output {
        service-set service-set-name <service-filter filter-name>;
    }
}
service-name-table table-name
short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
    maximum-seconds>;
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
translate-plp-control-word-de;
unnumbered-address interface-name destination address destination-profile profile-name;
vlan-id number;
vlan-id-list [number number-number];
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast address;
    destination address;
    destination-profile name;
    eui-64;
    master-only;
    multipoint-destination address dlci dlci-identifier;
    multipoint-destination address {
        epd-threshold cells;
        inverse-arp;
        oam-liveness {
            up-count cells;
            down-count cells;
        }
        oam-period (disable | seconds);
        shaping {
            (cbr rate | rtvbr burst length peak rate sustained rate | vbr burst length peak rate
                sustained rate);
            queue-length number;
        }
        vci vpi-identifier.vci-identifier;
    }
}
preferred;
primary;
vrrp-group group-id {
    (accept-data | no-accept-data);
    advertise-interval seconds;
    authentication-key key;
    authentication-type authentication;
```

```

fast-interval milliseconds;
(preempt | no-preempt) {
    hold-time seconds;
}
priority number;
track {
    interface interface-name {
        bandwidth-threshold bits-per-second priority-cost priority;
        priority-cost priority;
    }
    priority-hold-time seconds;
    route prefix routing-instance instance-name priority-cost priority;
}
virtual-address [ addresses ];
}
virtual-link-local-address ipv6-address;
}

```

Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Option max-sessions-vs-a-ignore introduced in Junos OS Release 11.4.
Description	Configure protocol family information for the logical interface.



NOTE: Not all subordinate stanzas are available to every protocol family.

Options *family*—Protocol family:

- **any**—Protocol-independent family used for Layer 2 packet filtering



NOTE: This option is not supported on T4000 Type 5 FPCs.

- **ethernet-switching**—(M Series and T Series routers only) Configure only when the physical interface is configured with **ethernet-bridge** type encapsulation or when the logical interface is configured with **vlan-bridge** type encapsulation
- **ccc**—Circuit cross-connect protocol suite
- **inet**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite
- **iso**—International Organization for Standardization Open Systems Interconnection (ISO OSI) protocol suite
- **mlfr-end-to-end**—Multilink Frame Relay FRF.15
- **mlfr-uni-nni**—Multilink Frame Relay FRF.16
- **multilink-ppp**—Multilink Point-to-Point Protocol
- **mpls**—Multiprotocol Label Switching (MPLS)
- **pppoe**—Point-to-Point Protocol over Ethernet
- **tcc**—Translational cross-connect protocol suite
- **tnp**—Trivial Network Protocol
- **vpls**—(M Series and T Series routers only) Virtual private LAN service


The remaining statements are explained separately.

Required Privilege Level *interface*—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Protocol Family*
- *Example: Configuring E-LINE and E-LAN Services for a PBB Network on MX Series Routers*
- *Junos OS Services Interfaces Library for Routing Devices*

fast-aps-switch

Syntax	fast-aps-switch;
Hierarchy Level	[edit interfaces <i>interface-name</i> sonet-options aps]
Release Information	Statement introduced in Junos OS Release 12.1.
Description	(M320 routers with Channelized OC3/STM1 Circuit Emulation PIC with SFP only and EX Series switches) Reduce the Automatic Protection Switching (APS) switchover time in Layer 2 circuits.
	<div>  <p>NOTE:</p> <ul style="list-style-type: none"> Configuring this statement reduces the APS switchover time only when the Layer 2 circuit encapsulation type for the interface receiving traffic from a Layer 2 circuit neighbor is SAToP. When the fast-aps-switch statement is configured in revertive APS mode, you must configure an appropriate value for revert time to achieve reduction in APS switchover time. To prevent the logical interfaces in the data path from being shut down, configure appropriate hold-time values on all the interfaces in the data path that support TDM. The fast-aps-switch statement cannot be configured when the APS annex-b option is configured. The interfaces that have the fast-aps-switch statement configured cannot be used in virtual private LAN service (VPLS) environments. </div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Reducing APS Switchover Time in Layer 2 Circuits</i>

filter

Syntax	<pre>filter { group <i>filter-group-number</i>; input <i>filter-name</i>; input-list [<i>filter-names</i>]; output <i>filter-name</i>; output-list [<i>filter-names</i>]; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Apply a filter to an interface. You can also use filters for encrypted traffic. When you configure filters, you can configure them under the family ethernet-switching , inet , inet6 , mpls , or vpls only.
Options	<p>group <i>filter-group-number</i>—Define an interface to be part of a filter group. Range: 1 through 255</p> <p>input <i>filter-name</i>—Name of one filter to evaluate when packets are received on the interface.</p> <p>output <i>filter-name</i>—Name of one filter to evaluate when packets are transmitted on the interface.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	interface —To view this statement in the configuration. interface-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Applying a Filter to an Interface</i>• <i>Junos OS Services Interfaces Library for Routing Devices</i>• <i>Routing Policy Feature Guide for Routing Devices</i>• <i>Junos OS Administration Library for Routing Devices</i>• <i>Configuring Gigabit Ethernet Interfaces (CLI Procedure)</i>• <i>Configuring Firewall Filters (CLI Procedure)</i>• <i>Configuring Firewall Filters and Policers for VPLS</i>• <i>family</i>

f-max-period

Syntax	f-max-period <i>number</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> rtp]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For all adaptive services interfaces and for ISDN interfaces on J Series Services Routers. Specify the maximum number of compressed packets allowed between the transmission of full headers in a compressed Real-Time Transport Protocol (RTP) traffic stream.
Options	<i>number</i> —Maximum number of packets. The value can be from 1 through 65535.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Bandwidth on Demand</i> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

fragment-threshold

Syntax	fragment-threshold <i>bytes</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For multilink, link services, and voice services interfaces, and for J Series Services Routers ISDN interfaces, set the fragmentation threshold.
Options	<i>bytes</i> —Maximum size, in bytes, for multilink packet fragments. Any nonzero value must be a multiple of 64 bytes. Range: 128 through 16,320 bytes Default: 0 bytes (no fragmentation)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring ISDN Logical Interface Properties</i> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

idle-timeout

Syntax	<code>idle-timeout seconds;</code>
Hierarchy Level	[edit interfaces <i>dl</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure the number of seconds the link is idle before losing connectivity.
Options	seconds —Time for which the connection can remain idle. For interfaces configured to use a filter for traffic, the idle timeout is based on traffic. Range: 1 through 429497295 Default: 120 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring ISDN Logical Interface Properties</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

incoming-map

Syntax	incoming-map { <code>caller caller-number</code> accept-all; }
Hierarchy Level	[edit interfaces <code>dl</code> unit <i>logical-unit-number</i> <code>dialer-options</code>], [edit logical-systems <i>logical-system-name</i> interfaces <code>dl</code> unit <i>logical-unit-number</i> <code>dialer-options</code>]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	On J Series Services Routers with interfaces configured for ISDN, specify the dialer to accept incoming calls. The statements are explained separately.



NOTE: The `incoming-map` statement is mandatory for the router to accept any incoming ISDN calls.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Configuring Dial-In and Callback</i> <i>Junos OS Interfaces and Routing Configuration Guide</i>

initial-route-check

Syntax	<code>initial-route-check seconds;</code>
Hierarchy Level	[edit interfaces <i>dl</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, allows the router to check whether the primary route is up after the initial startup of the router is complete and the timer expires.
Options	seconds —How long to wait to check if the primary interface is up after the router comes up. Range: 1 through 300 seconds Default: 120 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>ISDN Interfaces Overview</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

inner-tag-protocol-id

Syntax	<code>inner-tag-protocol-id <i>tpid</i>;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Configure the IEEE 802.1Q TPID value to rewrite for the inner tag.</p> <p>All TPIDs you include in input and output VLAN maps must be among those you specify at the [edit interfaces <i>interface-name</i> gether-options ethernet-switch-profile tag-protocol-id [<i>tpids</i>]] hierarchy level.</p> <p>On MX Series routers, you can use this statement for Gigabit Ethernet IQ, IQ2 and IQ2-E interfaces, and for aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs.</p>
Default	If the inner-tag-protocol-id statement is not configured, the TPID value is 0x8100.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Configuring Inner and Outer TPIDs and VLAN IDs</i>

inner-vlan-id

Syntax	<code>inner-vlan-id <i>number</i>;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i></code> <code>input-vlan-map],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i></code> <code>output-vlan-map]</code>
Release Information	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>For Gigabit Ethernet IQ, IQ2 and IQ2-E interfaces, and for aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs on MX Series routers or 100-Gigabit Ethernet Type 5 PIC with CFP, or on Ethernet interfaces on EX Series switches, specify the VLAN ID to rewrite for the inner tag of the final packet.</p> <p>You cannot include the inner-vlan-id statement with the swap statement, swap-push statement, push-push statement, or push-swap statement and the inner-vlan-id statement at the <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]</code> hierarchy level. If you include any of those statements in the output VLAN map, the VLAN ID in the outgoing frame is rewritten to the inner-vlan-id statement you include at the <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</code> hierarchy level.</p>
Options	number —VLAN ID number. Range: 0 through 4094
Required Privilege Level	interface —To view this statement in the configuration. interface-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Inner and Outer TPIDs and VLAN IDs</i>

inner-vlan-id-range

Syntax	<code>inner-vlan-id-range start <i>start-id</i> end <i>end-id</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],
Release Information	Statement introduced in Junos OS Release 9.0.
Description	The range of VLAN IDs to be used in the ATM-to-Ethernet interworking cross-connect. Specify the starting VLAN ID and ending VLAN ID.
Options	<i>start-id</i> —The lowest VLAN ID to be used. <i>end-id</i> —The highest VLAN ID to be used. Range: 32 through 4094
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring ATM-to-Ethernet Interworking</i>

input-policer

Syntax	<code>input-policer <i>policer-name</i>;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer]</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer]</code>
Release Information	Statement introduced in Junos OS Release 8.2. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Apply a single-rate two-color policer to the Layer 2 input traffic at the logical interface. The input-policer and input-three-color statements are mutually exclusive.
Options	<i>policer-name</i> —Name of the single-rate two-color policer that you define at the [edit firewall] hierarchy level.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Two-Color and Three-Color Policers at Layer 2</i>• <i>Applying Layer 2 Policers to Gigabit Ethernet Interfaces</i>• <i>Configuring a Gigabit Ethernet Policer</i>• input-three-color on page 115• layer2-policer on page 118• <i>logical-interface-policer</i>• output-policer on page 133• output-three-color on page 134

input-three-color

Syntax	<code>input-three-color <i>policer-name</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer] [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer]
Release Information	Statement introduced in Junos OS Release 8.2. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Apply a single-rate or two-rate three-color policer to the Layer 2 input traffic at the logical interface. The input-three-color and input-policer statements are mutually exclusive.
Options	<i>policer-name</i> —Name of the single-rate or two-rate three-color policer.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Two-Color and Three-Color Policers at Layer 2</i> • <i>Applying Layer 2 Policers to Gigabit Ethernet Interfaces</i> • <i>Configuring a Gigabit Ethernet Policer</i> • input-policer on page 114 • layer2-policer on page 118 • <i>logical-interface-policer</i> • output-policer on page 133 • output-three-color on page 134

input-vlan-map (Gigabit Ethernet IQ, 10-Gigabit Ethernet SFPP, 10-Gigabit Ethernet SFP, and 100-Gigabit Ethernet Type 5 PIC with CFP)

Syntax	<pre>input-vlan-map { (pop pop-pop pop-swap push push-push swap swap-push swap-swap); inner-tag-protocol-id <i>tpid</i>; inner-vlan-id <i>number</i>; tag-protocol-id <i>tpid</i>; vlan-id <i>number</i>; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. pop-pop , pop-swap , push-push , swap-push , and swap-swap statements introduced in Junos OS Release 8.1.
Description	For Gigabit Ethernet IQ, 10-Gigabit Ethernet SFPP interfaces, 10-Gigabit Ethernet SFP interfaces, and 100-Gigabit Ethernet Type 5 PIC with CFP only, define the rewrite profile to be applied to incoming frames on this logical interface. The statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Stacking a VLAN Tag• output-vlan-map (Gigabit Ethernet IQ, 10-Gigabit Ethernet with SFPP, 10-Gigabit Ethernet SFP, and 100-Gigabit Ethernet Type 5 PIC with CFP) on page 135

interleave-fragments

Syntax	<pre>interleave-fragments;</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For link services interfaces only, interleave long packets with high-priority packets. Allows small delay-sensitive packets, such as Voice over IP (VoIP) packets, to interleave with long fragmented packets. This minimizes the latency of delay-sensitive packets.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Junos OS Services Interfaces Library for Routing Devices

inverse-arp

Syntax	<code>inverse-arp;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet address <i>address</i> multipoint-destination <i>destination</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet address <i>address</i> multipoint-destination <i>destination</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for the QFX Series.
Description	For ATM encapsulation, enable responses to receive inverse ATM ARP requests. For Frame Relay encapsulation, enable responses to receive inverse Frame Relay ARP requests.
Default	Inverse ARP is disabled on all ATM and Frame Relay interfaces.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Inverse ATM1 or ATM2 ARP</i> • <i>Configuring Inverse Frame Relay ARP</i>

key

Syntax	<code>key <i>number</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For Adaptive Services PICs on M Series routers (except the M320 and M120 routers), identify an individual traffic flow within a tunnel, as defined in RFC 2890, <i>Key and Sequence Number Extensions to GRE</i> .
Options	<i>number</i> —Value of the key. Range: 0 through 4,294,967,295
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

layer2-policer

Syntax	<pre>layer2-policer { input-policer <i>policer-name</i>; input-three-color <i>policer-name</i>; output-policer <i>policer-name</i>; output-three-color <i>policer-name</i>; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],
Release Information	Statement introduced in Junos OS Release 8.2. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>For 1-Gigabit Ethernet and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces on M Series, MX Series, and T Series routers, and for aggregated Ethernet, Gigabit Ethernet, and 10-Gigabit Ethernet interfaces on EX Series switches, apply Layer 2 logical interface policers. The following policers are supported:</p> <ul style="list-style-type: none">• Two-color• Single-rate tricolor marking (srTCM)• Two-rate tricolor marking (trTCM) <p>Two-color and tricolor policers are configured at the [edit firewall] hierarchy level.</p>
Options	<p>input-policer <i>policer-name</i>—Two-color input policer to associate with the interface. This statement is mutually exclusive with the input-three-color statement.</p> <p>input-three-color <i>policer-name</i>—Tricolor input policer to associate with the interface. This statement is mutually exclusive with the input-policer statement.</p> <p>output-policer <i>policer-name</i>—Two-color output policer to associate with the interface. This statement is mutually exclusive with the output-three-color statement.</p> <p>output-three-color <i>policer-name</i>—Tricolor output policer to associate with the interface. This statement is mutually exclusive with the output-policer statement.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Applying Layer 2 Policers to Gigabit Ethernet Interfaces</i>• <i>Configuring Gigabit Ethernet Two-Color and Tricolor Policers</i>

lcp-max-conf-req

Syntax	<code>lcp-max-conf-req <i>number</i></code>
Hierarchy Level	<code>[edit interfaces <i>so-fpc/pic/port</i> unit <i>number</i> ppp-options]</code>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Set the maximum number of LCP Configure-Requests to be sent, after which the router goes to LCP down state.
Options	<p><i>number</i>—From 0 to 65,535, where 0 means send infinite LCP Configure-Requests, and any other value specifies the maximum number LCP Configure-Requests to send and then stop sending.</p> <p>Default—254</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the LCP Configure-Request Maximum Sent on page 25 • ppp-options on page 147

lcp-restart-timer

Syntax	<code>lcp-restart-timer <i>milliseconds</i>;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options]</code>
Release Information	Statement introduced in Junos OS Release 8.1.
Description	For interfaces with PPP, PPP TCC, PPP over Ethernet, PPP over ATM, and PPP over Frame Relay encapsulations, configure a restart timer for the Link Control Protocol (LCP) component of a PPP session.
Options	<p><i>milliseconds</i>—The time, in milliseconds, between successive LCP configuration requests.</p> <p>Range: 20 through 10000 milliseconds</p> <p>Default: 3 seconds</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PPP Restart Timers on page 26

link-layer-overhead

Syntax	link-layer-overhead <i>percent</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For AS PIC or MultiServices PIC link services IQ interfaces (lsq) only, configure the percentage of total bundle bandwidth to be set aside for link-layer overhead.
Options	percent —Percentage of total bundle bandwidth to be set aside for link-layer overhead. Range: 0 through 50 percent Default: 4 percent
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

load-interval

Syntax	load-interval <i>seconds</i> ;
Hierarchy Level	[edit interfaces <i>dl</i> <i>n</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl</i> <i>n</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN logical interfaces, specify the interval used to calculate the average load on the network. By default, the average interface load is calculated every 60 seconds.
Options	seconds —Number of seconds at which the average load calculation is triggered. Range: 20 through 180, in 10-second intervals Default: 60 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring ISDN Logical Interface Properties</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

load-threshold

Syntax	load-threshold <i>percent</i> ;
Hierarchy Level	[edit interfaces dln <i>unit logical-unit-number dialer-options</i>], [edit logical-systems <i>logical-system-name</i> interfaces dln <i>unit logical-unit-number dialer-options</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN logical interfaces, specify the bandwidth threshold percentage used for adding interfaces. Another link is added to the multilink bundle when the load reaches the threshold value you set. Specify a percentage between 0 and 100.
Options	<i>percent</i> —Bandwidth threshold percentage used for adding interfaces. When set to 0, all available channels are dialed. Range: 0 through 100 seconds Default: 100 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Bandwidth on Demand</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i>

local-name

Syntax	local-name <i>name</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> ppp-options chap], [edit interfaces <i>interface-name</i> ppp-options pap], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options chap], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options pap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options chap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options pap]
Release Information	Statement introduced before Junos OS Release 7.4. Support for PAP added in Junos OS Release 8.3.
Description	<p>For CHAP authentication, the value sent in CHAP challenge and response packets on a per interface basis. For PAP authentication, the local hostname for sending PAP authentication requests.</p> <p>For ATM2 IQ interfaces only, you can configure a CHAP local name on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:</p> <ul style="list-style-type: none">• atm-ppp-llc—PPP over AAL5 LLC encapsulation.• atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation.
Default	For CHAP authentication, if you do not include the local-name statement in the configuration, the interface sends the router's system hostname in CHAP challenge and response packets.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the PPP Challenge Handshake Authentication Protocol</i>• <i>Configuring the PPP Password Authentication Protocol</i>• <i>Junos OS Administration Library for Routing Devices</i>

local-password

Syntax	<code>local-password password;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> ppp-options pap], [edit interfaces <i>interface-name</i> unit logical-unit-number ppp-options pap], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit logical-unit-number ppp-options pap]
Release Information	Statement introduced in Junos OS Release 8.3.
Description	Configure the host password for sending PAP requests.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Local Password on page 29 • Configuring the PPP Password Authentication Protocol

loopback-clear-timer

Syntax	<code>loopback-clear-timer seconds;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit logical-unit-number ppp-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit logical-unit-number ppp-options]
Release Information	Statement introduced in Junos OS Release 8.5.
Description	For interfaces with PPP, PPP TCC, PPP over Ethernet, PPP over ATM, and PPP over Frame Relay encapsulations, configure a loop detection clear timer for the Link Control Protocol (LCP) component of a PPP session.
Options	<p>seconds—The time in seconds to wait before the loop detection flag is cleared if it is not cleared by the protocol.</p> <p>Range: 1 through 60 seconds</p> <p>Default: 9 seconds</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the PPP Clear Loop Detected Timer on page 26

mac-address (Accept Source Mac)

Syntax	<code>mac-address <i>mac-address</i> policer;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> accept-source-mac], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> accept-source-mac]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Description	For Gigabit Ethernet IQ and Gigabit Ethernet PICs with SFPs (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i router), for Gigabit Ethernet DPCs on MX Series routers, and 100-Gigabit Ethernet Type 5 PIC with CFP, specify a remote MAC address on which to count incoming and outgoing packets.
Options	<i>mac-address</i> —MAC address. Specify the MAC address as six hexadecimal bytes in one of the following formats: <i>nnnn.nnnn.nnnn</i> or <i>nn:nn:nn:nn:nn:nn</i> . For example, 0011.2233.4455 or 00:11:22:33:44:55. <i>policer</i> —MAC policer. For more information, see <i>policer (MAC)</i> .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring MAC Address Filtering</i>

minimum-links

Syntax	<code>minimum-links <i>number</i>;</code>
Hierarchy Level	<p>[edit interfaces <i>aex</i> aggregated-ether-options], [edit interfaces <i>aex</i> aggregated-sonet-options], [edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces interface-range <i>range</i> aggregated-ether-options], [edit interfaces interface-range <i>range</i> aggregated-sonet-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	For aggregated Ethernet, SONET/SDH, multilink, link services, and voice services interfaces only, set the minimum number of links that must be up for the bundle to be labeled up.
Options	<p><i>number</i>—Number of links.</p> <p>Range: On M120, M320, MX Series, T Series, and TX Matrix routers with Ethernet interfaces, the valid range for minimum-links number is 1 through 64. When the maximum value (16) is specified, all configured links of a bundle must be up for the bundle to be labeled up. On all other routers and on EX Series switches, other than EX8200 switches, the range of valid values for minimum-links number is 1 through 8. When the maximum value (8) is specified, all configured links of a bundle must be up for the bundle to be labeled up. On EX8200 switches, the range of valid values for minimum-links number is 1 through 12. When the maximum value (12) is specified, all configured links of a bundle must be up for the bundle to be labeled up.</p> <p>Default: 1</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Aggregated Ethernet Minimum Links</i> • <i>Configuring Aggregated SONET/SDH Minimum Links</i> • <i>Configuring Aggregated Ethernet Links (CLI Procedure)</i> • <i>Example: Configuring Aggregated Ethernet High-Speed Uplinks Between an EX4200 Virtual Chassis Access Switch and an EX4200 Virtual Chassis Distribution Switch</i> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

mrru

Syntax	<code>mrru bytes;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For multilink, link services, voice services, and J Series Services Routers ISDN interfaces only, set the maximum received reconstructed unit (MRRU). The MRRU is similar to the MTU, but is specific to multilink interfaces.
Options	bytes —MRRU size. Range: 1500 through 4500 bytes Default: 1500 bytes
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring ISDN Logical Interface Properties</i>• <i>mtu</i>• <i>Junos OS Services Interfaces Library for Routing Devices</i>

multicast-dlci

Syntax	<code>multicast-dlci <i>dlci-identifier</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For point-to-multipoint Frame Relay, link services, and voice services interfaces only, enable multicast support on the interface. You can configure multicast support on the interface if the Frame Relay switch performs multicast replication.
Options	<i>dlci-identifier</i> —DLCI identifier, a number from 16 through 1022 that defines the Frame Relay DLCI over which the switch expects to receive multicast packets for replication.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring a Multicast-Capable Frame Relay Connection</i> • dlci on page 92 • <i>multipoint-destination</i> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

multicast-vci

Syntax	<code>multicast-vci vpi-identifier.vci-identifier;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM encapsulation only, and for point-to-multipoint ATM logical interfaces only, enable the support of multicast on the interface. You can configure multicast support on the interface if the ATM switch performs multicast replication.
Options	<p><i>vci-identifier</i>—ATM virtual circuit identifier. Range: 0 through 16,384</p> <p><i>vpi-identifier</i>—ATM virtual path identifier. Range: 0 through 255 Default: 0</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring a Multicast-Capable ATM1 or ATM2 IQ Connection</i>• <i>multipoint-destination</i>• vci on page 177

multilink-max-classes

Syntax	<code>multilink-max-classes <i>number</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For Adaptive Services (AS) PIC link services IQ interfaces (lsq) only, configure the number of multilink classes to be negotiated when a link joins the bundle.
Options	<i>number</i> —The number of multilink classes to be negotiated when a link joins the bundle. Range: 1 through 8 Default: None
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i> • multipoint on page 129

multipoint

Syntax	<code>multipoint;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the interface unit as a multipoint connection.
Default	If you omit this statement, the interface unit is configured as a point-to-point connection.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring a Multipoint Connection on page 21 • point-to-point on page 141

ncp-max-conf-req

Syntax	<code>ncp-max-conf-req <i>number</i></code>
Hierarchy Level	[edit interfaces <i>so-fpc/pic/port unit number</i> ppp-options]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Set the maximum number of NCP Configure-Requests to be sent, after which the router goes to NCP down state.
Options	<i>number</i> —Ranges from 0 to 65535, where 0 means send infinite NCP Configure-Requests and any other value specifies the maximum number NCP Configure-Requests to send and then stop sending. Default —254 Range: 0 through 65,535
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the NCP Configure-Request Maximum Sent on page 25• ppp-options on page 147

ncp-restart-timer

Syntax	<code>ncp-restart-timer <i>milliseconds</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name unit logical-unit-number</i> ppp-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name unit logical-unit-number</i> ppp-options]
Release Information	Statement introduced in Junos OS Release 8.1.
Description	For interfaces with PPP and PPP TCC encapsulations and on multilink PPP bundle interfaces, configure a restart timer for the Network Control Protocol (NCP) component of a PPP session.
Options	<i>milliseconds</i> —The time in milliseconds between successive NCP configuration requests. Range: 500 through 10,000 milliseconds Default: 3 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PPP Restart Timers on page 26

oam-liveness

Syntax	oam-liveness { down-count <i>cells</i> ; up-count <i>cells</i> ; }
Hierarchy Level	[edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i> multipoint-destination <i>address</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i> multipoint-destination <i>address</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for the QFX Series.
Description	For ATM encapsulation only, configure Operation, Administration, and Maintenance (OAM) F5 loopback cell count thresholds. Not supported on ATM-over-SHDSL interfaces. For ATM2 IQ PICs only, configure OAM F4 loopback cell count thresholds at the [edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i>] hierarchy level.
Options	down-count <i>cells</i> —Minimum number of consecutive OAM F4 or F5 loopback cells lost before a VC is declared down. Range: 1 through 255 Default: 5 cells up-count <i>cells</i> —Minimum number of consecutive OAM F4 or F5 loopback cells received before a VC is declared up. Range: 1 through 255 Default: 5 cells
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> Configuring the ATM OAM F5 Loopback Cell Threshold

oam-period

Syntax	<code>oam-period (disable seconds);</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i> multipoint-destination <i>address</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i> multipoint-destination <i>address</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for the QFX Series.
Description	For ATM encapsulation only, configure the OAM F5 loopback cell period. Not supported on ATM-over-SHDSL interfaces. For ATM2 IQ PICs only, configure the OAM F4 loopback cell period at the [edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i>] hierarchy level.
Default	If you omit this statement, OAM F5 loopback cells are not initiated, but the interface still responds if it receives OAM F5 loopback cells.
Options	disable —Disable the OAM loopback cell transmit feature. seconds —OAM loopback cell period. Range: 1 through 900 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">Defining the ATM OAM F5 Loopback Cell Period

output-policer

Syntax	<code>output-policer <i>policer-name</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer]
Release Information	Statement introduced in Junos OS Release 8.2. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Apply a single-rate two-color policer to the Layer 2 output traffic at the logical interface. The output-policer and output-three-color statements are mutually exclusive.
Options	<i>policer-name</i> —Name of the single-rate two-color policer that you define at the [edit firewall] hierarchy level.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Two-Color and Three-Color Policers at Layer 2</i> • <i>Applying Layer 2 Policers to Gigabit Ethernet Interfaces</i> • <i>Configuring a Gigabit Ethernet Policer</i> • input-policer on page 114 • input-three-color on page 115 • layer2-policer on page 118 • <i>logical-interface-policer</i> • output-three-color on page 134


output-three-color

Syntax	<code>output-three-color <i>policer-name</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer] [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> layer2-policer]
Release Information	Statement introduced in Junos OS Release 8.2. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Apply a single-rate or two-rate three-color policer to the Layer 2 output traffic at the logical interface. The output-three-color and output-policer statements are mutually exclusive.
Options	<i>policer-name</i> —Name of the single-rate or two-rate three-color policer.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Two-Color and Three-Color Policers at Layer 2</i>• <i>Applying Layer 2 Policers to Gigabit Ethernet Interfaces</i>• <i>Configuring a Gigabit Ethernet Policer</i>• input-three-color on page 115• input-policer on page 114• layer2-policer on page 118• <i>logical-interface-policer</i>• output-policer on page 133

output-vlan-map (Gigabit Ethernet IQ, 10-Gigabit Ethernet with SFPP, 10-Gigabit Ethernet SFP, and 100-Gigabit Ethernet Type 5 PIC with CFP)

Syntax	<pre>output-vlan-map { (pop pop-pop pop-swap push push-push swap swap-push swap-swap); inner-tag-protocol-id <i>tpid</i>; inner-vlan-id <i>number</i>; tag-protocol-id <i>tpid</i>; vlan-id <i>number</i>; }</pre>
Hierarchy Level	<pre>[edit interfaces <i>interface-name</i> <i>unit</i> <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> <i>unit</i> <i>logical-unit-number</i>]</pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>pop-pop, pop-swap, push-push, swap-push, and swap-swap statements added in Junos OS Release 8.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>For Gigabit Ethernet IQ, 10-Port 10-Gigabit Ethernet SFPP interfaces, 10-Gigabit Ethernet SFP interfaces, and 100-Gigabit Ethernet Type 5 PIC with CFP only, define the rewrite operation to be applied to outgoing frames on this logical interface.</p> <p>The statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Stacking and Rewriting Gigabit Ethernet VLAN Tags</i> input-vlan-map (Gigabit Ethernet IQ, 10-Gigabit Ethernet SFPP, 10-Gigabit Ethernet SFP, and 100-Gigabit Ethernet Type 5 PIC with CFP) on page 116

pap

Syntax	<pre>pap { access-profile <i>name</i>; default-pap-password <i>password</i>; local-name <i>name</i>; local-password <i>password</i>; passive; }</pre>
Hierarchy Level	<pre>[edit interfaces <i>interface-name</i> ppp-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options]</pre>
Release Information	Statement introduced in Junos OS Release 8.3.
Description	<p>Configure the Password Authentication Protocol (PAP). Use PAP authentication as a means to provide a simple method for the peer to establish its identity using a two-way handshake. This is done only upon initial link establishment.</p> <p>After the link is established, an ID and password pair is repeatedly sent by the peer to the authenticator until authentication is acknowledged or the connection is terminated.</p>
	<div>  <p>BEST PRACTICE: On inline service (si) interfaces for L2TP, only the pap statement itself is typically used for subscriber management. We recommend that you leave the subordinate statements at their default values.</p> </div>
	The remaining statements are explained separately.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPP Challenge Handshake Authentication Protocol</i> • Configuring PPP PAP Authentication on page 28 • <i>Tracing Operations of the pppd Process</i> • <i>traceoptions (PPP Process)</i> • <i>Junos OS Administration Library for Routing Devices</i> • <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

passive (PAP)

Syntax	<code>passive;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> <code>ppp-options pap</code>], [edit interfaces <i>interface-name</i> <code>unit logical-unit-number ppp-options pap</code>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> <code>unit logical-unit-number ppp-options pap</code>]
Release Information	Statement introduced in Junos OS Release 8.3.
Description	Initiate an authentication request when the PAP option is received from a peer. If you omit this statement from the configuration, the interface requires the peer to initiate an authentication request.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Passive Mode</i> • <i>Junos OS Administration Library for Routing Devices</i>

passive-monitor-mode

Syntax	passive-monitor-mode;
Hierarchy Level	[edit interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Monitor packet flows from another router. If you include this statement in the configuration, the interface does not send keepalives or alarms, and does not participate actively on the network.</p> <p>This statement is supported on ATM, Ethernet, and SONET/SDH interfaces. For more information, see <i>ATM Interfaces Feature Guide for Routing Devices</i>.</p> <p>For ATM and Ethernet interfaces, you can include this statement on the physical interface only.</p> <p>For SONET/SDH interfaces, you can include this statement on the logical interface only.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Enabling Passive Monitoring on ATM Interfaces</i>• <i>Passive Monitoring on Ethernet Interfaces Overview</i>• <i>Enabling Passive Monitoring on SONET/SDH Interfaces</i>• <i>multiservice-options</i>• <i>Junos OS Services Interfaces Library for Routing Devices</i>

peer-unit

Syntax	<code>peer-unit <i>unit-number</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure a peer relationship between two logical systems.
Options	<i>unit-number</i> —Peering logical system unit number.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

pfc

Syntax	<code>pfc;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> ppp-options <i>compression</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options <i>compression</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options <i>compression</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For interfaces with PPP encapsulation, configure the router to compress the protocol field to one byte.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPP Protocol Field Compression</i>

plp1

Syntax	<code>plp1 cells;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i></code> <code> multipoint-destination <i>address</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i></code> <code> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for QFX Series switches.
Description	For ATM2 IQ interfaces only, define the EPD threshold on a VC. The EPD threshold is a limit on the number of transmit packets that can be queued. Packets that exceed the limit are discarded. This threshold applies to packets that have a PLP of 1.
Default	EPD threshold is unregulated.
Options	cells —Maximum number of cells. Range: For 1-port and 2-port OC12 interfaces, 1 through 425,984 cellsFor 1-port OC48 interfaces, 1 through 425,984 cellsFor 2-port OC3, DS3, and E3 interfaces, 1 through 212,992 cellsFor 4-port DS3 and E3 interfaces, 1 through 106,496 cells
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Two EPD Thresholds per Queue</i>• <i>Configuring an ATM Scheduler Map</i>• <i>linear-red-profile</i>

plp-to-clp

Syntax	plp-to-clp;
Hierarchy Level	[edit interfaces at- <i>fpc/pic/port</i> atm-options], [edit interfaces at- <i>fpc/pic/port</i> <i>unit</i> <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces at- <i>fpc/pic/port</i> <i>unit</i> <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM2 IQ interfaces only, enable the PLP setting to be copied to the cell-loss priority (CLP) bit.
Default	If you omit this statement, the Junos OS does not copy the PLP setting to the CLP bit.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Enabling the PLP Setting to Be Copied to the CLP Bit</i> • <i>Copying the PLP Setting to the CLP Bit on ATM Interfaces</i>

point-to-point

Syntax	point-to-point;
Hierarchy Level	[edit interfaces <i>interface-name</i> <i>unit</i> <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> <i>unit</i> <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For all interfaces except aggregated Ethernet, Fast Ethernet, and Gigabit Ethernet, configure the interface unit as a point-to-point connection. This is the default connection type.
Default	If you omit this statement, the interface unit is configured as a point-to-point connection.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring a Point-to-Point Connection on page 21 • multipoint on page 129

policer (CoS)

Syntax	<pre>policer <i>cos-policer-name</i> { aggregate { bandwidth-limit <i>bps</i>; burst-size-limit <i>bytes</i>; } premium { bandwidth-limit <i>bps</i>; burst-size-limit <i>bytes</i>; } }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> gigether-options ethernet-switch-profile ethernet-policer-profile]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For Gigabit Ethernet IQ, Gigabit Ethernet PICs with SFPs (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i router), and 100-Gigabit Ethernet Type 5 PIC with CFP, define a CoS policer template to specify the premium bandwidth and burst-size limits, and the aggregate bandwidth and burst-size limits. The premium policer is not supported on MX Series routers or for Gigabit Ethernet interfaces with SFPs (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i router).
Options	<p><i>cos-policer-name</i>—Name of one policer to specify the premium bandwidth and burst-size limits, and the aggregate bandwidth and burst-size limits.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Gigabit Ethernet Policers</i>

pool

Syntax	<code>pool <i>pool-name</i> <priority <i>priority</i>>;</code>
Hierarchy Level	[edit interfaces <code>br-pim/0/port</code> dialer-options], [edit interfaces <code>umd0</code> dialer-options], [edit interfaces <code>dlr unit <i>logical-unit-number</i></code> dialer-options], [edit logical-systems <code><i>logical-system-name</i> interfaces dlr unit <i>logical-unit-number</i></code> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers, for logical and physical ISDN interfaces, specify the dial pool. The dial pool allows logical (dialer) and physical (<code>br-pim/0/port</code>) interfaces to be bound together dynamically on a per-call basis. On a dialer interface, pool directs the dialer interface which dial pool to use. On <code>br-pim/0/port</code> interface, pool defines the pool to which the interface belongs.
Options	<i>pool-name</i> —Pool identifier. <i>priority priority</i> —(Physical <code>br-pim/0/port</code> interfaces only) Specify a priority value of 0 (lowest) to 255 (highest) for the interface within the pool.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Configuring ISDN Physical Interface Properties</i> <i>Junos OS Interfaces and Routing Configuration Guide</i>

pop

Syntax	pop;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	For Gigabit Ethernet IQ, 10-Gigabit Ethernet IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, aggregated Ethernet interfaces using Gigabit Ethernet IQ interfaces, 10-Gigabit Ethernet SFP interfaces, and 100-Gigabit Ethernet Type 5 PIC with CFP, specify the VLAN rewrite operation to remove a VLAN tag from the top of the VLAN tag stack. The outer VLAN tag of the frame is removed.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Removing a VLAN Tag</i>

pop-pop

Syntax	pop-pop;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	For Gigabit Ethernet IQ, IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, for aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs on MX Series routers, and 100-Gigabit Ethernet Type 5 PIC with CFP, and for 10-Gigabit Ethernet SFP interfaces on EX Series switches, specify the VLAN rewrite operation to remove both the outer and inner VLAN tags of the frame.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Removing the Outer and Inner VLAN Tags</i>

pop-swap

Syntax	pop-swap;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Specify the VLAN rewrite operation to remove the outer VLAN tag of the frame, and replace the inner VLAN tag of the frame with a user-specified VLAN tag value. The inner tag becomes the outer tag in the final frame. You can use this statement on Gigabit Ethernet IQ, IQ2, IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, on aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs on MX Series routers, and 100-Gigabit Ethernet Type 5 PIC with CFP.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Removing the Outer VLAN Tag and Rewriting the Inner VLAN Tag</i>

port

Syntax	<pre>port { minimum <i>port-number</i>; maximum <i>port-number</i>; }</pre>
Hierarchy Level	[edit interfaces vsp- <i>fpc/pic/port</i> unit <i>logical-unit-number</i> compression <i>rtp</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For voice services interfaces only, assign User Datagram Protocol (UDP) destination port numbers reserved for Real-Time Transport Protocol (RTP) traffic.
Options	<p>minimum <i>port-number</i>—Specify minimum port number. Range: 0 through 65,535</p> <p>maximum <i>port-number</i>—Specify maximum port number. Range: 0 through 65,535</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

ppp-options

Syntax	<pre> ppp-options { authentication [<i>authentication-protocols</i>]; chap { access-profile <i>name</i>; challenge-length minimum <i>minimum-length</i> maximum <i>maximum-length</i>; default-chap-secret <i>name</i>; local-name <i>name</i>; passive; } compression { acfc; pfc; } dynamic-profile <i>profile-name</i>; lcp-max-conf-req <i>number</i> lcp-restart-timer <i>milliseconds</i>; loopback-clear-timer <i>seconds</i>; ncp-max-conf-req <i>number</i> ncp-restart-timer <i>milliseconds</i>; on-demand-ip-address pap { access-profile <i>name</i>; default-pap-password <i>password</i>; local-name <i>name</i>; local-password <i>password</i>; passive; } } </pre>
Hierarchy Level	<pre> [edit interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>] </pre>

Release Information Statement introduced before Junos OS Release 7.4.

Description On interfaces with PPP encapsulation, configure PPP-specific interface properties.

For ATM2 IQ interfaces only, you can configure CHAP on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:

- **atm-ppp-llc**—PPP over AAL5 LLC encapsulation.
- **atm-ppp-vc-mux**—PPP over AAL5 multiplex encapsulation.




BEST PRACTICE: On inline service (si) interfaces for L2TP, only the **chap** and **pap** statements are typically used for subscriber management. We recommend that you leave the other statements subordinate to **ppp-options**—including those subordinate to **chap** and **pap**—at their default values.

The remaining statements are explained separately.

Required Privilege	interface—To view this statement in the configuration.
Level	interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the PPP Challenge Handshake Authentication Protocol</i>• <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

proxy-arp

Syntax	proxy-arp (restricted unrestricted);
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.6 for EX Series switches. restricted added in Junos OS Release 10.0 for EX Series switches. Statement introduced in Junos OS Release 12.2 for the QFX Series..
Description	For Ethernet interfaces only, configure the router or switch to respond to any ARP request, as long as the router or switch has an active route to the ARP request's target address.
<div>  <p>NOTE: You must configure the INET family and IP address of the interface when you enable proxy ARP.</p> </div>	
Default	Proxy ARP is not enabled. The router or switch responds to an ARP request only if the destination IP address is its own.
Options	<ul style="list-style-type: none"> • none—The router or switch responds to any ARP request for a local or remote address if the router or switch has a route to the target IP address. • restricted—(Optional) The router or switch responds to ARP requests in which the physical networks of the source and target are different and does not respond if the source and target IP addresses are in the same subnet. The router or switch must also have a route to the target IP address. • unrestricted—(Optional) The router or switch responds to any ARP request for a local or remote address if the router or switch has a route to the target IP address.
	Default: unrestricted
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Restricted and Unrestricted Proxy ARP</i> • <i>Configuring Proxy ARP (CLI Procedure)</i> • <i>Example: Configuring Proxy ARP on an EX Series Switch</i> • <i>Configuring Gratuitous ARP</i>

push

Syntax	<code>push;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i></code> <code>input-vlan-map],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i></code> <code>output-vlan-map]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>Specify the VLAN rewrite operation to add a new VLAN tag to the top of the VLAN stack. An outer VLAN tag is pushed in front of the existing VLAN tag.</p> <p>You can use this statement on Gigabit Ethernet IQ and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, aggregated Ethernet interfaces using Gigabit Ethernet IQ interfaces, and 100-Gigabit Ethernet Type 5 PIC with CFP.</p> <p>If you include the push statement in the configuration, you must also include the pop statement at the <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]</code> hierarchy level.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Stacking a VLAN Tag</i>

push-push

Syntax	push-push;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Specify the VLAN rewrite operation to push two VLAN tags in front of the frame. You can use this statement on Gigabit Ethernet IQ, IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, on aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs on MX Series routers, and 100-Gigabit Ethernet Type 5 PIC with CFP.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Stacking Two VLAN Tags</i>

queue-length

Syntax	<code>queue-length <i>number</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> shaping], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> shaping]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for the QFX Series.
Description	For ATM1 interfaces only, define the maximum queue length in the traffic-shaping profile. For ATM1 PICs, each VC has its own independent shaping parameters.
Default	Buffer usage is unregulated.
Options	<i>number</i> —Maximum number of packets the queue can contain. Range: 1 through 16,383 packets Default: 16,383 packets
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the ATM1 Queue Length</i>

queues

Syntax	<code>queues [<i>queue-numbers</i>];</code>
Hierarchy Level	[edit interfaces <i>vsp-fpc/pic/port</i> unit <i>logical-unit-number</i> compression rtp]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For voice services interfaces only, assign queue numbers for RTP traffic.
Options	queues <i>queue-numbers</i> —Assign one or more of the following queues: q0 , q1 , q2 , q3 . For VRRP services, specify the q3 option instead of q0 .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

redial-delay

Syntax	<code>redial-delay <i>time</i>;</code>
Hierarchy Level	[edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	<p>On J Series Services Routers with interfaces configured for ISDN with dialout, specify the delay (in seconds) between two successive calls made by the dialer. To configure callback mode, include the callback statement at the [edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p> <p>If the callback statement is configured, you cannot use the caller <i>caller-id</i> statement at the [edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p>
Options	<p>time—Delay (in seconds) between two successive calls.</p> <p>Range: 2 through 255 seconds</p> <p>Default: 3 seconds</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>ISDN Interfaces Overview</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i>

routing-instance

Syntax	<pre>routing-instance { destination <i>routing-instance-name</i>; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	To configure interfaces and logical-systems , specify the destination routing instance that points to the routing table containing the tunnel destination address.
Default	The default Internet routing table is inet.0 .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

rtp

Syntax	<pre>rtp { f-max-period <i>number</i>; queues [<i>queue-numbers</i>]; port { minimum <i>port-number</i>; maximum <i>port-number</i>; } }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> compression]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the real-time transport protocol (RTP) properties for voice services traffic. The remaining statements are described separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

rtvbr

Syntax	<code>rtvbr peak rate sustained rate burst length;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i> shaping],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> shaping],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> shaping],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping]</p>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For ATM2 IQ PICs only, define the real-time variable bandwidth utilization in the traffic-shaping profile.</p> <p>When you configure the real-time bandwidth utilization, you must specify all three options (burst, peak, and sustained). You can specify the rate in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation k (1000), m (1,000,000), or g (1,000,000,000). You can also specify the rate in cells per second by entering a decimal number followed by the abbreviation c; values expressed in cells per second are converted to bits per second using the formula 1 cps = 384 bps.</p>
Default	If the rtvbr statement is not included, bandwidth utilization is unlimited.
Options	<p>burst length—Burst length, in cells. If you set the length to 1, the peak traffic rate is used. Range: 1 through 4000 cells</p> <p>peak rate—Peak rate, in bits per second or cells per second. Range: For ATM2 IQ OC3 and OC12 interfaces, 33 Kbps through 542,526,792 bps. For ATM2 IQ OC48 interfaces, 33 Kbps through 2,170,107,168 bps. For ATM2 IQ DS3 and E3 interfaces, 33 Kbps through the maximum rate, which depends on the ATM encapsulation and framing you configure..</p> <p>sustained rate—Sustained rate, in bps or cps. Range: For ATM2 IQ OC3 and OC12 interfaces, 33 Kbps through 542,526,792 bps. For ATM2 IQ OC48 interfaces, 33 Kbps through 2,170,107,168 bps. For ATM2 IQ DS3 and E3 interfaces, from 33 Kbps through the maximum rate, which depends on the ATM encapsulation and framing you configure.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring ATM CBR</i> • <i>Configuring ATM2 IQ Real-Time VBR</i> • <i>Applying Scheduler Maps to Logical ATM Interfaces</i>

- [cbr on page 76](#)
- [vbr on page 176](#)

server

Syntax	server;
Hierarchy Level	[edit interfaces pp0 unit <i>logical-unit-number</i> pppoe-options], [edit logical-systems <i>logical-system-name</i> interfaces pp0 unit <i>logical-unit-number</i> pppoe-options]
Release Information	Statement introduced in Junos OS Release 8.5.
Description	Configure the router to operate in the PPPoE server mode. Supported on M120 and M320 Multiservice Edge Routers and MX Series Universal Edge Routers operating as access concentrators.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the PPPoE Server Mode</i>

service-domain

Syntax	service-domain (inside outside);
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For adaptive services interfaces, specify a service interface domain. If you specify this interface using the next-hop-service statement at the [edit services service-set <i>service-set-name</i>] hierarchy level, the interface domain must match that used with the inside-service-interface and outside-service-interface statements.
Options	inside —Interface used within the network. outside —Interface used outside the network.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

service-name

Syntax	<code>service-name name;</code>
Hierarchy Level	[edit interfaces pp0 unit <i>logical-unit-number</i> pppoe-options], [edit logical-systems <i>logical-system-name</i> interfaces pp0 unit <i>logical-unit-number</i> pppoe-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For J Series Services Routers with PPP over Ethernet interfaces, configure the service to be requested from the PPP over Ethernet server; that is, the access concentrator. For example, you can use this statement to indicate an Internet service provider (ISP) name or a class of service.
Options	name —Service to be requested from the PPP over Ethernet server.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the PPPoE Service Name</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

shaping

Syntax	<pre>shaping { (cbr rate rtvbr peak rate sustained rate burst length vbr peak rate sustained rate burst length); queue-length number; }</pre>
Hierarchy Level	<pre>[edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i>]</pre>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For ATM encapsulation only, define the traffic-shaping profile.</p> <p>For Circuit Emulation PICs, specify traffic shaping in the ingress and egress directions.</p> <p>For ATM2 IQ interfaces, changing or deleting VP tunnel traffic shaping causes all logical interfaces on a VP to be deleted and then re-added.</p> <p>VP tunnels are not supported on multipoint interfaces.</p> <p>The statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Defining Virtual Path Tunnels</i>• <i>Defining the ATM Traffic-Shaping Profile</i>• <i>Configuring ATM QoS or Shaping</i>• <i>Applying Scheduler Maps to Logical ATM Interfaces</i>

short-sequence

Syntax	short-sequence;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For multilink interfaces only, set the length of the packet sequence identification number to 12 bits.
Default	If you omit this statement from the configuration, the length is set to 24 bits.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

source

Syntax	source <i>source-address</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel <i>address</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel <i>address</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the source address of the tunnel.
Default	If you do not specify a source address, the tunnel uses the unit's primary address as the source address of the tunnel.
Options	<i>source-address</i> —Address of the local side of the tunnel. This is the address that is placed in the outer IP header's source field.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>multicast-only</i> • <i>primary (Address on Interface)</i> • <i>Junos OS Services Interfaces Library for Routing Devices</i>

swap

Syntax	swap;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>Specify the VLAN rewrite operation to replace a VLAN tag. The outer VLAN tag of the frame is overwritten with the user-specified VLAN tag information.</p> <p>On MX Series routers, you can enter this statement on Gigabit Ethernet IQ and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, aggregated Ethernet using Gigabit Ethernet IQ interfaces, and 100-Gigabit Ethernet Type 5 PIC with CFP.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Rewriting the VLAN Tag on Tagged Frames</i>

swap-push

Syntax	swap-push;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Specify the VLAN rewrite operation to replace the outer VLAN tag of the frame with 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. You can use this statement on Gigabit Ethernet IQ, IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, and for aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs on MX Series routers, and 100-Gigabit Ethernet Type 5 PIC with CFP.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Rewriting a VLAN Tag and Adding a New Tag</i>

swap-swap

Syntax	swap-swap;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]
Release Information	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>Specify the VLAN rewrite operation to replace both the inner and the outer VLAN tags of the frame with a user-specified VLAN tag value.</p> <p>You can use this statement on Gigabit Ethernet IQ, IQ2 and IQ2-E interfaces, 10-Gigabit Ethernet LAN/WAN PIC, for aggregated Ethernet interfaces using Gigabit Ethernet IQ2 and IQ2-E or 10-Gigabit Ethernet PICs on MX Series routers, and for 100-Gigabit Ethernet Type 5 PIC with CFP.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Rewriting the Inner and Outer VLAN Tags</i>

tag-protocol-id (TPID to Rewrite)

Syntax	<code>tag-protocol-id <i>tpid</i>;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>For Gigabit Ethernet IQ and 10-Gigabit Ethernet IQ2 and IQ2-E interfaces only, configure the outer TPID value. All TPIDs you include in input and output VLAN maps must be among those you specify at the [edit interfaces <i>interface-name</i> gigether-options ethernet-switch-profile tag-protocol-id [<i>tpids</i>]] hierarchy level.</p> <p>For 10-Gigabit Ethernet LAN/WAN PIC interfaces on T Series routers the default TPID value (0x8100) is supported.</p>
Default	If the tag-protocol-id statement is not configured, the TPID value is 0x8100.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Inner and Outer TPIDs and VLAN IDs</i>

transmit-weight (ATM2 IQ Virtual Circuit)

Syntax	<code>transmit-weight <i>number</i>;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For ATM2 IQ PICs only, configure the transmission weight.</p> <p>Each VC is serviced in weighted round robin (WRR) mode. When VCs have data to send, they send the number of cells equal to their weight before passing control to the next active VC. This allows proportional bandwidth sharing between multiple VCs within a rate-shaped VP tunnel. VP tunnels are not supported on multipoint interfaces.</p>
Options	<p><i>number</i>—Number of cells a VC sends before passing control to the next active VC within a VP tunnel.</p> <p>Range: 1 through 32,767</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the ATM2 IQ Transmission Weight</i>

traps

Syntax	<code>(traps no-traps);</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i>],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</code> <code>[edit interfaces <i>interface-range</i> <i>name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</code>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p>
Description	Enable or disable the sending of Simple Network Management Protocol (SNMP) notifications when the state of the connection changes.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Enabling or Disabling SNMP Notifications on Physical Interfaces</i>• Enabling or Disabling SNMP Notifications on Logical Interfaces on page 19

trunk-bandwidth

Syntax	<code>trunk-bandwidth rate;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For ATM2 IQ interfaces configured to use Layer 2 circuit trunk mode, configure a scheduler so that unused bandwidth from any inactive trunk is proportionally shared among the active trunks.</p> <p>During congestion, each trunk receives a proportional share of the leftover bandwidth, thus minimizing the latency on each trunk.</p>
Options	<p>rate—Peak rate, in bits per second (bps) or cells per second (cps). You can specify a value in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation k (1000), m (1,000,000), or g (1,000,000,000). You can also specify a value in cells per second by entering a decimal number followed by the abbreviation c; values expressed in cells per second are converted to bits per second by means of the formula 1 cps = 384 bps.</p> <p>Range: 1,000,000 through 542,526,792 bps</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Configuring Layer 2 Circuit Trunk Mode Scheduling</i>

trunk-id

Syntax	<code>trunk-id number;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For ATM2 IQ interfaces with ATM CCC cell-relay encapsulation, configure the trunk identification number.</p> <p>When you associate a trunk ID number with a logical interface, you are in effect specifying the interfaces that are allowed to send ATM traffic over an LSP.</p>
Options	<p>number—A valid trunk identifier.</p> <p>Range: For UNI mode, 0 through 7. For NNI mode, 0 through 31.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Layer 2 Circuit Transport Mode</i>


ttl

Syntax	<code>ttl value;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>number</i> tunnel]
Release Information	Statement introduced before Junos OS Release 7.4
Description	Set the time-to-live value bit in the header of the outer IP packet.
Options	<p>value—Time-to-live value.</p> <p>Range: 0 through 255</p> <p>Default: 64</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>

tunnel

Syntax	<pre> tunnel { backup-destination address; destination address; key number; routing-instance { destination routing-instance-name; } source source-address; ttl number; } </pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Configure a tunnel. You can use the tunnel for unicast and multicast traffic or just for multicast traffic. You can also use tunnels for encrypted traffic or VPNs.</p> <p>The statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Services Interfaces Library for Routing Devices</i> • <i>Junos OS VPNs Library for Routing Devices</i>

underlying-interface

Syntax	<code>underlying-interface <i>interface-name</i>;</code>
Hierarchy Level	<p>[edit interfaces pp0 unit <i>logical-unit-number</i> pppoe-options],</p> <p>[edit interfaces demux0 unit <i>logical-unit-number</i> demux-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces demux0 unit <i>logical-unit-number</i> demux-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces pp0 unit <i>logical-unit-number</i> pppoe-options],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> interfaces demux0 unit <i>logical-unit-number</i> demux-options],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> interfaces pp0 unit <i>logical-unit-number</i> pppoe-options]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Support for aggregated Ethernet added in Junos OS Release 9.4.</p>
Description	<p>For J Series Services Routers, M120 and M320 Multiservice Edge routers, and MX Series Universal Edge Routers with PPP over Ethernet interfaces, configure the interface on which PPP over Ethernet is running.</p> <p>For demux interfaces, configure the underlying interface on which the demultiplexing (demux) interface is running.</p>
Options	<p><i>interface-name</i>—Name of the interface on which PPP over Ethernet or demux is running. For example, at-0/0/1.0 (ATM VC), fe-1/0/1.0 (Fast Ethernet interface), ge-2/0/0.0 (Gigabit Ethernet interface), ae1.0 (for IP demux on an aggregated Ethernet interface), or ae1 (for VLAN demux on an aggregated Ethernet interface).</p>
<div>  <p>NOTE: Demux interfaces are currently supported on Gigabit Ethernet, Fast Ethernet, 10-Gigabit Ethernet interfaces, or aggregated Ethernet devices.</p> </div>	
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring an IP Demux Underlying Interface</i> • <i>Configuring a VLAN Demux Underlying Interface</i> • <i>Specifying the Demux Underlying Interface</i> • <i>Configuring the PPPoE Underlying Interface</i> • <i>Junos OS Interfaces and Routing Configuration Guide</i>

unit

```

Syntax  unit logical-unit-number {
        accept-source-mac {
            mac-address mac-address {
                policer {
                    input cos-policer-name;
                    output cos-policer-name;
                }
            }
        }
        accounting-profile name;
        advisory-options {
            downstream-rate rate;
            upstream-rate rate;
        }
        allow-any-vci;
        atm-scheduler-map (map-name | default);
        backup-options {
            interface interface-name;
        }
        bandwidth rate;
        cell-bundle-size cells;
        clear-dont-fragment-bit;
        compression {
            rtp {
                maximum-contexts number <force>;
                f-max-period number;
                queues [ queue-numbers ];
                port {
                    minimum port-number;
                    maximum port-number;
                }
            }
        }
        compression-device interface-name;
        copy-tos-to-outer-ip-header;
        demux-destination family;
        demux-source family;
        demux-options {
            underlying-interface interface-name;
        }
        description text;
        interface {
            l2tp-interface-id name;
            (dedicated | shared);
        }
        dialer-options {
            activation-delay seconds;
            callback;
            callback-wait-period time;
            deactivation-delay seconds;
            dial-string [ dial-string-numbers ];
            idle-timeout seconds;

```

```
incoming-map {
  caller caller-id) | accept-all;
  initial-route-check seconds;
  load-interval seconds;
  load-threshold percent;
  pool pool-name;
  redial-delay time;
  watch-list {
    [ routes ];
  }
}
}
disable;
disable-mlppp-inner-ppp-pfc;
dlci dlci-identifier;
drop-timeout milliseconds;
dynamic-call-admission-control {
  activation-priority priority;
  bearer-bandwidth-limit kilobits-per-second;
}
encapsulation type;
epd-threshold cells plp1 cells;
family family-name {
  ... the family subhierarchy appears after the main [edit interfaces interface-name unit
    logical-unit-number] hierarchy ...
}
fragment-threshold bytes;
inner-vlan-id-range start start-id end end-id;
input-vlan-map {
  (pop | pop-pop | pop-swap | push | push-push | swap |
  swap-push | swap-swap);
  inner-tag-protocol-id tpid;
  inner-vlan-id number;
  tag-protocol-id tpid;
  vlan-id number;
}
interleave-fragments;
inverse-arp;
layer2-policer {
  input-policer policer-name;
  input-three-color policer-name;
  output-policer policer-name;
  output-three-color policer-name;
}
link-layer-overhead percent;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
  up-count cells;
  down-count cells;
}
oam-period (disable | seconds);
```

```

output-vlan-map {
    (pop | pop-pop | pop-swap | push | push-push | swap |
    swap-push | swap-swap);
    inner-tag-protocol-id tpid;
    inner-vlan-id number;
    tag-protocol-id tpid;
    vlan-id number;
}
passive-monitor-mode;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
    chap {
        access-profile name;
        default-chap-secret name;
        local-name name;
        passive;
    }
    compression {
        acfc;
        pfc;
    }
    dynamic-profile profile-name;
    lcp-restart-timer milliseconds;
    loopback-clear-timer seconds;
    ncp-restart-timer milliseconds;
    pap {
        access-profile name;
        default-pap-password password;
        local-name name;
        local-password password;
        passive;
    }
}
pppoe-options {
    access-concentrator name;
    auto-reconnect seconds;
    (client | server);
    service-name name;
    underlying-interface interface-name;
}
pppoe-underlying-options {
    access-concentrator name;
    dynamic-profile profile-name;
    max-sessions number;
}
proxy-arp;
service-domain (inside | outside);
shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained rate burst
    length);
    queue-length number;
}
short-sequence;
targeted-distribution;

```

```
transmit-weight number;  
(traps | no-traps);  
trunk-bandwidth rate;  
trunk-id number;  
tunnel {  
    backup-destination address;  
    destination address;  
    key number;  
    routing-instance {  
        destination routing-instance-name;  
    }  
    source source-address;  
    ttl number;  
}  
vci vpi-identifier.vci-identifier;  
vci-range start start-vci end end-vci;  
vpi vpi-identifier;  
vlan-id number;  
vlan-id-range number-number;  
vlan-tags inner tpid.vlan-id outer tpid.vlan-id;  
family family {  
    accounting {  
        destination-class-usage;  
        source-class-usage {  
            (input | output | input output);  
        }  
    }  
    access-concentrator name;  
    address address {  
        ... the address subhierarchy appears after the main [edit interfaces interface-name unit  
            logical-unit-number family family-name] hierarchy ...  
    }  
    bridge-domain-type (bvlan | svlan);  
    bundle interface-name;  
    core-facing;  
    demux-destination {  
        destination-prefix;  
    }  
    demux-source {  
        source-prefix;  
    }  
    duplicate-protection;  
    dynamic-profile profile-name;  
    filter {  
        group filter-group-number;  
        input filter-name;  
        input-list [ filter-names ];  
        output filter-name;  
        output-list [ filter-names ];  
    }  
    interface-mode (access | trunk);  
    ipsec-sa sa-name;  
    isid-list all-service-groups;  
    keep-address-and-control;  
    mac-validate (loose | strict);  
    max-sessions number;
```

```

mtu bytes;
multicast-only;
no-redirects;
policer {
    arp policer-template-name;
    input policer-template-name;
    output policer-template-name;
}
primary;
protocols [inet iso mpls];
proxy inet-address address;
receive-options-packets;
receive-ttl-exceeded;
remote (inet-address address | mac-address address);
rpf-check {
    fail-filter filter-name
    mode loose;
}
sampling {
    input;
    output;
}
service {
    input {
        post-service-filter filter-name;
        service-set service-set-name <service-filter filter-name>;
    }
    output {
        service-set service-set-name <service-filter filter-name>;
    }
}
service-name-table table-name
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
translate-plp-control-word-de;
unnumbered-address interface-name destination address destination-profile profile-name;
vlan-id number;
vlan-id-list [number number-number];
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast address;
    destination address;
    destination-profile name;
    eui-64;
    master-only;
    multipoint-destination address {
        dlci dlci-identifier;
        epd-threshold cells <plp1 cells>;
        inverse-arp;
        oam-liveness {
            up-count cells;
            down-count cells;
        }
        oam-period (disable | seconds);
        shaping {

```

```

        (cbr rate | rtvbr burst length peak rate sustained rate | vbr burst length peak rate
         sustained rate);
        queue-length number;
    }
    vci vpi-identifier.vci-identifier;
}
preferred;
primary;
(vrrp-group | vrrp-inet6-group) group-number {
    (accept-data | no-accept-data);
    advertise-interval seconds;
    authentication-type authentication;
    authentication-key key;
    fast-interval milliseconds;
    (preempt | no-preempt) {
        hold-time seconds;
    }
    priority number;
    track {
        interface interface-name {
            bandwidth-threshold bits-per-second priority-cost number;
        }
        priority-hold-time seconds;
        route ip-address/prefix-length routing-instance instance-name priority-cost cost;
    }
    virtual-address [ addresses ];
    virtual-link-local-address ipv6-address;
    vrrp-inherit-from {
        active-interface interface-name;
        active-group group-number;
    }
}
}
}
}

```

Hierarchy Level [edit interfaces *interface-name*],
 [edit logical-systems *logical-system-name* interfaces *interface-name*],
 [edit interfaces interface-set *interface-set-name* interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure a logical interface on the physical device. You must configure a logical interface to be able to use the physical device.

Options *logical-unit-number*—Number of the logical unit.

Range: 0 through 1,073,741,823 for demux and PPPoE static interfaces only. 0 through 16,385 for all other static interface types.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

- Related Documentation**
- *Configuring Logical Interface Properties*
 - *Example: Configuring E-LINE and E-LAN Services for a PBB Network on MX Series Routers*
 - *Junos OS Services Interfaces Library for Routing Devices*

vbr

Syntax	<code>vbr peak <i>rate</i> sustained <i>rate</i> burst <i>length</i>;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> atm-options vpi <i>vpi-identifier</i> shaping],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> shaping],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> address <i>address</i> family <i>family</i> multipoint-destination <i>address</i> shaping],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> shaping]</p>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For ATM encapsulation only, define the variable bandwidth utilization in the traffic-shaping profile.</p> <p>When you configure the variable bandwidth utilization, you must specify all three options (burst, peak, and sustained). You can specify the rate in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation k (1000), m (1,000,000), or g (1,000,000,000). You can also specify the rate in cells per second by entering a decimal number followed by the abbreviation c; values expressed in cells per second are converted to bits per second by means of the formula 1 cps = 384 bps.</p>
Default	If the vbr statement is not specified, bandwidth utilization is unlimited.
Options	<p>burst <i>length</i>—Burst length, in cells. If you set the length to 1, the peak traffic rate is used. Range: 1 through 4000 cells</p> <p>peak <i>rate</i>—Peak rate, in bits per second or cells per second. Range: For ATM1 interfaces, 33 Kbps through 135.6 Mbps (ATM OC3); 33 Kbps through 276 Mbps (ATM OC12). For ATM2 IQ OC3 and OC12 interfaces, 33 Kbps through 542,526,792 bps. For ATM2 IQ OC48 interfaces, 33 Kbps through 2,170,107,168 bps. For ATM2 IQ DS3 and E3 interfaces, from 33 Kbps through the maximum rate, which depends on the ATM encapsulation and framing you configure.</p> <p>sustained <i>rate</i>—Sustained rate, in bits per second or cells per second. Range: For ATM1 interfaces, 33 Kbps through 135.6 Mbps (ATM OC3); 33 Kbps through 276 Mbps (ATM OC12). For ATM2 IQ OC3 and OC12 interfaces, 33 Kbps through 542,526,792 bps. For ATM2 IQ OC48 interfaces, 33 Kbps through 2,170,107,168 bps. For ATM2 IQ DS3 and E3 interfaces, from 33 Kbps through the maximum rate, which depends on the ATM encapsulation and framing you configure.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring ATM CBR Applying Scheduler Maps to Logical ATM Interfaces

- [cbr on page 76](#)
- [rtvbr on page 155](#)
- [shaping on page 158](#)

vci

Syntax	<code>vci vpi-identifier.vci-identifier;</code>
Hierarchy Level	<p>[edit interfaces at-<i>fpc/pic/port</i> unit <i>logical-unit-number</i>],</p> <p>[edit interfaces at-<i>fpc/pic/port</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i> multipoint-destination <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces at-<i>fpc/pic/port</i> unit <i>logical-unit-number</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces at-<i>fpc/pic/port</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i> multipoint-destination <i>address</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access routers.</p>
Description	<p>For ATM point-to-point logical interfaces only, configure the virtual circuit identifier (VCI) and virtual path identifier (VPI).</p> <p>To configure a VPI for a point-to-multipoint interface, specify the VPI in the <i>multipoint-destination</i> statement.</p> <p>VCIs 0 through 31 are reserved for specific ATM values designated by the ATM Forum.</p>
Options	<p>vci-identifier—ATM virtual circuit identifier. Unless you configure the interface to use promiscuous mode, this value cannot exceed the highest-numbered VC configured for the interface with the maximum-vcs option of the vpi statement.</p> <p>Range: 0 through 4089 or 0 through 65,535 with promiscuous mode, with VCIs 0 through 31 reserved.</p> <p>vpi-identifier—ATM virtual path identifier.</p> <p>Range: 0 through 255</p> <p>Default: 0</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring a Point-to-Point ATM1 or ATM2 IQ Connection • Applying Scheduler Maps to Logical ATM Interfaces • multipoint-destination • promiscuous-mode • vpi (ATM CCC Cell-Relay Promiscuous Mode)

vci-range

Syntax	<code>vci-range start <i>start-vci</i> end <i>end-vci</i>;</code>
Hierarchy Level	[edit interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces at- <i>fpc/pic/port</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Range of VCI values used in ATM-to-Ethernet interworking cross-connects. VCI 0 through 31 are reserved. VCI 0 through 31 should not be used.
Options	<i>start-vci</i> —Lowest number VCI in the range. <i>end-vci</i> —Highest number VCI in the range. Range: 0 through 255
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring ATM-to-Ethernet Interworking</i>

vlan-id (VLAN ID to Rewrite)

Syntax	<code>vlan-id number;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> input-vlan-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>For Gigabit Ethernet IQ and 10-Gigabit Ethernet IQ2, 10-Gigabit Ethernet LAN/WAN PIC, and IQ2-E interfaces and aggregated Ethernet using Gigabit Ethernet IQ interfaces, specify the line VLAN identifiers to be rewritten at the input or output interface.</p> <p>You cannot include the vlan-id statement with the swap statement, swap-push statement, push-push statement, or push-swap statement at the [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> output-vlan-map] hierarchy level. If you include any of those statements in the output VLAN map, the VLAN ID in the outgoing frame is rewritten to the vlan-id statement that you include at the [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>] hierarchy level.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Rewriting the VLAN Tag on Tagged Frames</i> • <i>Binding VLAN IDs to Logical Interfaces</i>

vlan-id-range

Syntax	<code>vlan-id-range <i>vlan-id-vlan-id</i></code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 8.4.
Description	Bind a range of VLAN IDs to a logical interface.
Options	number —The first number is the lowest VLAN ID in the range the second number is the highest VLAN ID in the range. Range: 1 through 4094



NOTE: Configuring `vlan-id-range` with the entire `vlan-id` range is an unnecessary waste of system resources and is not best practice. It should be used only when a subset of VLAN IDs (not the entire range) needs to be associated with a logical interface. If you specify the entire range (1-4094), it has the same result as not specifying a range; however, it consumes PFE resources such as VLAN lookup tables entries, and so on.

The following examples illustrate this further:

```
[edit interfaces interface-name]  
vlan-tagging;  
unit number {  
    vlan-id-range 1-4094;  
}  
  
[edit interfaces interface-name]  
unit 0;
```

VLAN ID 0 is reserved for tagging the priority of frames.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Binding a Range of VLAN IDs to a Logical Interface</i>

vlan-tags (Stacked VLAN Tags)

Syntax	<code>vlan-tags inner <i>tpid.vlan-id</i> inner-range <i>vid1—vid2</i> outer <i>tpid.vlan-id</i>;</code>
Hierarchy Level	<code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
Description	For Gigabit Ethernet IQ and IQE interfaces only, bind TPIDs and 802.1Q VLAN tag IDs to a logical interface.



NOTE: The inner-range *vid1—vid2* option is supported on MX Series with IQE PICs only.

Options	<p>inner <i>tpid.vlan-id</i>—A TPID and a valid VLAN identifier.</p> <p>Range: (most routers) For VLAN ID, 1 through 4094. VLAN ID 0 is reserved for tagging the priority of frames.</p> <p>Range: (PTX Series) For VLAN ID, 0 through 4094.</p> <p>inner-range <i>vid1—vid2</i>—For MX Series routers with Enhanced IQ (IQE) PICs only; specify a range of VLAN IDs where <i>vid1</i> is the start of the range and <i>vid2</i> is the end of the range.</p> <p>Range: For VLAN ID, 1 through 4094. VLAN ID 0 is reserved for tagging the priority of frames.</p> <p>outer <i>tpid.vlan-id</i>—A TPID and a valid VLAN identifier.</p> <p>Range: (most routers) For VLAN ID, 1 through 511 for normal interfaces, and 512 through 4094 for VLAN CCC interfaces. VLAN ID 0 is reserved for tagging the priority of frames.</p> <p>Range: (PTX Series) For VLAN ID, 0 through 511 for normal interfaces, and 512 through 4094 for VLAN CCC interfaces.</p>
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NOTE: Configuring inner-range with the entire *vlan-id* range consumes system resources and is not a best practice. It should be used only when a subset of VLAN IDs of inner tag (not the entire range) needs to be associated with a logical interface. If you specify the entire range (1–4094), it has the same result as not specifying a range; however, it consumes Packet Forwarding Engine resources such as VLAN lookup table entries, and so on.

The following examples illustrate this further:

```
[edit interfaces interface-name]
```

```
stacked-vlan-tagging;
unit number {
    vlan-tags outer vid inner-range 1-4094;
}

[edit interfaces interface-name]
vlan-tagging;
unit number {
    vlan-id vid;
}
```

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Dual VLAN Tags*
- *Configuring Flexible VLAN Tagging on PTX Series Packet Transport Routers*
- *stacked-vlan-tagging*

vpi (Logical Interface and Interworking)

Syntax vpi *virtual-path-identifier*;

Hierarchy Level [edit interfaces at-*fpc/pic/port* **unit** *logical-unit-number*],
[edit logical-systems *logical-system-name* interfaces at-*fpc/pic/port* **unit** *logical-unit-number*]

Release Information Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access routers.

Description VPI used in an ATM-to-Ethernet interworking cross-connect.

Options **virtual-path-identifier**—VPI to be used.
Range: 0 through 255

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring ATM-to-Ethernet Interworking*
- *Configuring ATM Cell-Relay Promiscuous Mode*

watch-list

Syntax	<code>watch-list { [<i>routes</i>]; }</code>
Hierarchy Level	[edit interfaces <i>dl</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure an ISDN list of routes to watch. Used only for dialer watch.
Options	routes —IP prefix of a route. Specify one or more. The primary interface is considered up if there is at least one valid route for any of the addresses in the watch list to an interface other than the backup interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Dialer Watch</i>• <i>Junos OS Interfaces and Routing Configuration Guide</i>

PART 3

Administration

- [Monitoring Commands on page 187](#)
- [Command Summary on page 521](#)

CHAPTER 5

Monitoring Commands

show interfaces (10-Gigabit Ethernet)

Syntax	<code>show interfaces <i>xe-fpc/pic/port</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 in Junos OS Release 8.0.
Description	(M320, M120, MX Series, and T Series routers and EX Series switches only) Display status information about the specified 10-Gigabit Ethernet interface.
Options	<p><code><i>xe-fpc/pic/port</i></code>—Display standard information about the specified 10-Gigabit Ethernet 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>
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, DWDM OTN PIC) on page 208</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode) on page 210</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Transmit-Only) on page 210</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Receive-Only) on page 211</p>
Output Fields	See Table 4 on page 189 for the output fields for the show interfaces (10-Gigabit Ethernet) command.

Table 4: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels

Table 4: 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 <i>Common Output Fields Description</i> .	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). The value in this field also includes the Layer 2 overhead bytes for ingress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level.	None specified	
Output Rate	Output rate in bps and pps. The value in this field also includes the Layer 2 overhead bytes for egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level.	None specified	
Statistics last cleared	Time when the statistics for the interface were last set to zero.	detail extensive	
Egress accounting overhead	Layer 2 overhead in bytes that is accounted in the interface statistics for egress traffic.	detail extensive	
Ingress accounting overhead	Layer 2 overhead in bytes that is accounted in the interface statistics for ingress traffic.	detail extensive	detail extensive

Table 4: show interfaces Gigabit Ethernet 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. The value in this field also includes the Layer 2 overhead bytes for ingress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • Output bytes—Number of bytes transmitted on the interface. The value in this field also includes the Layer 2 overhead bytes for egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • 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 4 on page 189.</p>	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. • 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 4: 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 4: 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 routing device configuration, an alarm can ring the red or yellow alarm bell on the routing device, 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 alarms	Active OTN alarms identified on the interface.	detail extensive
OTN defects	OTN defects received on the interface.	detail extensive
OTN FEC Mode	<p>The FECmode configured on the interface.</p> <ul style="list-style-type: none"> • efec—Enhanced forward error correction (EFEC) is configured to detect and correct bit errors. • gfec—G.709 Forward error correction (GFEC) mode is configured to detect and correct bit errors. • none—FEC mode is not configured. 	detail extensive
OTN Rate	<p>OTN mode.</p> <ul style="list-style-type: none"> • fixed-stuff-bytes—Fixed stuff bytes 11.0957 Gbps. • no-fixed-stuff-bytes—No fixed stuff bytes 11.0491 Gbps. • pass-through—Enable OTN passthrough mode. • no-pass-through—Do not enable OTN passthrough mode. 	detail extensive
OTN Line Loopback	Status of the line loopback, if configured for the DWDM OTN PIC. Its value can be: enabled or disabled .	detail extensive
OTN FEC statistics	<p>The forward error correction (FEC) counters for the DWDM OTN PIC.</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. 	detail extensive
OTN FEC alarms	<p>OTN FEC excessive or degraded error alarms triggered on the interface.</p> <ul style="list-style-type: none"> • FEC Degrade—OTU FEC Degrade defect. • FEC Excessive—OTU FEC Excessive Error defect. 	detail extensive
OTN OC	<p>OTN OC defects triggered on the interface.</p> <ul style="list-style-type: none"> • LOS—OC Loss of Signal defect. • LOF—OC Loss of Frame defect. • LOM—OC Loss of Multiframe defect. • Wavelength Lock—OC Wavelength Lock defect. 	detail extensive

Table 4: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
OTN OTU	OTN OTU defects detected on the interface <ul style="list-style-type: none"> • AIS—OTN AIS alarm. • BDI—OTN OTU BDI alarm. • IAE—OTN OTU IAE alarm. • TTIM—OTN OTU TTIM alarm. • SF—OTN ODU bit error rate fault alarm. • SD—OTN ODU bit error rate defect alarm. • TCA-ES—OTN ODU ES threshold alarm. • TCA-SES—OTN ODU SES threshold alarm. • TCA-UAS—OTN ODU UAS threshold alarm. • TCA-BBE—OTN ODU BBE threshold alarm. • BIP—OTN ODU BIP threshold alarm. • BBE—OTN OTU BBE threshold alarm. • ES—OTN OTU ES threshold alarm. • SES—OTN OTU SES threshold alarm. • UAS—OTN OTU UAS threshold alarm. 	detail extensive
Received DAPI	Destination Access Port Interface (DAPI) from which the packets were received.	detail extensive
Received SAPI	Source Access Port Interface (SAPI) from which the packets were received.	detail extensive
Transmitted DAPI	Destination Access Port Interface (DAPI) to which the packets were transmitted.	detail extensive
Transmitted SAPI	Source Access Port Interface (SAPI) to which the packets were transmitted.	detail extensive
PCS statistics	(10-Gigabit Ethernet interfaces) Displays Physical Coding Sublayer (PCS) fault conditions from the WAN PHY or the LAN PHY device. <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 4: 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 5 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 4: 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 routing device 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 routing device (which the routing device 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 4: 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 4: 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 4: 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 routing device at the other end of the fiber. The transmitted path trace value is the message that this routing device 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 4: show interfaces Gigabit 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 <i>Common Output Fields Description</i> .	All levels

Table 4: 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 <i>Common Output Fields Description</i> .	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. The value in this field also includes the Layer 2 overhead bytes for ingress or egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • 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 routing device.	extensive

Table 4: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 4: 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 5 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 5 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 5: 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	

Sample Output

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, Runt: 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          Seconds
  Bit errors              0
  Errored blocks          0

```

```

MAC statistics:
Total octets          6970332384
Total packets        81050506
Unicast packets      81050000
Broadcast packets    506
Multicast packets    0
CRC/Align errors     0
FIFO errors          0
MAC control frames   0
MAC pause frames     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
Egress accounting overhead: 100
Ingress accounting overhead: 90

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
Output bytes : 0

```

```

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:
  Seconds      Count  State
  PLL lock     0      0 OK
  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, DWDM OTN PIC)

```

user@host> show interfaces ge-7/0/0 extensive
Physical interface: ge-7/0/0, Enabled, Physical link is Down
Interface index: 143, SNMP ifIndex: 508, Generation: 208
Link-level type: Ethernet, MTU: 1514, Speed: 10Gbps, 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
Wavelength     : 1550.12 nm, Frequency: 193.40 THz
CoS queues     : 8 supported, 8 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:70:2b:72, Hardware address: 00:05:85:70:2b:72
Last flapped   : 2011-04-20 15:48:54 PDT (18:39:49 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
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: 2, 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
Queue number:      Mapped forwarding classes
  0                best-effort
  1                expedited-forwarding
  2                assured-forwarding
  3                network-control
Active alarms  : LINK
Active defects : LINK
MAC statistics:
Total octets      Receive      Transmit
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
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
OTN alarms                     :   None
OTN defects                    :   None
OTN FEC Mode                   :  GFEC
OTN Rate                       :  Fixed Stuff Bytes 11.0957Gbps
OTN Line Loopback              :  Enabled
OTN FEC statistics :
  Corrected Errors              0
  Corrected Error Ratio (      0 sec average)  0e-0
OTN FEC alarms:                Seconds    Count  State
  FEC Degrade                   0          0   OK
  FEC Excessive                  0          0   OK
OTN OC:                        Seconds    Count  State
  LOS                           2          1   OK
  LOF                           67164      2  Defect Active
  LOM                           67164      71  Defect Active
  Wavelength Lock                0          0   OK
OTN OTU:
  AIS                           0          0   OK
  BDI                           65919     4814  Defect Active
  IAE                           67158      1  Defect Active
  TTIM                          7          1   OK
  SF                            67164      2  Defect Active
  SD                            67164      3  Defect Active
  TCA-ES                        0          0   OK
  TCA-SES                       0          0   OK
  TCA-UAS                       80         40   OK
  TCA-BBE                       0          0   OK
  BIP                           0          0   OK
  BBE                           0          0   OK
  ES                            0          0   OK
  SES                           0          0   OK
  UAS                           587         0   OK
Received DAPI:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Received SAPI:

```

```

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted DAPI:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted SAPI:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
OTN Received Overhead Bytes:
  APS/PCC0: 0x02, APS/PCC1: 0x42, APS/PCC2: 0xa2, APS/PCC3: 0x48
  Payload Type: 0x03
OTN Transmitted Overhead Bytes:
  APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00
  Payload Type: 0x03
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
Packet Forwarding Engine configuration:
  Destination slot: 7
CoS information:
  Direction : Output
  CoS transmit queue      Bandwidth      Buffer Priority
Limit
      0 best-effort        95      9500000000    95      0      low
none
      3 network-control    5       500000000     5      0      low
none
...

```

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
Egress accounting overhead: 100
Ingress accounting overhead: 90
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 (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>at-<i>fpc/pic/port</i>—Display standard information about the specified ATM interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display the SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces (ATM, IMA Group) on page 228</p> <p>show interfaces extensive (ATM IMA Group) on page 229</p> <p>show interfaces (ATM1, SONET Mode) on page 230</p> <p>show interfaces brief (ATM1, SONET Mode) on page 231</p> <p>show interfaces detail (ATM1, SONET Mode) on page 231</p> <p>show interfaces extensive (ATM1, SONET Mode) on page 232</p> <p>show interfaces (ATM2, SDH Mode) on page 234</p> <p>show interfaces brief (ATM2, SDH Mode) on page 235</p> <p>show interfaces detail (ATM2, SDH Mode) on page 236</p> <p>show interfaces extensive (ATM2, SDH Mode) on page 237</p> <p>show interfaces (ATM2, SONET Mode) on page 240</p> <p>show interfaces brief (ATM2, SONET Mode) on page 241</p> <p>show interfaces detail (ATM2, SONET Mode) on page 242</p> <p>show interfaces extensive (ATM2, SONET Mode) on page 244</p>
Output Fields	Table 6 on page 213 lists the output fields for the show interfaces (ATM) command. Output fields are listed in the approximate order in which they appear.

Table 6: ATM show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		

Table 6: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Physical interface	Name of the physical interface.	All levels
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels

Table 6: 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 <i>Common Output Fields Description</i> .	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 6: 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 6: 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 6: 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 (signal) 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 6: 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 6: 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. This byte is 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. This byte is 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—These bytes are 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 6: 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

Table 6: ATM show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
ATM Statistics	<p>ATM statistics for the interface:</p> <ul style="list-style-type: none"> • Uncorrectable HCS errors—Number of cells dropped because the cell delineation failed. These errors most likely indicate that a SONET/SDH layer problem has occurred. • Correctable HCS errors—Number of correctable HCS errors that occurred. The cell delineation process can recover from these errors and locate the ATM cell boundary, although the framing process is not quite stable. The ATM cell is not dropped. This counter increases when the cell delineation process changes its state from present to sync (for example, when a cable is plugged into the interface). <p>The following error statistics are from the framer:</p> <ul style="list-style-type: none"> • Tx cell FIFO overruns—Number of overruns in the transmit FIFO. • Rx cell FIFO overruns—Number of overruns in the receive FIFO. • Rx cell FIFO underruns—Number of underruns in the receive FIFO. • Input cell count—Number of ATM cells received by the interface (not including idle cells). • Output cell count—Number of ATM cells transmitted by the interface (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. • Denied packets count—The number of packets dropped due to VLAN priority deny packets or due to an error forwarding configuration that might cause a negative frame length, that is, the stripping size is larger than the packet size. 	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 6: ATM show interfaces 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

Table 6: 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 OAM F4 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 6: 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 <i>Common Output Fields Description</i> .	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 a while (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 a while (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 a while (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 <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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 6: ATM 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
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: hh:mm:ss or Never. • Last down—Time of last Down transition, using the format Last down: hh:mm:ss. • EPD threshold—(ATM2 only) Threshold at which a packet is dropped when the queue size (in number of cells) exceeds the early packet-discard (EPD) value. 	All levels

Table 6: 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. This value 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 OAM F4 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—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. • Receive—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 6: 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	<p>IMA group media status, including seconds, count and state for the following media parameters:</p> <ul style="list-style-type: none"> • FC • FC-FE • Addr-Mismatch • Running • UAS 	detail extensive none

Sample Output

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 extensive (ATM IMA Group)

```

user@host> show interfaces at-0/0/10 extensive
Physical interface: at-0/0/10, Enabled, Physical link is Up
  Interface index: 178, SNMP ifIndex: 540, Generation: 531
  Link-level type: ATM-PVC, MTU: 2048, Speed: Unspecified, Loopback: None, Payload
  scrambler: Enabled
  Device flags   : Present Running
  Link flags     : None
  CoS queues     : 8 supported, 4 maximum usable queues
  Hold-times    : Up 0 ms, Down 0 ms
  Current address: 84:18:88:c0:33:0a
  Last flapped  : 2012-03-16 16:49:15 PDT (2d 07:12 ago)
  Statistics last cleared: 2012-03-16 16:56:58 PDT (2d 07:05 ago)
  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, 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
  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
    Link #1          : t1-0/0/4          up
  IMA Group alarms   : None
  IMA Group defects  : None

  IMA Group state:
    Near end : Operational
    Far end  : Operational
  IMA group media:
    Seconds      Count  State
    FC           0
    FC-FE        0
    Addr-Mismatch 0
    Running      198306
    UAS          0
  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 2
  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-0/0/10.602 (Index 71) (SNMP ifIndex 1057) (Generation
17226)
  Flags: Point-To-Point SNMP-Traps CCC-Down 0x0 Encapsulation:
ATM-CCC-Cell-Relay
  L2 circuit cell bundle size: 1, bundle timeout: 125 usec, timeout count: 0
  L2 circuit out-of-sequence count: 0, denied packets count: 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, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags : Present Running
Link flags   : None
CoS queues   : 4 supported, 4 maximum usable queues
Hold-times   : Up 0 ms, Down 0 ms
Current address: 00:05:85:02:38:7e
Last flapped : 2006-02-24 14:28:12 PST (6d 01:56 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :                  0          0 bps
Output bytes :                 0          0 bps
Input packets:                 0          0 pps
Output packets:                0          0 pps
Input errors:
Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
Resource errors: 0
Output errors:
Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

Resource errors: 0
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

```



```

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

SONET alarms   : None
SONET defects  : None
SONET PHY:
Seconds      Count  State
  PLL Lock      0      0 OK
  PHY Light     0      0 OK
SONET section:
BIP-B1        0      0
SEF           0      0 OK
LOS           0      0 OK
LOF           0      0 OK
ES-S          0
SES-S         0
SEFS-S        0
SONET line:
BIP-B2        0      0
REI-L         0
RDI-L         0      0 OK
AIS-L         0      0 OK
BERR-SF       0      0 OK
BERR-SD       0      0 OK
ES-L          0
SES-L         0
UAS-L         0
ES-LFE        0
SES-LFE       0
UAS-LFE       0
SONET path:
BIP-B3        0      0
REI-P         0
LOP-P         0      0 OK
AIS-P         0      0 OK
RDI-P         0      0 OK
UNEQ-P        1      1 OK
PLM-P         0      0 OK
ES-P          1
SES-P         1
UAS-P         0
ES-PFE        0
SES-PFE       0
UAS-PFE       0
Received SONET overhead:
F1   : 0x00, J0   : 0x00, K1   : 0x00, K2   : 0x00
S1   : 0x00, C2   : 0x13, C2(cmp) : 0x13, F2   : 0x00
Z3   : 0x00, Z4   : 0x00, S1(cmp) : 0x00
Transmitted SONET overhead:
F1   : 0x00, J0   : 0x01, K1   : 0x00, K2   : 0x00
S1   : 0x00, C2   : 0x13, F2   : 0x00, Z3   : 0x00
Z4   : 0x00
ATM status:
HCS state:   Sync
LOC         :   OK
ATM Statistics:
Uncorrectable HCS errors: 0, Correctable HCS errors: 0,

```

```

Tx cell FIFO overruns: 0, Rx cell FIFO overruns: 0,
Rx cell FIFO underruns: 0, Input cell count: 0, Output cell count: 0,
Output idle cell count: 0, Output VC queue drops: 0, Input no buffers: 0,
Input length errors: 0, Input timeouts: 0, Input invalid VCs: 0,
Input bad CRCs: 0, Input OAM cell no buffers: 0
Packet Forwarding Engine configuration:
  Destination slot: 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 (ATM2, SDH Mode)

```

user@host> show interfaces at-0/2/1
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
    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

  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 (ATM2, SONET Mode)

```

user@host> show interfaces at-0/3/1
Physical interface: at-0/3/1, Enabled, Physical link is Up
Interface index: 139, SNMP ifIndex: 67
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags : Present Running
Link flags : None
CoS queues : 4 supported, 4 maximum usable queues
Current address: 00:14:f6:22:58:5e
Last flapped : 2006-03-13 17:46:36 PST (16:01:12 ago)
Input rate : 0 bps (0 pps)
Output rate : 0 bps (0 pps)
SONET alarms : None
SONET defects : None
  VPI 0
    Flags: Active, OAM, Shaping
    CBR, Peak: 50kbps
    OAM, Period 30 sec, Up count: 10, Down count: 10
    Total down time: 0 sec, Last down: Never
    OAM F4 cell statistics:
      Total received: 4, Total sent: 4
      Loopback received: 4, Loopback sent: 4
      RDI received: 0, RDI sent: 0
      AIS received: 0
    Traffic statistics:
      Input packets: 4
      Output packets: 30
  VPI 10

```



```

      Flags: Active
      Total down time: 0 sec, Last down: Never
Traffic statistics:
      Input  packets:          0
      Output packets:          0
Logical interface at-0/3/1.0 (Index 78) (SNMP ifIndex 77)
  Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000
  Encapsulation: ATM-SNAP
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 4470
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 10.0.59.5, Local: 10.0.59.6
  Protocol iso, MTU: 4470
    Flags: None
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 10
    Input packets : 0
    Output packets: 0

Logical interface at-0/3/1.32767 (Index 79) (SNMP ifIndex 76)
  Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Input packets : 4
  Output packets: 30
VCI 0.16
  Flags: Active, ILMI
  Total down time: 0 sec, Last down: Never
  EPD threshold: 0, Transmit weight cells: 0
    Input packets : 0
    Output packets: 26
VCI 0.4
  Flags: Active, OAM
  OAM, Period 30 sec, Up count: 10, Down count: 10
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 0
    Input packets : 4
    Output packets: 4
  OAM F4 cell statistics:
    Total received: 4, Total sent: 4
    Loopback received: 4, Loopback sent: 4
    RDI received: 0, RDI sent: 0
    AIS received: 0, AIS sent: 0

```

show interfaces brief (ATM2, SONET Mode)

```

user@host> show interfaces at-0/3/1 brief
Physical interface: at-0/3/1, Enabled, Physical link is Up
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None

Logical interface at-0/3/1.0
  Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000
  Encapsulation: ATM-SNAP
  inet 10.0.59.6    --> 10.0.59.5
  iso

```

```
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 10
```

```
Logical interface at-0/3/1.32767
  Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
VCI 0.16
  Flags: Active, ILMI
  Total down time: 0 sec, Last down: Never
  EPD threshold: 0, Transmit weight cells: 0
VCI 0.4
  Flags: Active, OAM
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 0
```

show interfaces detail (ATM2, SONET Mode)

```
user@host> show interfaces at-0/3/1 detail
Physical interface: at-0/3/1, Enabled, Physical link is Up
  Interface index: 139, SNMP ifIndex: 67, Generation: 22
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
  Speed: OC3, Loopback: None, Payload scrambler: Enabled
  Device flags   : Present Running
  Link flags     : None
  CoS queues     : 4 supported, 4 maximum usable queues
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:14:f6:22:58:5e
  Last flapped   : 2006-03-13 17:46:36 PST (16:02:39 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :           312           0 bps
    Output bytes  :          2952           0 bps
    Input packets :             6           0 pps
    Output packets:            50           0 pps
  Egress queues: 4 supported, 4 in use
  Queue counters:


|                | Queued packets | Transmitted packets | Dropped packets |
|----------------|----------------|---------------------|-----------------|
| 0 best-effort  | 44             | 44                  | 0               |
| 1 expedited-fo | 0              | 0                   | 0               |
| 2 assured-forw | 0              | 0                   | 0               |
| 3 network-cont | 6              | 6                   | 0               |


  SONET alarms   : None
  SONET defects  : None
  VPI 0
    Flags: Active, OAM, Shaping
    CBR, Peak: 50kbps
    OAM, Period 30 sec, Up count: 10, Down count: 10
    Total down time: 0 sec, Last down: Never
  OAM F4 cell statistics:
    Total received: 6, Total sent: 6
    Loopback received: 6, Loopback sent: 6
    Last received: 00:00:29, Last sent: 00:00:29
    RDI received: 0, RDI sent: 0
    AIS received: 0
    Traffic statistics:
```

```

        Input bytes :           312
        Output bytes :          2952
        Input packets:           6
        Output packets:          50
VPI 10
  Flags: Active
  Total down time: 0 sec, Last down: Never
  Traffic statistics:
    Input bytes :              0
    Output bytes :              0
    Input packets:              0
    Output packets:             0

Logical interface at-0/3/1.0 (Index 78) (SNMP ifIndex 77) (Generation 20)
  Flags: Point-To-Point Copy-PLP-To-CLP SNMP-Traps 0x4000
  Encapsulation: ATM-SNAP
  Traffic statistics:
    Input bytes :              0
    Output bytes :              0
    Input packets:              0
    Output packets:             0
  Local statistics:
    Input bytes :              0
    Output bytes :              0
    Input packets:              0
    Output packets:             0
  Transit statistics:
    Input bytes :              0                0 bps
    Output bytes :              0                0 bps
    Input packets:              0                0 pps
    Output packets:             0                0 pps
  Protocol inet, MTU: 4470, Generation: 38, Route table: 0
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 10.0.59.5, Local: 10.0.59.6, Broadcast: Unspecified,
      Generation: 44
  Protocol iso, MTU: 4470, Generation: 39, Route table: 0
    Flags: None
VCI 0.128
  Flags: Active
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 10
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:
    Input bytes :              0
    Output bytes :              0
    Input packets:              0
    Output packets:             0

Logical interface at-0/3/1.32767 (Index 79) (SNMP ifIndex 76) (Generation 21)
  Flags: Point-To-Multipoint Copy-PLP-To-CLP No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Traffic statistics:
    Input bytes :              360
    Output bytes :             3302
    Input packets:              6
    Output packets:             50
  Local statistics:
    Input bytes :              360
    Output bytes :             3302
    Input packets:              6

```

```

Output packets:          50
VCI 0.16
  Flags: Active, ILMI
  Total down time: 0 sec, Last down: Never
  EPD threshold: 0, Transmit weight cells: 0
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:
    Input bytes  :          0
    Output bytes :        2640
    Input packets:          0
    Output packets:        44
VCI 0.4
  Flags: Active, OAM
  OAM, Period 30 sec, Up count: 10, Down count: 10
  Total down time: 0 sec, Last down: Never
  EPD threshold: 2129, Transmit weight cells: 0
  ATM per-VC transmit statistics:
    Tail queue packet drops: 0
  Traffic statistics:
    Input bytes  :        312
    Output bytes :        312
    Input packets:         6
    Output packets:        6
OAM F4 cell statistics:
  Total received: 6, Total sent: 6
  Loopback received: 6, Loopback sent: 6
  Last received: 00:00:29, Last sent: 00:00:29
  RDI received: 0, RDI sent: 0
  AIS received: 0, AIS sent: 0

```

show interfaces extensive (ATM2, SONET Mode)

```

user@host> show interfaces at-0/3/1 extensive
Physical interface: at-0/3/1, Enabled, Physical link is Up
Interface index: 139, SNMP ifIndex: 67, Generation: 22
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode,
Speed: OC3, Loopback: None, Payload scrambler: Enabled
Device flags   : Present Running
Link flags     : None
CoS queues     : 4 supported, 4 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:14:f6:22:58:5e
Last flapped   : 2006-03-13 17:46:36 PST (16:04:12 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes  :          520          0 bps
Output bytes :        4240          0 bps
Input packets:         10          0 pps
Output packets:        72          0 pps
Input errors:
Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
Resource errors: 0
Output errors:
Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

Resource errors: 0
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

```

0 best-effort	62	62	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	10	10	0

SONET alarms : None
SONET defects : None

SONET PHY:	Seconds	Count	State
PLL Lock	0	0	OK
PHY Light	0	0	OK

SONET section:

BIP-B1	0	0	
SEF	0	0	OK
LOS	0	0	OK
LOF	0	0	OK
ES-S	0		
SES-S	0		
SEFS-S	0		

SONET line:

BIP-B2	0	0	
REI-L	0	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>at-pim/0/port—Display standard information about the specified ADSL interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display the SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces (ATM-over-ADSL) on page 250</p> <p>show interfaces brief (ATM-over-ADSL) on page 250</p> <p>show interfaces detail (ATM-over-ADSL) on page 251</p> <p>show interfaces extensive (ATM-over-ADSL) on page 253</p>
Output Fields	Table 7 on page 248 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 7: 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 7: ATM-over-ADSL show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
ADSL status	<p>Operational information for ATM-over-ADSL interfaces.</p> <ul style="list-style-type: none"> • Modem status—Status of the modem: Down, Training, or Showtime. • DSL mode—Configured line type of the digital subscriber line: adsl2plus, ansi-dmt, auto, itu-dmt, or itu-dmt-bis. • Last fail code—Reason for failure: ATU-C not detected, incompatible line condition, protocol error, message error, spurious ATU detected, forced silence, unselectable operation mode, or none. • Subfunction—Specified analog front-end chip and discrete front. • Seconds in showtime—Number of seconds the ADSL connection is in showtime. 	detail extensive none
ADSL media	<p>Information about ADSL media-specific defects that can prevent the interface from passing packets. The following information is displayed for each defect:</p> <ul style="list-style-type: none"> • Seconds—Number of seconds the defect has been active. • Count—Number of times that the defect has gone from inactive to active. • State—State of the error. A state other than OK indicates a problem. <p>The possible defects are as follows:</p> <ul style="list-style-type: none"> • LOF—Loss of frame. • LOS—Loss of signal. • LOM—Loss of multiframe. • LOP—Loss of pointer. • LOCDI—Loss of cell delineation for an interleaved channel. • LOCDNI—Loss of cell delineation for a noninterleaved channel. 	extensive
ADSL Statistics	<p>Information about the ADSL terminal unit-remote (ATU-R) at the far end of the connection and the ADSL terminal unit-central office (ATU-C) at the near end:</p> <ul style="list-style-type: none"> • Attenuation (dB)—Attenuation in decibels. • Capacity used (%)—Percentage of capacity used. • Noise margin (dB)—Maximum extraneous signal allowed without causing the output to deviate from an allowable level, in decibels. • Output power (dBm)—Amount of power used by the ATM-over-ADSL interface. • Bit rate (kbps)—Speed of data transfer on the ATM-over-ADSL interface, in kilobits per second. • CRC—Number of cyclic redundancy check errors. • FEC—Number of forward error corrections. • HEC—Number of header error checksums. • Received cells—Number of cells received through the interface. • Transmitted cells—Number of cells sent through the interface. 	detail extensive

Sample Output

show interfaces (ATM-over-ADSL)

```
user@host> show interfaces at-5/0/0
Physical interface: at-5/0/0, Enabled, Physical link is Down
  Interface index: 149, SNMP ifIndex: 68
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
  Speed: ADSL2+, Loopback: None
  Device flags   : Present Running Down
  Link flags     : None
  CoS queues     : 8 supported, 8 in use
  Current address: 00:05:85:c3:85:84
  Last flapped   : 2005-12-19 15:36:02 PST (12w0d 18:33 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  ADSL alarms    : None
  ADSL defects   : None
  ADSL status:
    Modem status : Training
    DSL mode      : Adsl2plus  Annex A
    Last fail code: ATU-C not detected
    Subfunction   : 0x00
    Seconds in showtime : 0

Logical interface at-5/0/0.0 (Index 70) (SNMP ifIndex 71)
  Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000
  Encapsulation: Ether-over-ATM-LLC
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 1500
  Flags: None
  VCI 0.128
  Flags: Active, Multicast
  Total down time: 0 sec, Last down: Never
  Input packets : 0
  Output packets: 0

Logical interface at-5/0/0.32767 (Index 71) (SNMP ifIndex 70)
  Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  Input packets : 0
  Output packets: 0
  VCI 0.4
  Flags: Active
  Total down time: 0 sec, Last down: Never
  Input packets : 0
  Output packets: 0
```

show interfaces brief (ATM-over-ADSL)

```
user@host> show interfaces at-5/0/0 brief
Physical interface: at-5/0/0, Enabled, Physical link is Down
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
  Speed: ADSL2+, Loopback: None
  Device flags   : Present Running Down
  Link flags     : None
  Logical interface at-5/0/0.0
    Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000
    Encapsulation: Ether-over-ATM-LLC
    inet
```

```
VCI 0.128
  Flags: Active, Multicast
  Total down time: 0 sec, Last down: Never
```

```
Logical interface at-5/0/0.32767
  Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
VCI 0.4
  Flags: Active
  Total down time: 0 sec, Last down: Never
```

show interfaces detail (ATM-over-ADSL)

```
user@host> show interfaces at-5/0/0 detail
Physical interface: at-5/0/0, Enabled, Physical link is Down
  Interface index: 149, SNMP ifIndex: 68, Generation: 30
  Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, ADSL mode,
  Speed: ADSL2+, Loopback: None
  Device flags   : Present Running Down
  Link flags     : None
  CoS queues     : 8 supported, 8 in use
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:05:85:c3:85:84
  Last flapped   : 2005-12-19 15:36:02 PST (12w0d 18:33 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :          0          0 bps
    Output bytes  :          0          0 bps
    Input packets :          0          0 pps
    Output packets:          0          0 pps
  Queue counters:      Queued packets  Transmitted packets  Dropped packets

    0 best-effort          0              0              0
    1 expedited-fo        0              0              0
    2 assured-forw        0              0              0
    3 network-cont        0              0              0
    4 be-class            0              0              0
    5 ef-class            0              0              0
    6 af-class            0              0              0

  ADSL alarms   : None
  ADSL defects  : None
  ADSL status:
    Modem status : Training
    DSL mode      : Adsl2plus  Annex A
    Last fail code: ATU-C not detected
    Subfunction   : 0x00
    Seconds in showtime : 0
  ADSL Statistics:
    Attenuation (dB) :          0.0          0.0
    Capacity used (%) :          0          0
    Noise margin (dB) :          0.0          0.0
    Output power (dBm) :          0.0          0.0

                                Interleave      Fast  Interleave      Fast
```

Bit rate (kbps) :	0	0	0	0
CRC :	0	0	0	0
FEC :	0	0	0	0
HEC :	0	0	0	0
Received cells :	0	0		
Transmitted cells :	0	0		

Logical interface at-5/0/0.0 (Index 70) (SNMP ifIndex 71) (Generation 8)

Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000

Encapsulation: Ether-over-ATM-LLC

Traffic statistics:

Input bytes :	0
Output bytes :	0
Input packets:	0
Output packets:	0

Local statistics:

Input bytes :	0
Output bytes :	0
Input packets:	0
Output packets:	0

Transit statistics:

Input bytes :	0	0 bps
Output bytes :	0	0 bps
Input packets:	0	0 pps
Output packets:	0	0 pps

Protocol inet, MTU: 1500, Generation: 12, Route table: 0

Flags: None

VCI 0.128

Flags: Active, Multicast

Total down time: 0 sec, Last down: Never

ATM per-VC transmit statistics:

Tail queue packet drops: 0

Traffic statistics:

Input bytes :	0
Output bytes :	0
Input packets:	0
Output packets:	0

Logical interface at-5/0/0.32767 (Index 71) (SNMP ifIndex 70) (Generation 9)

Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000

Encapsulation: ATM-VCMUX

Traffic statistics:

Input bytes :	0
Output bytes :	0
Input packets:	0
Output packets:	0

Local statistics:

Input bytes :	0
Output bytes :	0
Input packets:	0
Output packets:	0

VCI 0.4

Flags: Active

Total down time: 0 sec, Last down: Never

ATM per-VC transmit statistics:

Tail queue packet drops: 0

Traffic statistics:

Input bytes :	0
Output bytes :	0

```

Input packets:          0
Output packets:         0

```

show interfaces 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 bps	%	Buffer usec	Priority	Limit
0 best-effort	95	7600000	95	0	low	none
3 network-control	5	400000	5	0	low	none

Logical interface at-5/0/0.0 (Index 70) (SNMP ifIndex 71) (Generation 8)

```

Flags: Device-Down Point-To-Multipoint SNMP-Traps 0x4000

```

```

Encapsulation: Ether-over-ATM-LLC

```

Traffic statistics:

```

Input bytes   :          0
Output bytes  :          0
Input packets :          0
Output packets:          0

```

Local statistics:

```

Input bytes   :          0
Output bytes  :          0
Input packets :          0
Output packets:          0

```

Transit statistics:

```

Input bytes   :          0          0 bps
Output bytes  :          0          0 bps
Input packets :          0          0 pps
Output packets:          0          0 pps

```

```

Protocol inet, MTU: 1500, Generation: 12, Route table: 0

```

```

Flags: None

```

```

VCI 0.128

```

```

Flags: Active, Multicast

```

```

Total down time: 0 sec, Last down: Never

```

ATM per-VC transmit statistics:

```

Tail queue packet drops: 0

```

Traffic statistics:

```

Input bytes   :          0
Output bytes  :          0
Input packets :          0
Output packets:          0

```

Logical interface at-5/0/0.32767 (Index 71) (SNMP ifIndex 70) (Generation 9)

```
Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
Local statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
VCI 0.4
Flags: Active
Total down time: 0 sec, Last down: Never
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:         0
```

show interfaces (ATM-over-SHDSL)

Syntax	<code>show interfaces at-pim/0/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	(J Series routers) Display status information about the specified ATM-over-symmetric high-speed DSL (SHDSL) interface.
Options	<code>at-pim/0/port</code> —Display standard information about the specified SHDSL interface <code>brief detail extensive terse</code> —(Optional) Display the specified level of output. <code>descriptions</code> —(Optional) Display interface description strings. <code>media</code> —(Optional) Display media-specific information about network interfaces. <code>snmp-index <i>snmp-index</i></code> —(Optional) Display the SNMP index of the interface. <code>statistics</code> —(Optional) Display static interface statistics.
Required Privilege Level	view
List of Sample Output	show interfaces (ATM-over-SHDSL) on page 258 show interfaces brief (ATM-over-SHDSL) on page 259 show interfaces detail (ATM-over-SHDSL) on page 259 show interfaces extensive (ATM-over-SHDSL) on page 261
Output Fields	Table 8 on page 257 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 8: ATM-over-SHDSL show interfaces Output Fields

Field Name	Field Description	Level of Output
SHDSL alarms	Number and type of SHDSL alarms. See "SHDSL media" for details.	detail extensive none
SHDSL defects	Number and type of SHDSL defects. See "SHDSL media" for details.	detail extensive none
SHDSL media	<p>Information about the SHDSL media-specific defects that can prevent the interface from passing packets. The following information is displayed for each defect:</p> <ul style="list-style-type: none"> • Seconds—Number of seconds the defect has been active. • Count—Number of times that the defect has gone from inactive to active. • State—State of the error. A state other than OK indicates a problem. <p>The possible defects are as follows:</p> <ul style="list-style-type: none"> • LOSD—Loss of signal was detected at the remote application interface. • LOSW—Loss of sync word. A message ID was sent. • ES—Errored seconds. One or more cyclic redundancy check (CRC) anomalies were detected. • SES—Severely errored seconds. At least 50 CRC anomalies were detected. • UAS—Unavailable seconds. An interval occurred during which one or more LOSW defects were detected. 	extensive
SHDSL status	<p>Operational information for ATM-over-SHDSL interfaces.</p> <ul style="list-style-type: none"> • Line termination—SHDSL transceiver unit- remote (STU-R) (Only customer premises equipment is supported.) • Annex—Either Annex A or Annex B. Annex A is supported in North America, and Annex B is supported in Europe. • Line mode—SHDSL mode configured on the G.SHDSL Physical Interface Module (PIM), either 2-wire or 4-wire. • Modem status—Data. • Bit rate (kbps)—Speed of data transfer on the ATM-over-G.SHDSL interface, in kilobits per second. • Last fail mode—Code for the last interface failure. • 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 8: 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

Sample Output

show interfaces (ATM-over-SHDSL)

```

user@host> show interfaces at-4/0/0
Physical interface: at-4/0/0, Enabled, Physical link is Down
  Interface index: 141, SNMP ifIndex: 41
  Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
  Speed: SHDSL(2-wire), Loopback: None
  Device flags   : Present Running Down
  Link flags     : None
  CoS queues     : 8 supported, 8 in use
  Current address: 00:05:85:c2:44:60
  Last flapped   : 2006-03-21 15:07:11 PST (2w0d 00:59 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  SHDSL alarms   : LOSD
  SHDSL defects  : LOSD
  SHDSL status:
    Line termination : STU-R
    Annex            : Unknown
    Line mode        : 2-wire
    Modem status     : Training
    Bit rate (kbps)  : 0
    Last fail mode   : No failure (0x00)
    Frammer mode     : ATM
    Dying gasp       : Enabled
    Frammer sync status : Out of sync
    Chipset version  : 00
    Firmware version : R3.0.1

  Logical interface at-4/0/0.0 (Index 68) (SNMP ifIndex 44)
    Flags: Device-Down Point-To-Point SNMP-Traps 0x4000
    Encapsulation: Ether-over-ATM-LLC
  Input packets : 0
  Output packets: 0
  Protocol inet, MTU: 1500

```

```

    Flags: None
    VCI 0.128
    Flags: Active
    Total down time: 0 sec, Last down: Never
    Input packets : 0
    Output packets: 0
Logical interface at-4/0/0.32767 (Index 69) (SNMP ifIndex 43)
    Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
    Encapsulation: ATM-VCMUX
    Input packets : 0
    Output packets: 0
    VCI 0.4
    Flags: Active
    Total down time: 0 sec, Last down: Never
    Input packets : 0
    Output packets: 0

```

show interfaces brief (ATM-over-SHDSL)

```

user@host> show interfaces at-4/0/0 brief
Physical interface: at-4/0/0, Enabled, Physical link is Down
  Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
  Speed: SHDSL(2-wire), Loopback: None
  Device flags   : Present Running Down
  Link flags     : None

Logical interface at-4/0/0.0
  Flags: Device-Down Point-To-Point SNMP-Traps 0x4000
  Encapsulation: Ether-over-ATM-LLC
  inet
  VCI 0.128
    Flags: Active
    Total down time: 0 sec, Last down: Never

Logical interface at-4/0/0.32767
  Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
  Encapsulation: ATM-VCMUX
  VCI 0.4
    Flags: Active
    Total down time: 0 sec, Last down: Never

```

show interfaces detail (ATM-over-SHDSL)

```

user@host> show interfaces at-4/0/0 detail
Physical interface: at-4/0/0, Enabled, Physical link is Down
  Interface index: 141, SNMP ifIndex: 41, Generation: 22
  Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
  Speed: SHDSL(2-wire), Loopback: None
  Device flags   : Present Running Down
  Link flags     : None
  CoS queues     : 8 supported, 8 in use
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:05:85:c2:44:60
  Last flapped   : 2006-03-21 15:07:11 PST (2w0d 01:00 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   : 0 0 bps
    Output bytes  : 0 0 bps
    Input packets : 0 0 pps
    Output packets: 0 0 pps
  Queue counters:  Queued packets  Transmitted packets  Dropped packets

```

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

SHDSL alarms : LOSD

SHDSL defects : LOSD

SHDSL status:

```

Line termination      : STU-R
Annex                 : Unknown
Line mode             : 2-wire
Modem status          : Training
Bit rate (kbps)       : 0
Last fail mode        : No failure (0x00)
Framer mode           : ATM
Dying gasp            : Enabled
Framer sync status    : Out of sync
Chipset version       : 00
Firmware version      : R3.0.1

```

SHDSL statistics:

```

Loop attenuation (dB) : 2.3
Transmit power (dBm)  : 0.0
Receiver gain (dB)    : 20.412
CRC errors             : 0
SEGA errors           : 0
LOSW errors           : 0
Received cells        : 0
Transmitted cells     : 0
HEC errors            : 0
Cell drop             : 0

```

Logical interface at-4/0/0.0 (Index 68) (SNMP ifIndex 44) (Generation 8)

Flags: Device-Down Point-To-Point SNMP-Traps 0x4000

Encapsulation: Ether-over-ATM-LLC

Traffic statistics:

```

Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0

```

Local statistics:

```

Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0

```

Transit statistics:

```

Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps

```

Protocol inet, MTU: 1500, Generation: 11, Route table: 0

Flags: None

VCI 0.128

Flags: Active

Total down time: 0 sec, Last down: Never

ATM per-VC transmit statistics:

Tail queue packet drops: 0

Traffic statistics:

```

        Input bytes :          0
        Output bytes :         0
        Input packets:         0
        Output packets:        0

Logical interface at-4/0/0.32767 (Index 69) (SNMP ifIndex 43) (Generation 9)
Flags: Device-Down Point-To-Multipoint No-Multicast SNMP-Traps 0x4000
Encapsulation: ATM-VCMUX
Traffic statistics:
  Input bytes :          0
  Output bytes :         0
  Input packets:         0
  Output packets:        0
Local statistics:
  Input bytes :          0
  Output bytes :         0
  Input packets:         0
  Output packets:        0
VCI 0.4
Flags: Active
Total down time: 0 sec, Last down: Never
ATM per-VC transmit statistics:
Tail queue packet drops: 0
Traffic statistics:
  Input bytes :          0
  Output bytes :         0
  Input packets:         0
  Output packets:        0

```

show interfaces extensive (ATM-over-SHDSL)

```

user@host> show interfaces at-4/0/0 extensive
Physical interface: at-4/0/0, Enabled, Physical link is Down
Interface index: 141, SNMP ifIndex: 41, Generation: 22
Link-level type: Ethernet-over-ATM, MTU: 4482, Clocking: Internal,
Speed: SHDSL(2-wire), Loopback: None
Device flags   : Present Running Down
Link flags     : None
CoS queues     : 8 supported, 8 in use
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:05:85:c2:44:60
Last flapped   : 2006-03-21 15:07:11 PST (2w0d 01:02 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          0          0 bps
  Output bytes :          0          0 bps
  Input packets:          0          0 pps
  Output packets:          0          0 pps
Input errors:
  Errors: 0, Drops: 0, Invalid VCs: 0, Framing errors: 0, Policed discards: 0,

  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
  Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

  Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 best-effort              0              0              0

```

```

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

SHDSL alarms : LOSD
SHDSL defects : LOSD
SHDSL media:
    Seconds      Count  State
    LOSD         1228405    1 Defect Active
    LOSW          0         0 OK
    ES            0
    SES           0
    UAS           1228402
SHDSL status:
    Line termination : STU-R
    Annex            : Unknown
    Line mode        : 2-wire
    Modem status     : Training
    Bit rate (kbps)  : 0
    Last fail mode   : No failure (0x00)
    Frammer mode     : ATM
    Dying gasp       : Enabled
    Frammer sync status : Out of sync
    Chipset version  : 00
    Firmware version : R3.0.1
SHDSL statistics:
    Loop attenuation (dB) : 2.3
    Transmit power (dBm) : 0.0
    Receiver gain (dB)   : 20.412
    CRC errors           : 0
    SEGA errors          : 0
    LOSW errors          : 0
    Received cells       : 0
    Transmitted cells    : 0
    HEC errors           : 0
    Cell drop            : 0
Packet Forwarding Engine configuration:
    Destination slot: 4
CoS 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 bytes : 0 bps
    Output bytes : 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 (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>ds-fpc/pic/port:t1channel:ds0channel—Display standard information about the specified channelized DS3-to-DS0 interface.</p> <p>brief detail extensive—(Optional) Display the specified level of output interface.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (Channelized DS3-to-DS0) on page 272
Output Fields	Table 9 on page 264 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 9: 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 <i>Common Output Fields Description</i> .	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 9: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	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 9: 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 value 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 9: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CHAP state	<p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> • Chap-Chal-received—Challenge was received but response not yet sent. • Chap-Chal-sent—Challenge was sent. • Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication). • Chap-Resp-sent—Response was sent for the challenge received. • Closed—CHAP authentication is incomplete. • Failure—CHAP authentication failed. • Not-configured—CHAP is not configured on the interface. • Success—CHAP authentication was successful. 	detail extensive none
Last flapped	Date, time, and how long ago the interface went from down to up. The format is Last flapped: <i>year-month-day hour:minute:second timezone hh:mm:ss ago</i> . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) .	detail extensive none
Statistics last cleared	Time when the statistics for the interface were last set to zero.	detail extensive
Traffic statistics	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> • Input bytes, Output bytes—Number of bytes received and transmitted on the interface. • Input packets, Output packets—Number of packets received and transmitted on the interface. 	detail extensive

Table 9: 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 9: 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 9: 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 9: 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 <i>Common Output Fields Description</i> .	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 9: 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 <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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

Sample Output

show interfaces extensive (Channelized DS3-to-DS0)

```

user@host> show interfaces ds-0/0/0:0:0 extensive
Physical interface: ds-0/0/0:0:0, Enabled, Physical link is Up
  Interface index: 174, SNMP ifIndex: 4298, Generation: 177
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 640kbps, FCS: 16,
  Mode: C/Bit parity, Framing: ESF
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives
  Hold-times    : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 280 (last seen 00:00:09 ago)
    Output: 286 (last sent 00:00:00 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Not-configured
  Last flapped   : 2002-05-23 17:53:29 PDT (00:46:46 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :           6814           16 bps
    Output bytes  :          28840           72 bps
    Input packets :           568           0 pps
    Output packets:           893           0 pps
  Input errors:

```


Errors: 0, Drops: 0, Framing errors: 39, Policed discards: 0,
 L3 incompletes: 0, L2 channel errors: 2, L2 mismatch timeouts: 0,
 HS link CRC errors: 0

Output errors:

Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0

DS1 alarms : None

DS3 alarms : None

DS1 defects : None

DS3 defects : None

T1 media:	Seconds	Count	State
SEF	0	0	OK
BEE	5	1	OK
AIS	0	0	OK
LOF	0	0	OK
LOS	0	0	OK
YELLOW	17	1	OK
BPV	0	0	
EXZ	0	0	
LCV	5	27765	
PCV	0	0	
CS	0	0	
LES	0		
ES	0		
SES	5		
SEFS	10		
BES	0		
UAS	0		

DS3 media:	Seconds	Count	State
PLL Lock	0	0	OK
Reframing	0	0	OK
AIS	0	0	OK
LOF	0	0	OK
LOS	0	0	OK
IDLE	0	0	OK
YELLOW	0	0	OK
BPV	1	65535	
EXZ	1	65535	
LCV	2	131070	
PCV	1	1825	
CCV	0	0	
LES	1		
PES	1		
PSES	1		
CES	0		
CSES	0		
SEFS	0		
UAS	0		

Interface transmit queues:

	B/W	WRR	Packets	Bytes	Drops	Errors
Queue0	95	95	0	0	0	0
Queue1	5	5	893	28840	0	0

HDLC configuration:

Giant threshold: 1514, Runt threshold: 3

Timeslots : 1-10

Byte encoding: Nx64K, Data inversion: Disabled

DS3 BERT configuration:

BERT time period: 10 seconds, Elapsed: 0 seconds

Algorithm: 2^15 - 1, Induced error rate: 10e-0

DS1 BERT configuration:

BERT time period: 10 seconds, Elapsed: 0 seconds

Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)

Packet Forwarding Engine configuration:
Destination slot: 0, PLP byte: 2 (0x01)
CoS 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	<code>show interfaces t1-fpc/pic/port:t1channel</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 channelized DS3-to-DS1 interface.
Options	<p><code>t1-fpc/pic/port:t1channel</code>—Display standard information about the specified channelized DS3-to-DS1 interface.</p> <p><code>brief detail extensive terse</code>—(Optional) Display brief interface information.</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>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (channelized DS3-to-DS1) on page 275
Output Fields	See the output field table for the show interfaces (Channelized DS3-to-DS0) command .

Sample Output

show interfaces extensive (channelized DS3-to-DS1)

```

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:
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 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>type-fpc/pic/port:<channel>—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>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces (Channelized E1 IQ) (Physical) on page 278</p> <p>show interfaces extensive (Channelized E1 IQ Multilink PPP Encapsulation) on page 279</p> <p>show interfaces extensive (Channelized E1 IQ MLFR Encapsulation) on page 280</p> <p>show interfaces detail (Clear Channel E1) on page 281</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.

Sample Output

show interfaces (Channelized E1 IQ) (Physical)

```
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
  Enquiry responses received : 43185
  Full enquiry responses received : 8515
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses timedout : 0
Nonmatching DCE-end DLCIs:
  2
Last flapped   : 2002-10-04 17:52:51 PDT (00:32:57 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)
DS1 alarms     : None
DS1 defects    : None

```

show interfaces extensive (Channelized E1 IQ Multilink PPP Encapsulation)

```

user@host> show interfaces ds-0/3/4:1 extensive
Physical interface: ds-0/3/4:1, Enabled, Physical link is Up
Interface index: 151, SNMP ifIndex: 63, Generation: 34
Link-level type: Multilink-PPP, MTU: 1518, Clocking: Internal, Speed: 64kbps,
Loopback: None, FCS: 16,
Parent: ce1-0/3/4 Interface index 150
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : None
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)
LCP state: Down
CHAP state: Closed
CoS queues    : 4 supported, 4 maximum usable queues
Last flapped  : Never
Statistics last cleared: 2005-12-21 10:32:15 PST (1w0d 03:10 ago)
Traffic statistics:
  Input bytes   : 0                      0 bps
  Output bytes  : 6070570                 224 bps
  Input packets : 0                      0 pps
  Output packets: 209330                 0 pps
Input errors:
  Errors: 3, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0,
  L2 mismatch timeouts: 0, HS link CRC errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,
  Resource errors: 0
HDLC configuration:
  Giant threshold: 1528, Runt threshold: 2
  Timeslots      : 1
  Data inversion: Disabled, Idle cycle flag: flags, Start end flag: shared

```

```

DSO BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 4 (0x00)

Logical interface ds-0/3/4:1.0 (Index 74) (SNMP ifIndex 64) (Generation 13)
  Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol mlppp, Multilink bundle: ls-0/1/0.0, MTU: 1514, Generation: 24,
  Route table: 0

```

show interfaces extensive (Channelized E1 IQ MLFR Encapsulation)

```

user@host> show interfaces ds-0/3/4:5 extensive
Physical interface: ds-0/3/4:5, Enabled, Physical link is Up
  Interface index: 155, SNMP ifIndex: 72, Generation: 38
  Link-level type: Multilink-FR, MTU: 1518, Clocking: Internal, Speed: 64kbps,
  Loopback: None, FCS: 16,
  Parent: ce1-0/3/4 Interface index 150
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : No-Keepalives DCE
  Hold-times    : Up 0 ms, Down 0 ms
  ANSI LMI settings: n392dce 3, n393dce 4, t392dce 15 seconds
  LMI statistics:
    Input : 0 (last seen: never)
    Output: 0 (last sent: never)
  DTE statistics:
    Enquiries sent           : 0
    Full enquiries sent      : 0
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received  : 0
    Enquiry responses sent   : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses 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

```



```

DSO BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 4 (0x01)

Logical interface ds-0/3/4:5.0 (Index 78) (SNMP ifIndex 73) (Generation 17)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
  Local statistics:
    Input bytes : 0
    Output bytes : 0
    Input packets: 0
    Output packets: 0
  Transit statistics:
    Input bytes : 0 0 bps
    Output bytes : 0 0 bps
    Input packets: 0 0 pps
    Output packets: 0 0 pps
  Protocol mlfrr, Multilink bundle: ls-0/1/0.1, MTU: 1514, Generation: 28, Route
table: 0
  DLCI 10
    Flags: Active
    Total down time: 0 sec, Last down: Never
    Traffic statistics:
      Input bytes : 0
      Output bytes : 0
      Input packets: 0
      Output packets: 0
  DLCI statistics:
    Active DLCI :1 Inactive DLCI :0

```

show interfaces detail (Clear Channel E1)

```

user@host> show interfaces e1-1/2/6 detail
Physical interface: e1-1/2/6, Enabled, Physical link is Up
  Interface index: 89, SNMP ifIndex: 1278, Generation: 341
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: E1, Loopback:None,
...
  Logical interface e1-1/2/6.0 (Index 52) (SNMP ifIndex 1279) (Generation 169)
    Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
    Bandwidth: 0
...

```

show interfaces (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>ds-fpc/pic/port:ds0channel—Display standard information about the specified channelized E1 interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (Channelized E1) on page 290
Output Fields	Table 10 on page 282 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 10: 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 <i>Common Output Fields Description</i> .	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 10: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under <i>Common Output Fields Description</i> .	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 10: 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 10: Channelized E1 and Channelized E1 IQ 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 <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	(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
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
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 10: 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 10: 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 10: 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—Bursty errored 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 10: 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 <i>Common Output Fields Description</i> .	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 10: Channelized E1 and Channelized E1 IQ 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 interface. <ul style="list-style-type: none"> • Input bytes—Number of bytes received on the interface. • Output bytes—Number of bytes transmitted on the interface. • Input packets—Number of packets received on the interface. • Output packets—Number of packets transmitted on the interface. 	detail extensive
Local statistics	(Frame Relay) Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 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	(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 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

Sample Output

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 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 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:channel`—At the fourth level of channelization, **type** is `ds` (from `ct1`).

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level view

List of Sample Output

- [show interfaces extensive \(CAU4 on Channelized OC-12 IQ\) on page 294](#)
- [show interfaces extensive \(Channelized OC1 on Channelized OC12 IQ\) on page 294](#)
- [show interfaces extensive \(Channelized OC12 IQ\) \(Physical\) on page 294](#)
- [show interfaces extensive \(Channelized T1 from Channelized OC12 IQ\) on page 295](#)
- [show interfaces extensive \(Channelized T3 on Channelized OC12 IQ\) on page 295](#)
- [show interfaces extensive \(CSTM4 on Channelized OC-12 IQ\) on page 295](#)
- [show interfaces extensive \(DS0 on Channelized OC12 IQ\) on page 295](#)
- [show interfaces extensive \(SONET Interface on Channelized OC12 IQ\) on page 295](#)
- [show interfaces extensive \(T1 on Channelized OC12 IQ\) on page 296](#)

Output Fields See the output field table for the [show interfaces \(Channelized OC3 IQ and IQE\)](#) command.

Sample Output

[show interfaces extensive \(CAU4 on Channelized OC-12 IQ\)](#)

```
user@host> show interfaces cau4-0/2/0:1 extensive
Physical interface: cau4-0/2/0:1, Enabled, Physical link is Up
  Interface index: 219, SNMP ifIndex: 139, Generation: 221
  Link-level type: Controller, Clocking: Internal, SDH mode, Speed: OC3,
  Loopback: None, Parent: cstm4-0/2/0 Interface index 216
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : None
...
```

[show interfaces extensive \(Channelized OC1 on Channelized OC12 IQ\)](#)

```
user@host> show interfaces extensive coc1-4/2/0:7
Physical interface: coc1-4/2/0:7, Enabled, Physical link is Up
  Interface index: 381, SNMP ifIndex: 2524, Generation: 728
  Link-level type: Controller, MTU: 4474, Clocking: Internal, SONET mode,
  Speed: 51840kbps, Loopback: None,
  FCS: 16, Payload scrambler: Disabled, Parent: coc12-4/2/0 (Index 266)
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
...
```

[show interfaces extensive \(Channelized OC12 IQ\) \(Physical\)](#)

```
user@host> show interfaces extensive coc12-4/2/0
Physical interface: coc12-4/2/0, Enabled, Physical link is Up
  Interface index: 266, SNMP ifIndex: 1269, Generation: 601
  Link-level type: Controller, MTU: 4474, Clocking: Internal, SONET mode,
  Speed: OC12, Loopback: None,
  FCS: 16, Payload scrambler: Disabled, Parent: None Device flags   : Present
Running
  Interface flags: Point-To-Point SNMP-Traps
```

```
Link flags      : Keepalives DTE
...
```

show interfaces extensive (Channelized T1 from Channelized OC12 IQ)

```
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
...
```

show interfaces extensive (Channelized T3 on Channelized OC12 IQ)

```
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
...
```

show interfaces extensive (CSTM4 on Channelized OC-12 IQ)

```
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
...
```

show interfaces extensive (DSO on Channelized OC12 IQ)

```
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
...
```

show interfaces extensive (SONET Interface on Channelized OC12 IQ)

```
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
...

```

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, 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 (Channelized OC12)

Syntax	<code>show interfaces t3-fpc/pic/port:t3channel</code> <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 channelized OC12 interface.
Options	<p><code>t3-fpc/pic/port:t3channel</code>—Display standard information about the specified channelized OC12 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>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (Channelized OC12) on page 297
Output Fields	See the output field table for the show interfaces (Channelized OC3 IQ and IQE) command.

Sample Output

show interfaces extensive (Channelized OC12)

```

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
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
HDLCD 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 OC3 IQ and IQE)

Syntax	<pre>show interfaces (<i>type-fpc/pic/port</i> <:<i>channel</i>><:<i>channel</i>><:<i>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, <i>type</i> is coc3. For the clear channel, <i>type</i> is so (for OC3). <i>type-fpc/pic/port:channel</i>—At the first level of channelization, <i>type</i> 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, <i>type</i> 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, <i>type</i> 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 315</p> <p>show interfaces extensive (Channelized OC1 on Channelized OC3 IQ) on page 316</p> <p>show interfaces extensive (Channelized T1 on Channelized OC3 IQ) on page 317</p> <p>show interfaces extensive (DSO on Channelized OC3 IQ) on page 318</p>
Output Fields	Table 11 on page 302 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 11: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.	detail extensive

Table 11: 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 11: 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 11: 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 11: 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 11: 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 11: 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 11: 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 (signal) 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 11: 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	<p>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.</p>	
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 11: 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 11: 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 11: 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 11: 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 <i>Common Output Fields Description</i> .	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 11: 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 <i>Common Output Fields Description</i> .	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

Sample Output

show interfaces extensive (Channelized OC3 IQ) (Physical)

```

user@host> show interfaces extensive coc3-0/0/0
Physical interface: coc3-0/0/0, Enabled, Physical link is Down
  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 (DS0 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 STM1 IQ)

Syntax	<code>show interfaces (<i>type-fpc/pic/port</i> <:<i>channel</i>><:<i>channel</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	(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, <i>type</i> is cstm1. For the clear channel, <i>type</i> 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, <i>type</i> 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, <i>type</i> is ds (from ce1). <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 (Channelized STM1 IQ) (Physical) on page 320 show interfaces (Channelized AU-4) (Physical) on page 321 show interfaces (Channelized E1) (Physical) on page 321 show interfaces (DS) on page 322
Output Fields	See the output field table for the show interfaces (Channelized STM1) command.

Sample Output

show interfaces (Channelized STM1 IQ) (Physical)

```
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
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
...
```

show interfaces (Channelized STM1)

Syntax	<pre>show interfaces e1-fpc/pic/port:elchannel <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 interface.
Options	<p>e1-fpc/pic/port:elchannel—Display standard status information about the specified channelized STM1 interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (Channelized STM1, SDH) on page 334
Output Fields	Table 12 on page 323 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 12: 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 <i>Common Output Fields Description</i> .	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 12: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the "Link Flags" section under <i>Common Output Fields Description</i> .	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 12: 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</i> ago). Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: <i>nn</i> (last seen <i>hh:mm:ss</i> ago). 	detail extensive none
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 12: Channelized STM1 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). • 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
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 12: 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 12: 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 12: 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 12: 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 12: 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 12: 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	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> signal. • Z3 and Z4—Allocated for future use. 	
Received path trace	Channelized OC12 interfaces allow path trace bytes to be sent inband across the SONET/SDH link. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits. This information is specific to each of the 12 channelized OC12 interfaces.	extensive
Transmitted path trace		
Packet Forwarding Engine configuration	<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 12: Channelized STM1 show interfaces 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
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	detail extensive none
Destination	IP address of the remote side of the connection.	detail extensive none

Table 12: Channelized STM1 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
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

Sample Output

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 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>type-fpc/pic/port:channel—Interface type. With optional corresponding channel levels, the interface type can be one of the following:</p> <ul style="list-style-type: none"> type-fpc/pic/port—For the physical channelized T1 IQ interface, type is ct1. type-fpc/pic/port:channel—For the clear channel, type is t1. At the first level of channelization, type can be ct1 or t1. type-fpc/pic/port:channel:channel—At the second level of channelization, type can be ds. <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (CT1) on page 346 show interfaces extensive (T1) on page 347 show interfaces extensive (DS0) on page 348
Output Fields	Table 13 on page 338 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 13: 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 13: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	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 13: 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 13: Channelized T1 IQ and T3 IQ 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) Number of DLCIs configured from the DCE, displayed only from the DTE.	detail extensive none
LCP state	(PPP) Link Control Protocol state. <ul style="list-style-type: none"> Conf-ack-received—Acknowledgement was received. Conf-ack-sent—Acknowledgement was sent. Conf-req-sent—Request was sent. Down—LCP negotiation is incomplete (not yet completed or has failed). Not-configured—LCP is not configured on the interface. Opened—LCP negotiation is successful. 	detail extensive none
NCP state	(PPP) Network Control Protocol state. <ul style="list-style-type: none"> Conf-ack-received—Acknowledgement was received. Conf-ack-sent—Acknowledgement was sent. Conf-req-sent—Request was sent. Down—NCP negotiation is incomplete (not yet completed or has failed). Not-configured—NCP is not configured on the interface. Opened—NCP negotiation is successful. 	detail extensive none
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
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 13: 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 13: 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 13: 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 13: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	detail extensive none
Destination	IP address of the remote side of the connection.	detail extensive none
Local	IP address of the logical interface.	detail extensive none
Broadcast	Broadcast address.	detail extensive none

Table 13: Channelized T1 IQ and T3 IQ 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
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

Sample Output

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 (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	<code>show interfaces (ct3-fpc/pic/port type-fpc/pic/port<:channel><:channel>)</code> <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 channelized T3 IQ interface.
Options	<p>type-fpc/pic/port:channel—Interface type. With optional corresponding channel levels, the interface type can be one of the following:</p> <ul style="list-style-type: none">• type-fpc/pic/port—For the physical channelized T3 IQ interface, type is ct3.• type-fpc/pic/port:channel—For the clear channel, type is t3. At the first level of channelization, type can be ct1 or t1.• type-fpc/pic/port:channel:channel—At the second level of channelization, type is ds. <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	show interfaces extensive (Channelized T3 IQ) (Physical) on page 351 show interfaces extensive (Channelized T1 on Channelized T3 IQ) on page 351 show interfaces extensive (DSO on Channelized T3 IQ) on page 351
Output Fields	See the output field table for the show interfaces (Channelized T1 IQ) command.

Sample Output

show interfaces extensive (Channelized T3 IQ) (Physical)

```
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 (DSO 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
...
```

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 213 • show interfaces routing
List of Sample Output	show interfaces dsc on page 355 show interfaces dsc brief on page 355 show interfaces dsc detail on page 355 show interfaces dsc extensive on page 356
Output Fields	Table 14 on page 352 lists the output fields for the show interfaces (discard) command. Output fields are listed in the approximate order in which they appear.

Table 14: 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 14: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 14: 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
Flags	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under <i>Common Output Fields Description</i> .	All levels

Table 14: Discard show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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

Sample Output

show interfaces dsc

```

user@host> show interfaces dsc
Physical interface: dsc, Enabled, Physical link is Up
  Interface index: 5, SNMP ifIndex: 5
  Type: Software-Pseudo, MTU: Unlimited
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
  Last flapped   : Never
    Input packets : 0
    Output packets: 0

  Logical interface dsc.0 (Index 66) (SNMP ifIndex 235)
    Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified
    Protocol inet, MTU: Unlimited
    Flags: None

```

show interfaces dsc brief

```

user@host> show interfaces dsc brief
Physical interface: dsc, Enabled, Physical link is Up
  Type: Software-Pseudo, Link-level type: Unspecified, MTU: Unlimited, Clocking:
  Unspecified, Speed: Unspecified
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps

  Logical interface dsc.0
    Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified
    inet

```

show interfaces dsc detail

```

user@host> show interfaces dsc detail
Physical interface: dsc, Enabled, Physical link is Up
  Interface index: 5, SNMP ifIndex: 5, Generation: 9
  Type: Software-Pseudo, Link-level type: Unspecified, MTU: Unlimited, Clocking:
  Unspecified, Speed: Unspecified
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link type      : Unspecified

```

```
Link flags      : None
Physical info   : Unspecified
Hold-times      : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Last flapped    : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes   : 0
  Output bytes  : 0
  Input packets : 0
  Output packets: 0

Logical interface dsc.0 (Index 66) (SNMP ifIndex 235) (Generation 6)
  Flags: Point-To-Point SNMP-Traps Encapsulation: Unspecified
  Protocol inet, MTU: Unlimited, Generation: 14, Route table: 0
  Flags: None
```

show interfaces dsc 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, 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 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
```

show interfaces (Fast Ethernet)

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 Fast Ethernet interface.
Options	<p><i>interface-type</i>—On M Series and T Series routers, the interface type is <i>fe-fpc/pic/port</i>. On the J Series routers, the interface type is <i>fe-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 (Fast Ethernet) on page 370</p> <p>show interfaces brief (Fast Ethernet) on page 371</p> <p>show interfaces detail (Fast Ethernet) on page 371</p> <p>show interfaces extensive (Fast Ethernet) on page 371</p>
Output Fields	<p>Table 15 on page 357 lists the output fields for the show interfaces Fast Ethernet command. Output fields are listed in the approximate order in which they appear.</p>

Table 15: 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 <i>Common Output Fields Description</i> .	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 15: 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
Link-mode	Type of link connection configured for the physical interface: Full-duplex or Half-duplex	extensive
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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the "Links Flags" section under <i>Common Output Fields Description</i> .	All levels
Wavelength	(10-Gigabit Ethernet dense wavelength-division multiplexing [DWDM] interfaces) Displays the configured wavelength, in nanometers (nm).	All levels

Table 15: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
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	(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 15: 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 15: 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 15: 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 routing device configuration, an alarm can ring the red or yellow alarm bell on the routing device, 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 provide the following statistics:</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 15: 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 15: 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 routing device 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 routing device (which the routing device 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 15: 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 15: 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 (signal) 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 15: 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 routing device 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 routing device at the other end of the fiber. The transmitted path trace value is the message that this routing device 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 15: show interfaces Fast 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 <i>Common Output Fields Description</i> .	All levels
VLAN-Tag	Rewrite profile applied to incoming or outgoing frames on the outer (Out) VLAN tag or for both the outer and inner (In) VLAN tags. <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

Table 15: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Protocol	Protocol family. Possible values are described in the “Protocol Field” section under <i>Common Output Fields Description</i> .	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	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 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 routing device.	extensive
Transit statistics	Number and rate of bytes and packets transiting the switch. <p>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.</p>	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 <i>Common Output Fields Description</i> .	detail extensive
Donor interface	(Unnumbered Ethernet) Interface from which an unnumbered Ethernet interface borrows an IPv4 address.	detail extensive none

Table 15: show interfaces Fast Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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

Sample Output

show interfaces (Fast Ethernet)

```

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

```

show interfaces brief (Fast Ethernet)

```

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

```

show interfaces detail (Fast Ethernet)

```

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

```

show interfaces extensive (Fast Ethernet)

```

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

```

```

Traffic statistics:
Input bytes :          0          0 bps
Output bytes :         42          0 bps
Input packets:         0          0 pps
Output packets:        1          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0,
  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
  FIFO errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 3, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,

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

```

show interfaces (Gigabit Ethernet)

Syntax	<pre>show interfaces <i>ge-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, T Series, and MX Series routers and EX Series switches only) Display status information about the specified Gigabit Ethernet interface.
Options	<p><i>ge-fpc/pic/port</i>—Display standard information about the specified Gigabit Ethernet interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Additional Information	In a logical system, this command displays information only about the logical interfaces and not about the physical interfaces.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> <i>Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration</i>
List of Sample Output	<p>show interfaces (Gigabit Ethernet) on page 388</p> <p>show interfaces (Gigabit Ethernet on MX Series Routers) on page 388</p> <p>show interfaces extensive (Gigabit Ethernet on MX Series Routers showing interface transmit statistics configuration) on page 389</p> <p>show interfaces brief (Gigabit Ethernet) on page 389</p> <p>show interfaces detail (Gigabit Ethernet) on page 389</p> <p>show interfaces extensive (Gigabit Ethernet IQ2) on page 391</p> <p>show interfaces (Gigabit Ethernet Unnumbered Interface) on page 394</p> <p>show interfaces (ACI Interface Set Configured) on page 394</p>
Output Fields	<p>Table 16 on page 374 describes the output fields for the show interfaces (Gigabit Ethernet) command. Output fields are listed in the approximate order in which they appear. For Gigabit Ethernet IQ and IQE PICs, the traffic and MAC statistics vary by interface type. For more information, see Table 17 on page 387.</p>

Table 16: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels

Table 16: 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 <i>Common Output Fields Description</i> .	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 (ms).	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). The value in this field also includes the Layer 2 overhead bytes for ingress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level.	None
Output Rate	Output rate in bps and pps. The value in this field also includes the Layer 2 overhead bytes for egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level.	None
Statistics last cleared	Time when the statistics for the interface were last set to zero.	detail extensive
Egress accounting overhead	Layer 2 overhead in bytes that is accounted in the interface statistics for egress traffic.	detail extensive
Ingress accounting overhead	Layer 2 overhead in bytes that is accounted in the interface statistics for ingress traffic.	detail extensive

Table 16: show interfaces Gigabit Ethernet 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. The value in this field also includes the Layer 2 overhead bytes for ingress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • Output bytes—Number of bytes transmitted on the interface. The value in this field also includes the Layer 2 overhead bytes for egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • 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
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 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 16: 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. <p>NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the Drops field does not always use the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.</p> <ul style="list-style-type: none"> • 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. <p>NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the Dropped packets field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.</p>	detail extensive
Ingress queues	Total number of ingress queues supported on the specified interface. Displayed on IQ2 interfaces.	extensive

Table 16: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Queue counters (Ingress)	CoS queue number and its associated user-configured forwarding class name. Displayed on IQ2 interfaces. <ul style="list-style-type: none"> • Queued packets—Number of queued packets. • Transmitted packets—Number of transmitted packets. • Dropped packets—Number of packets dropped by the ASIC's RED mechanism. 	extensive
Active alarms and Active defects	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 . <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
Interface transmit statistics	(On MX Series devices) Status of the interface-transmit-statistics configuration: Enabled or Disabled. <ul style="list-style-type: none"> • Enabled—When the interface-transmit-statistics statement is included in the configuration. If this is configured, the interface statistics show the actual transmitted load on the interface. • Disabled—When the interface-transmit-statistics statement is not included in the configuration. If this is not configured, the interface statistics show the offered load on the interface. 	detail extensive
OTN FEC statistics	The forward error correction (FEC) counters provide the following statistics: <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. 	detail extensive
PCS statistics	(10-Gigabit Ethernet interfaces) Displays Physical Coding Sublayer (PCS) fault conditions from the WAN PHY or the LAN PHY device. <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 the PCS receiver is operating in normal mode. 	detail extensive

Table 16: 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—There are two possible conditions regarding the number of oversized frames: <ul style="list-style-type: none"> • Packet length exceeds 1518 octets, or • Packet length exceeds MRU • 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. <p>NOTE: The 20-port Gigabit Ethernet MIC (MIC-3D-20GE-SFP) does not have hardware counters for VLAN frames. Therefore, the VLAN tagged frames field displays 0 when the show interfaces command is executed on a 20-port Gigabit Ethernet MIC. In other words, the number of VLAN tagged frames cannot be determined for the 20-port Gigabit Ethernet MIC.</p> <ul style="list-style-type: none"> • 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 16: 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 16: 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. Any 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 16: 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 (signal) 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 16: 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—Information from the remote Ethernet device: <ul style="list-style-type: none"> • Link mode—Depending on the capability of the link partner, either Full-duplex or Half-duplex. • Flow control—Types of flow control supported by the link partner. For Gigabit Ethernet interfaces, types are Symmetric (link partner supports PAUSE on receive and transmit), Asymmetric (link partner supports PAUSE on transmit), Symmetric/Asymmetric (link partner supports PAUSE on receive and transmit or only PAUSE on transmit), and None (link partner does not support flow control). • 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 local Ethernet device: <ul style="list-style-type: none"> • Flow control—Types of flow control supported by the local device. For Gigabit Ethernet interfaces, advertised capabilities are Symmetric/Asymmetric (local device supports PAUSE on receive and transmit or only PAUSE on receive) and None (local device does not support flow control). Depending on the result of the negotiation with the link partner, local resolution flow control type will display Symmetric (local device supports PAUSE on receive and transmit), Asymmetric (local device supports PAUSE on receive), and None (local device does not support flow control). • 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	(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.	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 16: show interfaces Gigabit 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 <i>Common Output Fields Description</i> .	All levels

Table 16: 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
ACI VLAN: Dynamic Profile	Name of the dynamic profile that defines the agent circuit identifier (ACI) interface set. If configured, the ACI interface set enables the underlying Ethernet interface to create dynamic VLAN subscriber interfaces based on ACI information.	brief detail extensive none
Protocol	Protocol family. Possible values are described in the “Protocol Field” section under <i>Common Output Fields Description</i> .	detail extensive none
MTU	Maximum transmission unit size on the logical interface.	detail extensive none
Dynamic Profile	(MX Series routers with Trio MPCs only) Name of the dynamic profile that was used to create this interface configured with a Point-to-Point Protocol over Ethernet (PPPoE) family.	detail extensive none
Service Name Table	(MX Series routers with Trio MPCs only) Name of the service name table for the interface configured with a PPPoE family.	detail extensive none
Max Sessions	(MX Series routers with Trio MPCs only) Maximum number of PPPoE logical interfaces that can be activated on the underlying interface.	detail extensive none

Table 16: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Duplicate Protection	(MX Series routers with Trio MPCs only) 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.	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. The value in this field also includes the Layer 2 overhead bytes for ingress or egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • Input packets, Output packets—Number of packets received and transmitted on the interface set. 	detail extensive
IPv6 transit statistics	Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled.	extensive
Local statistics	Number and rate of bytes and packets destined to the router.	extensive
Transit statistics	<p>Number and rate of bytes and packets transiting the switch.</p> <p>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.</p>	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 <i>Common Output Fields Description</i> .	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 parentheses next to all interfaces.	detail extensive

Table 16: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 parentheses 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 <i>Common Output Fields Description</i> .	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 the address flag. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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

Table 17: 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 include 6 bytes for the destination MAC address plus 4 bytes for VLAN plus 2 bytes for the Ethernet type.

Table 17: Gigabit Ethernet IQ PIC Traffic and MAC Statistics by Interface Type (*continued*)

Interface Type	Sample Command	Byte and Octet Counts Include	Comments
Outbound logical interface	show interfaces ge-0/0/0.50 extensive	Traffic statistics: Input bytes: 478 bytes per packet, representing the Layer 3 packet	

Sample Output

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
  Egress accounting overhead: 100
  Ingress accounting overhead: 90
  Input packets : 0
  Output packets: 0
  Protocol ccc, MTU: 1522
  Flags: Is-Primary

```

show interfaces (Gigabit Ethernet on MX Series Routers)

```

user@host> show interfaces ge-2/2/2
Physical interface: ge-2/2/2, Enabled, Physical link is Up
  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
  Egress accounting overhead: 100
  Ingress accounting overhead: 90
  Input packets : 0
  Output packets: 0
  Protocol aenet, AE bundle: ae0.0    Link Index: 4

```

show interfaces extensive (Gigabit Ethernet on MX Series Routers showing interface transmit statistics configuration)

```

user@host> show interfaces ge-2/1/2 extensive | match "output|interface"
Physical interface: ge-2/1/2, Enabled, Physical link is Up
Interface index: 151, SNMP ifIndex: 530, Generation: 154
Interface flags: SNMP-Traps Internal: 0x4000
Output bytes      :          240614363944          772721536 bps
Output packets:    3538446506             1420444 pps
Direction : Output
Interface transmit statistics: Enabled

Logical interface ge-2/1/2.0 (Index 331) (SNMP ifIndex 955) (Generation 146)
Output bytes      :          195560312716          522726272 bps
Output packets:    4251311146             1420451 pps

```

show interfaces brief (Gigabit Ethernet)

```

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

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

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

```

show interfaces detail (Gigabit Ethernet)

```

user@host> show interfaces ge-3/0/2 detail
Physical interface: ge-3/0/2, Enabled, Physical link is Up
Interface index: 167, SNMP ifIndex: 35, Generation: 177
Link-level type: 52, MTU: 1522, Speed: 1000mbps, Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
Remote fault: Online
Device flags      : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags        : None
CoS queues        : 4 supported, 4 maximum usable queues
Hold-times        : Up 0 ms, Down 0 ms

```

```

Current address: 00:05:85:4a:e9:7c, Hardware address: 00:05:85:4a:e9:7c
Last flapped : 2006-08-09 17:17:00 PDT (01:31:33 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Ingress traffic statistics at Packet Forwarding Engine:
Input bytes : 0 0 bps
Input packets: 0 0 pps
Drop bytes : 0 0 bps
Drop packets: 0 0 pps
Ingress queues: 4 supported, 4 in use
Queue counters:

```

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

```

Egress queues: 4 supported, 4 in use
Queue counters:

```

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

```

Active alarms : None
Active defects : None

Logical interface ge-3/0/2.0 (Index 72) (SNMP ifIndex 69) (Generation 140)
Flags: SNMP-Traps 0x4000
VLAN-Tag [0x8100.512 0x8100.513 ] In(pop-swap 0x8100.530)
Out(swap-push 0x8100.512 0x8100.513)
Encapsulation: VLAN-CCC
Egress accounting overhead: 100
Ingress accounting overhead: 90
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Transit statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps
Protocol ccc, MTU: 1522, Generation: 149, Route table: 0

```

Flags: Is-Primary

Logical interface ge-3/0/2.32767 (Index 71) (SNMP ifIndex 70)
(Generation 139)
Flags: SNMP-Traps 0x4000 VLAN-Tag [0x0000.0] Encapsulation: ENET2
Traffic statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Local statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Transit statistics:
Input bytes : 0 0 bps
Output bytes : 0 0 bps
Input packets: 0 0 pps
Output packets: 0 0 pps

show interfaces extensive (Gigabit Ethernet IQ2)

```
user@host> show interfaces ge-7/1/3 extensive
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      500000000   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      500000000   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 16 on page 374](#).

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 (ACI Interface Set Configured)

```
user@host> show interfaces ge-1/0/0.4001
Logical interface ge-1/0/0.4001 (Index 340) (SNMP ifIndex 548)
  Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.4001 ] Encapsulation: PPP-over-

Ethernet
ACI VLAN:
  Dynamic Profile: aci-vlan-set-profile
  PPPoE:
    Dynamic Profile: aci-vlan-pppoe-profile,
    Service Name Table: None,
    Max Sessions: 32000, Max Sessions VSA Ignore: Off,
    Duplicate Protection: On, Short Cycle Protection: Off,
    AC Name: nbc
  Input packets : 9
  Output packets: 8
  Protocol multiservice, MTU: Unlimited
```

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>bc-pim/0/port:channel—Display standard information about the specified ISDN B-channel interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display the interface description string.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Additional Information	There are no user-configurable fields on B-channel interfaces.
Required Privilege Level	view
List of Sample Output	show interfaces (ISDN B-Channel) on page 398 show interfaces brief (ISDN B-Channel) on page 399 show interfaces detail (ISDN B-Channel) on page 399 show interfaces extensive (ISDN B-Channel) on page 399
Output Fields	Table 18 on page 395 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 18: 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 <i>Common Output Fields Description</i> .	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 18: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 18: 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 18: 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 <i>Common Output Fields Description</i> .	All levels
Encapsulation	Encapsulation on the logical interface.	All levels

Sample Output

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 (ISDN B-Channel)

```
user@host> show interfaces bc-4/0/0:1 brief
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 (ISDN B-Channel)

```
user@host> show interfaces bc-4/0/0:1 detail
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 (ISDN B-Channel)

```
user@host> show interfaces bc-4/0/0:1 extensive
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, Runt: 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      Buffer  Priority  Limit
                           %      bps      %      usec
  0 best-effort           95      60800  95      0      low  none
  3 network-control        5       3200   5      0      low  none
Logical interface bc-4/0/0:1.0 (Index 74) (SNMP ifIndex 79) (Generation 140)
  Flags: Point-To-Point SNMP-Traps Encapsulation: 64
```


show interfaces (ISDN BRI)

Syntax	<pre>show interfaces br-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 only) Display status information about the specified ISDN Basic Rate Interface (BRI) interface.
Options	<p>br-pim/0/port—Display standard information about the specified ISDN BRI interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display the interface description string.</p> <p>media—(Optional) Display media-specific information.</p> <p>snmp-index snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces (ISDN BRI) on page 403</p> <p>show interfaces brief (ISDN BRI) on page 404</p> <p>show interfaces detail (ISDN BRI) on page 404</p> <p>show interfaces extensive (ISDN BRI) on page 404</p>
Output Fields	Table 19 on page 401 lists the output fields for the show interfaces (ISDN BRI) command. Output fields are listed in the approximate order in which they appear.

Table 19: 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 <i>Common Output Fields Description</i> .	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 19: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 19: ISDN BRI 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

Sample Output

show interfaces (ISDN BRI)

```

user@host> show interfaces br-4/0/0
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 (ISDN BRI)

```
user@host> show interfaces brief br-4/0/0
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 (ISDN BRI)

```
user@host> show interfaces br-4/0/0 detail
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 (ISDN BRI)

```
user@host> show interfaces br-4/0/0 extensive
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	<pre>show interfaces dc-pim/0/port:0 <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 specified ISDN D-channel interface.
Options	<p>dc-pim/0/port:0—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	show interfaces (ISDN D-Channel) on page 408 show interfaces brief (ISDN D-Channel) on page 408 show interfaces detail (ISDN D-Channel) on page 409 show interfaces extensive (ISDN D-Channel) on page 409
Output Fields	Table 20 on page 405 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 20: 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 <i>Common Output Fields Description</i> .	All levels
Interface index	Physical interface index number that reflects its initialization sequence.	detail extensive none

Table 20: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	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 20: ISDN D-Channel 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 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 Junos does not support. Resource errors—Sum of transmit drops. 	extensive
Output errors	<ul style="list-style-type: none"> Carrier transitions —Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly, possibly once every 10 seconds, the cable, the remote system, or the interface is malfunctioning. Errors—Sum of outgoing frame aborts and FCS errors. Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet dropped by the ASIC Red mechanism. MTU errors—Number of packets larger than the MTU threshold. Resource errors—Sum of transmit drops. 	extensive
ISDN Alarms	ISDN alarms.	All levels
ISDN Media	<ul style="list-style-type: none"> LOF—Loss of frame LOS—Loss of signal 	extensive
Logical Interface		
Logical interface	Name of the logical interface.	All levels
Index	Index number of the logical interface (which reflects its initialization sequence).	detail extensive none
SNMP ifIndex	SNMP interface index number for the logical interface.	detail extensive none
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive
Flags	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under <i>Common Output Fields Description</i> .	All levels

Table 20: ISDN D-Channel show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Encapsulation	Encapsulation on the logical interface.	All levels
Input packets	Number of packets received on the logical interface.	None specified
Output packets	Number of packets transmitted on the logical interface.	None specified
Traffic statistics	<p>Total number of bytes and packets received and transmitted on the logical interface. These statistics are the sum of the local and transit statistics. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.</p> <ul style="list-style-type: none"> • Input bytes—Number of bytes received on the interface. • Output bytes—Number of bytes transmitted on the interface. • Input packets—Number of packets received on the logical interface. • Output packets—Number of packets transmitted on the logical interface 	detail extensive
Local statistics	Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes awhile (generally, less than 1 second) for this counter to stabilize.	detail extensive

Sample Output

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><i>brief detail extensive terse</i>—(Optional) Display brief interface information.</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 Dialer) on page 416</p> <p>show interfaces brief (ISDN Dialer) on page 417</p> <p>show interfaces detail (ISDN Dialer) on page 417</p> <p>show interfaces extensive (ISDN Dialer) on page 418</p>
Output Fields	<p>Table 21 on page 411 lists the output fields for the show interfaces (ISDN dialer) command. Output fields are listed in the approximate order in which they appear.</p>

Table 21: 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 <i>Common Output Fields Description</i> .	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 21: 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 21: 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 <i>Common Output Fields Description</i> .	All levels
Encapsulation	Encapsulation on the logical interface.	All levels

Table 21: 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 21: 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 21: 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 <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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

Sample Output

show interfaces (ISDN Dialer)

```

user@host>show interfaces dl0
Physical interface: dl0, 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 dl0.0 (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 dl0 extensive
```

```

Physical interface: d10, Enabled, Physical link is Up
  Interface index: 153, SNMP ifIndex: 77, Generation: 154
  Type: 27, Link-level type: PPP, MTU: 1504, Clocking: Unspecified,
  Speed: Unspecified
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Link flags     : Keepalives
  Physical info  : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: Unspecified, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :          131116          0 bps
    Output bytes  :           0          0 bps
    Input packets :          10847          0 pps
    Output packets:           0          0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 0,
    Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
    Resource errors: 0

Logical interface d10.0 (Index 76) (SNMP ifIndex 78) (Generation 142)
  Flags: Point-To-Point SNMP-Traps 0x4000 LinkAddress 23-0 Encapsulation: PPP
  Dialer:
    State: Active, Dial pool: 10
    Dial strings: 5551212
    Subordinate interfaces: bc-4/0/0:1 (Index 151)
    Activation delay: 0, Deactivation delay: 0
    Initial route check delay: 120
    Redial delay: 3
    Callback wait period: 5
    Load threshold: 0, Load interval: 60
  Bandwidth: 64kbps
  Traffic statistics:
    Input bytes   :          1092
    Output bytes  :         131459
    Input packets :           13
    Output packets:         10848
  Local statistics:
    Input bytes   :          1092
    Output bytes  :         131459
    Input packets :           13
    Output packets:         10848
  Transit statistics:
    Input bytes   :           0          0 bps
    Output bytes  :           0          0 bps
    Input packets :           0          0 pps
    Output packets:           0          0 pps
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 5413 (last seen 00:00:07 ago)
    Output: 5417 (last sent 00:00:06 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured

```

```
CHAP state: Closed
Protocol inet, MTU: 1500, Generation: 142, Route table: 0
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.0.40.1, Local: 10.0.40.2, Broadcast: Unspecified,
    Generation: 142
```

show interfaces (M Series and T Series Routers, and PTX Series Packet Transport Routers Management and Internal Ethernet)

Syntax	<pre>show interfaces <i>interface-name</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Syntax (PTX Series Packet Transport Routers)	<pre>show interfaces <i>interface-name</i> <brief detail extensive terse> <descriptions> <statistics></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced on PTX Series Packet Transport Routers for Junos OS Release 12.1.</p>
Description	(M Series, T Series, TX Matrix Plus, and PTX Series devices only) Display status information about the management Ethernet and internal Ethernet interfaces.
Options	<p>interface-name—Specify one of the following management interface names: fxp0, fxp1, fxp2, ixgbe0, ixgbe1, bcm0, em0, or em1. For supported Ethernet interface by chassis and Routing Engine, see <i>Supported Routing Engines by Chassis</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.</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 425</p> <p>show interfaces (Management Ethernet) on page 425</p> <p>show interfaces (Management Ethernet [TX Matrix Plus Router]) on page 425</p> <p>show interfaces (Management Ethernet [PTX Series Packet Transport Routers]) on page 426</p> <p>show interfaces detail (Management Ethernet) on page 426</p> <p>show interfaces detail (Management Ethernet [TX Matrix Plus Router]) on page 427</p> <p>show interfaces detail (Management Ethernet [PTX Packet Transport Routers]) on page 427</p> <p>show interfaces extensive (Management Ethernet) on page 428</p> <p>show interfaces extensive (Management Ethernet [TX Matrix Plus Router]) on page 429</p>

[show interfaces extensive \(Management Ethernet \[PTX Series Packet Transport Routers\]\) on page 430](#)
[show interfaces brief \(Management Ethernet\) on page 430](#)
[show interfaces brief \(Management Ethernet \[TX Matrix Plus Router\]\) on page 431](#)
[show interfaces brief \(Management Ethernet \[PTX Series Packet Transport Routers\]\) on page 431](#)
[show interfaces \(Internal Ethernet\) on page 431](#)
[show interfaces \(Internal Ethernet \[TX Matrix Plus Router\]\) on page 432](#)
[show interfaces detail \(Internal Ethernet\) on page 432](#)
[show interfaces detail \(Internal Ethernet \[TX Matrix Plus Router\]\) on page 433](#)
[show interfaces extensive \(internal Ethernet\) on page 434](#)
[show interfaces extensive \(internal Ethernet \[TX Matrix Plus Router\]\) on page 435](#)

Output Fields Table 22 on page 422 lists the output fields for the **show interfaces** (management) command on the M Series routers, T Series routers, TX Matrix Plus routers, and PTX Series Packet Transport Routers. Output fields are listed in the approximate order in which they appear.

Table 22: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels

Table 22: M Series and T Series Router Management and Internal Ethernet show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Link type	Data transmission type.	detail extensive none
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	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
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

Table 22: M Series and T Series Router Management and Internal 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. • 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 “Device Flags” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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 22: M Series and T Series Router Management and Internal Ethernet 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

Sample Output

show interfaces brief (Management Ethernet)

```

user@host> show interfaces fxp0 brief
Physical interface: fxp0, Enabled, Physical link is Up
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps

Logical interface fxp0.0
  Flags: SNMP-Traps Encapsulation: ENET2
  inet 192.168.70.143/21

```

show interfaces (Management Ethernet)

```

user@host> show interfaces fxp0
Physical interface: fxp0, Enabled, Physical link is Up
  Interface index: 1, SNMP ifIndex: 1
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Half-Duplex
  Current address: 00:a0:a5:56:01:89, Hardware address: 00:a0:a5:56:01:89
  Last flapped   : Never
  Input packets  : 80804
  Output packets : 1105

Logical interface fxp0.0 (Index 2) (SNMP ifIndex 13)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500
  Flags: Is-Primary
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.64/21, Local: 192.168.70.143,
    Broadcast: 192.168.71.255

```

show interfaces (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 (Management Ethernet [PTX Series Packet Transport Routers])

```
user@host> show interfaces em0
Physical interface: em0, Enabled, Physical link is Up
  Interface index: 8, SNMP ifIndex: 0
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Current address: 00:80:f9:25:00:1b, Hardware address: 00:80:f9:25:00:1b
  Last flapped   : Never
  Input packets  : 212581
  Output packets : 71

  Logical interface em0.0 (Index 3) (SNMP ifIndex 0)
  Flags: SNMP-Traps Encapsulation: ENET2
  Input packets : 212551
  Output packets: 71
  Protocol inet, MTU: 1500
  Flags: Is-Primary
  Addresses, Flags: Is-Default Is-Preferred Is-Primary
    Destination: 192.168.3/24, Local: 192.168.3.30,
    Broadcast: 192.168.3.255
```

show interfaces detail (Management Ethernet)

```
user@host> show interfaces fxp0 detail
Physical interface: fxp0, Enabled, Physical link is Up
  Interface index: 1, SNMP ifIndex: 1, Generation: 0
  Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
  Speed: 100mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Half-Duplex
  Physical info   : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:a0:a5:56:01:89, Hardware address: 00:a0:a5:56:01:89
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 6484031
    Output bytes : 167503
    Input packets: 81008
    Output packets: 1110

  Logical interface fxp0.0 (Index 2) (SNMP ifIndex 13) (Generation 1)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500, Generation: 6, Route table: 0
  Flags: Is-Primary
```

Addresses, Flags: Is-Preferred Is-Primary
 Destination: 192.168.64/21, Local: 192.168.70.143,
 Broadcast: 192.168.71.255, Generation: 1

show interfaces 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 detail (Management Ethernet [PTX Packet Transport Routers])

```
user@host> show interfaces detail em0
Physical interface: em0, Enabled, Physical link is Up
  Interface index: 8, SNMP ifIndex: 0, 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: 00:80:f9:25:00:1b, Hardware address: 00:80:f9:25:00:1b
Alternate link address: Unspecified
Last flapped    : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          15255909
  Output bytes :             4608
  Input packets:          214753
  Output packets:             72
IPv6 transit statistics:
  Input bytes :          0
  Output bytes :          0
  Input packets:          0
  Output packets:          0

Logical interface em0.0 (Index 3) (SNMP ifIndex 0) (Generation 1)
Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
  Input bytes :          14394630
  Output bytes :             3024
  Input packets:          214723
  Output packets:             72
Local statistics:
  Input bytes :          14394630
  Output bytes :             3024
  Input packets:          214723
  Output packets:             72
Protocol inet, MTU: 1500, Generation: 1, Route table: 0
Flags: Is-Primary
Addresses, Flags: Is-Default Is-Preferred Is-Primary
  Destination: 192.168.3/24, Local: 192.168.3.30,
  Broadcast: 192.168.3.255, Generation: 1
```

show interfaces extensive (Management Ethernet)

```
user@host> show interfaces fxp0 extensive
Physical interface: fxp0, Enabled, Physical link is Up
Interface index: 1, SNMP ifIndex: 1, Generation: 0
Type: Ethernet, Link-level type: Ethernet, MTU: 1514, Clocking: Unspecified,
Speed: 100mbps
Device flags      : Present Running
Interface flags: SNMP-Traps
Link type         : Half-Duplex
Physical info      : Unspecified
Hold-times        : Up 0 ms, Down 0 ms
Current address: 00:a0:a5:56:01:89, Hardware address: 00:a0:a5:56:01:89
Alternate link address: Unspecified
Last flapped      : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          6678904
  Output bytes :          169657
  Input packets:          83946
  Output packets:          1127
Input errors:
  Errors: 12, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0
```

```

Logical interface fxp0.0 (Index 2) (SNMP ifIndex 13) (Generation 1)
  Flags: SNMP-Traps Encapsulation: ENET2
  Protocol inet, MTU: 1500, Generation: 6, Route table: 0
    Flags: Is-Primary
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.168.64/21, Local: 192.168.70.143,
    Broadcast: 192.168.71.255, Generation: 1

```

show interfaces 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 extensive (Management Ethernet [PTX Series Packet Transport Routers])

```
user@host> show interfaces extensive em0
Physical interface: em0, Enabled, Physical link is Up
  Interface index: 8, SNMP ifIndex: 0, 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: 00:80:f9:25:00:1b, Hardware address: 00:80:f9:25:00:1b
  Alternate link address: Unspecified
  Last flapped   : Never
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :          15236459
    Output bytes  :           4608
    Input packets :         214482
    Output packets:           72
  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 0) (Generation 1)
  Flags: SNMP-Traps Encapsulation: ENET2
  Traffic statistics:
    Input bytes   :         14376264
    Output bytes  :           3024
    Input packets :         214452
    Output packets:           72
  Local statistics:
    Input bytes   :         14376264
    Output bytes  :           3024
    Input packets :         214452
    Output packets:           72
  Protocol inet, MTU: 1500, Generation: 1, Route table: 0
  Flags: Is-Primary
  Addresses, Flags: Is-Default Is-Preferred Is-Primary
    Destination: 192.168.3/24, Local: 192.168.3.30,
    Broadcast: 192.168.3.255, 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 brief (Management Ethernet [PTX Series Packet Transport Routers])

```

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: 1000mbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps

Logical interface em0.0
  Flags: SNMP-Traps Encapsulation: ENET2
  inet 192.168.3.30/24

```

```

root@aboslutely> show interfaces em0 terse
Interface      Admin Link Proto  Local      Remote
em0            up    up
em0.0          up    up  inet    192.168.3.30/24

```

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 (SONET/SDH)

Syntax	<pre>show interfaces so-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	(M Series and T Series routers only) Display status information about the specified SONET/SDH interface.
Options	<p>so-fpc/pic/port—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 snmp-index—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces (SDH Mode, PPP) on page 450</p> <p>show interfaces brief (SDH Mode, PPP) on page 451</p> <p>show interfaces detail (SDH Mode, PPP) on page 451</p> <p>show interfaces extensive (SDH Mode, PPP) on page 452</p> <p>show interfaces brief (SONET Mode, Frame Relay) on page 454</p> <p>show interfaces (SONET Mode, Frame Relay) on page 454</p> <p>show interfaces detail (SONET Mode, Frame Relay) on page 455</p> <p>show interfaces extensive (SONET Mode, Frame Relay) on page 457</p> <p>show interfaces extensive (OC768-over-4xOC192 Mode) on page 459</p> <p>show interfaces detail (IPv6 Tracking) on page 462</p> <p>show interfaces (shared interface) on page 463</p>
Output Fields	Table 23 on page 437 lists the output fields for the show interfaces (SONET/SDH) command. Output fields are listed in the approximate order in which they appear.

Table 23: 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 23: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels

Table 23: 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 23: 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 23: 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 23: 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 23: 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 23: 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 23: 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 (signal) 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 23: 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 23: 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 23: 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 <i>Common Output Fields Description</i> .	All levels
Encapsulation	Encapsulation on the logical interface.	All levels
PPP parameters	The PPP loopback clear timer value.	extensive

Table 23: 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 <i>Common Output Fields Description</i> .	detail extensive none

Table 23: 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 <i>Common Output Fields Description</i> .	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

Sample Output

show interfaces (SDH Mode, PPP)

```

user@host> show interfaces so-0/0/0
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, mp1s:
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 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 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 .....
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 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, mp1s:
  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 (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 <i>se-fpc/pic/port</i>. On the J Series routers, the interface type is <i>se-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 (Serial, EIA-530) on page 471</p> <p>show interfaces brief (Serial, EIA-530) on page 471</p> <p>show interfaces detail (Serial, EIA-530) on page 472</p> <p>show interfaces extensive (Serial, EIA-530) on page 472</p> <p>show interfaces (Serial, V.35) on page 473</p> <p>show interfaces brief (Serial, V.35) on page 474</p> <p>show interfaces detail (Serial, V.35) on page 474</p> <p>show interfaces extensive (Serial, V.35) on page 475</p> <p>show interfaces statistics detail (RS 449) on page 476</p>
Output Fields	Table 24 on page 465 lists the output fields for the show interfaces (Serial) command. Output fields are listed in the approximate order in which they appear.

Table 24: show interfaces (Serial) Output Fields

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

Table 24: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	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 24: 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 24: 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 24: 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 24: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	detail extensive

Table 24: 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 <i>Common Output Fields Description</i> .	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

Sample Output

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, mp1s:
  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, mpls:
  Not-configured
  CHAP state: Closed
  CoS queues   : 8 supported, 8 maximum usable queues
  Last flapped : 2006-04-26 15:10:18 PDT (00:06:02 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :          928          40 bps
    Output bytes  :         1023          48 bps
    Input packets :           76           0 pps
    Output packets:           77           0 pps
  Serial media information:
    Line protocol: eia530
    Resync history:
      Sync loss count: 0
    Data signal:
      Rx Clock: OK
    Control signals:
      Local mode: DTE
      To DCE: DTR: up, RTS: up
      From DCE: CTS: up, DCD: up, DSR: up
    Clocking mode: loop-timed
    Clock rate: 8.0 MHz
    Loopback: none
    Tx clock: non-invert
    Line encoding: nrz

  Logical interface se-5/0/1.0 (Index 71) (SNMP ifIndex 45) (Generation 9)
    Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
    Protocol inet, MTU: 1500, Generation: 15, Route table: 0
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 12.0.0.0/30, Local: 12.0.0.1, Broadcast: 12.0.0.3,
      Generation: 23
```

show interfaces extensive (Serial, EIA-530)

```
user@host> show interfaces se-5/0/1 extensive
Physical interface: se-5/0/1, Enabled, Physical link is Up
  Interface index: 144, SNMP ifIndex: 41, Generation: 25
  Type: Serial, Link-level type: PPP, MTU: 1504, Maximum speed: 16384kbps
  Device flags   : Present Running
  Interface flags: Point-To-Point Internal: 0x4000
```



```

Link flags      : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 40 (last seen 00:00:00 ago)
  Output: 37 (last sent 00:00:09 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
CoS queues      : 8 supported, 8 maximum usable queues
Last flapped    : 2006-04-26 15:10:18 PDT (00:06:28 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes :          988          40 bps
  Output bytes :         1088          48 bps
  Input packets:           81           0 pps
  Output packets:          82           0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 2, Runts: 0, Giants: 0,
  Policed discards: 0, Resource errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, MTU errors: 0,
  Resource errors: 0
Serial media information:
  Line protocol: eia530
  Resync history:
    Sync loss count: 0
  Data signal:
    Rx Clock: OK
  Control signals:
    Local mode: DTE
    To DCE: DTR: up, RTS: up
    From DCE: CTS: up, DCD: up, DSR: up
  Clocking mode: loop-timed
  Clock rate: 8.0 MHz
  Loopback: none
  Tx clock: non-invert
  Line encoding: nrz
Packet Forwarding Engine configuration:
  Destination slot: 5, PLP byte: 1 (0x00)
CoS 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

show interfaces (T1, E1, or DS)

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 T1, E1, or DS interface.
Options	<p><i>interface-type</i>—On ACX Series, M Series, MX Series, and T Series routers, the T1 interface type is <i>t1-fpc/pic/port</i>, whereas the E1 interface type is <i>e1-fpc/pic/port</i>, and DS interface type is <i>ds-fpc/pic/port:<channel></i>. On the J Series routers, the T1 interface type is <i>t1-pim/O/port</i>, whereas the E1 interface type is <i>e1-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
Related Documentation	<ul style="list-style-type: none">• Understanding Interfaces on ACX Series Universal Access Routers
List of Sample Output	show interfaces (T1, IMA Link) on page 490 show interfaces (T1, PPP) on page 491 show interfaces detail (T1, PPP) on page 491 show interfaces extensive (T1 CRC Errors) on page 492 show interfaces extensive (T1, PPP) on page 492 show interfaces (E1, Frame Relay) on page 494 show interfaces detail (E1, Frame Relay) on page 495 show interfaces extensive (E1, Frame Relay) on page 496 show interfaces (E1, IMA Link) on page 498 show interfaces extensive (T1, TDM-CCC-SATOP) on page 499 show interfaces extensive (DS, TDM-CCC-CESoPSN) on page 500
Output Fields	Table 25 on page 479 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 25: T1 or E1 show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical interface	Name of the physical interface.	All levels
Enabled	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	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 for the E1 interface on the link: G704 , G704-NO-CRC4 , or Unframed . The default is G704 . Physical layer framing format used for the T1 interface on the link: SF and ESF . The default is ESF .	All levels
Device flags	Information about the physical device. Possible values are described in the “Device Flags” section under <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.	detail extensive

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
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

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
IMA link media	<p>IMA Link Media Status, which provides the seconds and count state for the following link media parameters:</p> <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
Keepalive settings	<p>(PPP and HDLC) Configured settings for keepalives.</p> <ul style="list-style-type: none"> • interval seconds—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds. • down-count number—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is 1 through 255, with a default of 3. • up-count number—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is 1 through 255, with a default of 1. 	detail extensive none
Keepalive statistics	<p>(PPP and HDLC) Information about keepalive packets. (When no level of output is specified, the word statistics is not part of the field name and the last seen text is not displayed.)</p> <ul style="list-style-type: none"> • Input—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> • (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>. • Output—Number of keepalive packets sent by PPP and how long ago the last keepalive packets were sent and received. <ul style="list-style-type: none"> • (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>. 	detail extensive none

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
LMI settings	<p>(Frame Relay) Settings for Local Management Interface (LMI) which can be either ANSI LMI settings or ITU LMI settings. ANSI LMI settings is the default. The format is (ANSI or ITU) LMI settings: value, value... xx seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> • n391dte—DTE full status polling interval (1–255) • n392dce—DCE error threshold (1–10) • n392dte—DTE error threshold (1–10) • n393dce—DCE monitored event count (1–10) • n393dte—DTE monitored event count (1–10) • t391dte—DTE polling timer (5–30 seconds) • t392dce—DCE polling verification timer (5–30 seconds) 	detail extensive none
LMI	<p>(Frame Relay) Local Management Interface (LMI) packet statistics:</p> <ul style="list-style-type: none"> • Input—Number of packets coming in on the interface (<i>nn</i>) and how much time has passed since the last packet arrived. The format is Input: nn (last seen hh:mm:ss ago). • Output—Number of packets sent out on the interface (<i>nn</i>) and how much time has passed since the last packet was sent. The format is Output: nn (last sent hh:mm:ss ago). 	detail extensive none
DTE statistics	<p>(Frame Relay) Statistics about messages transmitted from the data terminal equipment (DTE) to the data communications equipment (DCE):</p> <ul style="list-style-type: none"> • Enquiries sent—Number of link status enquiries sent from the DTE to the DCE. • Full enquiries sent—Number of full enquiries sent from the DTE to the DCE. • Enquiry responses received—Number of enquiry responses received by the DTE from the DCE. • Full enquiry responses received—Number of full enquiry responses sent from the DTE to the DCE. 	detail extensive none
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 25: T1 or E1 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 Local Management Interface (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	(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) 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 is not yet sent. • Chap-Chal-sent—Challenge was sent. • Chap-Resp-received—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.) • Chap-Resp-sent—Response was sent for the challenge received. • Down—CHAP authentication is incomplete (not yet completed or has failed). • Not-configured—CHAP is not configured on the interface. • Opened—CHAP authentication was successful. 	detail extensive none
Last flapped	Date, time, and how long ago the interface went from down to up. The format is Last flapped: 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 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS Queues	Number of CoS queues configured.	detail extensive none
Input rate	Input rate in bits per second (bps) and packets per second (pps).	None specified
Output rate	Output rate in bps and pps.	None specified
Statistics last cleared	Time when the statistics for the interface were last set to zero.	detail extensive
Traffic statistics	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> • Input bytes—Number of bytes received on the interface. • Output bytes—Number of bytes transmitted on the interface. • Input packets—Number of packets received on the interface • Output packets—Number of packets transmitted on the interface. 	detail extensive
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

Table 25: T1 or E1 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 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
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

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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—Bursty errored seconds • SES—Severely errored seconds • SEFS—Severely errored framing seconds • UAS—Unavailable seconds 	extensive
SAToP Configuration	<p>Information about the SAToP configuration.</p> <ul style="list-style-type: none"> • payload-size—Configure the payload size, in bytes (from 32 through 1024 bytes). • idle-pattern—An 8-bit hexadecimal pattern to replace TDM data in a lost packet (from 0 through 255). • jitter-buffer-packets—Number of packets in the jitter buffer (from 1 through 64 packets). • jitter-buffer-latency—Time delay in the jitter buffer (from 1 through 1000 milliseconds). • excessive-packet-loss-rate—Set packet loss options. The options are groups, sample-period, and threshold. • sample-period—Time required to calculate excessive packet loss rate (from 1000 through 65,535 milliseconds). • threshold—Percentile designating the threshold of excessive packet loss rate (1–100 percent). 	extensive

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CESoPSN Configuration	<p>Information about the CESoPSN configuration.</p> <ul style="list-style-type: none"> • packetization-latency—Time required to create packets (from 1000 through 8000 microseconds). • idle-pattern—An 8-bit hexadecimal pattern to replace TDM data in a lost packet (from 0 through 255). • jitter-buffer-packets—Number of packets in the jitter buffer (from 1 through 64 packets). • jitter-buffer-latency—Time delay in the jitter buffer (from 1 through 1000 milliseconds). • excessive-packet-loss-rate—Set packet loss options. The options are sample-period and threshold. • sample-period—Time required to calculate excessive packet loss rate (from 1000 through 65,535 milliseconds). • threshold—Percentile designating the threshold of excessive packet loss rate (1–100 percent). 	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. • 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

Table 25: T1 or E1 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 interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Encapsulation	Encapsulation on the logical interface.	All levels
Input packets	Number of packets received on the logical interface.	None specified
Output packets	Number of packets transmitted on the logical interface.	None specified
Traffic statistics	(Frame Relay) Number and rate of bytes and packets received and transmitted on the logical interface. <ul style="list-style-type: none"> • Input bytes—Number of bytes received on the interface. • Output bytes—Number of bytes transmitted on the interface. • Input packets—Number of packets received on the interface. • Output packets—Number of packets transmitted on the interface. 	detail extensive
Local statistics	(Frame Relay) Statistics for traffic received from and transmitted to the Routing Engine. When a burst of traffic is received, the value in the output packet rate field might briefly exceed the peak cell rate. It takes a while (generally, less than 1 second) for this counter to stabilize.	detail extensive

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
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
Flags	Information about the protocol family flags. Possible values are described in the “Family Flags” section under <i>Common Output Fields Description</i> .	detail extensive none
Addresses, Flags	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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 can be one or more of the following:</p> <ul style="list-style-type: none"> • Active—Set when the link is active and the DTE and DCE are exchanging information. • Down—Set when the link is active, but no information is received from the DCE. • DCE-Unconfigured—Set when the corresponding DLCI in the DCE is not configured. • Configured—Set when the corresponding DLCI in the DCE is configured. • DCE-configured—Displayed when the command is issued from the DTE. 	detail extensive none
DLCI statistics	<p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> • Active DLCI—Number of active DLCIs. • Inactive DLCI—Number of inactive DLCIs. 	detail extensive none

Table 25: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
CE Info	<p>Information related to the circuit emulation statistics.</p> <ul style="list-style-type: none"> • CE Tx—Number of transmitted packets and bytes (TDM to PSN flow). • CE Rx—Number of received packets and bytes and forward bytes (PSN to TDM flow). • CE Rx Forwarded—Number of forwarded bytes. • CE Strayed—Number of stray packets. • CE Lost—Number of lost packets. • CE Malformed—Number of malformed packets • CE Misinserted—Number of misinserted packets. • CE AIS dropped—Number of dropped bytes due to buffer overrun (PSN to TDM). • CE Dropped—Number of dropped packets during resynchronization • CE Overrun Events—Number of overrun events. • CE Underrun Events—Number of underrun events. 	extensive

Sample Output

show interfaces (T1, IMA Link)

```

user@host> show interfaces t1-1/0/0
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           0  OK
LODS                  0           0  OK
Err-ICP               0           0  OK
IV                    0           0  OK
Rx-FC                  0           0  OK
Tx-FC                  0           0  OK
FE-Defects            0           0
FE-Rx-FC              0           0
FE-Tx-FC              0           0
Rx-ICP                0           0
Rx-Stuff              0           0
Tx-ICP                0          11
Tx-Stuff              0           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 (T1, PPP)

```

user@host> show interfaces t1-1/1/0
Physical interface: t1-1/1/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 0 (never), Output: 0 (never)
  LCP state: Opened
  NCP state: Opened
  CHAP state: Opened
  CoS queues    : 4 supported, 4 in use
  Last flapped  : 2005-12-05 08:43:06 PST (02:13:35 ago)
  Input rate    : 0 bps (0 pps)
  Output rate   : 72 bps (0 pps)
  DS1 alarms   : None
  DS1 defects   : None

Logical interface t1-1/1/0.0 (Index 66) (SNMP ifIndex 51)
  Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 1500
  Flags: Protocol-Down
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
  Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255

```

show interfaces detail (T1, PPP)

```

user@host> show interfaces t1-1/1/0 detail
Physical interface: t1-1/1/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45, Generation: 32
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Hold-times     : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 0 (last seen: never)
    Output: 0 (last sent: never)
  LCP state: Opened
  NCP state: Opened
  CHAP state: Opened
  CoS queues    : 4 supported, 4 in use
  Last flapped  : 2005-12-05 08:43:06 PST (02:13:52 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 0 0 bps
    Output bytes : 798 0 bps
    Input packets: 0 0 pps
    Output packets: 42 0 pps
  Queue counters:
    Queued packets  Transmitted packets  Dropped packets

    0 best-effort    0 0 0
    1 expedited-fo  0 0 0

```

```

2 assured-forw          0          0          0
3 network-cont          40         40          0

DS1  alarms   : None
DS1  defects  : None
DS1  BERT configuration:
      BERT time period: 10 seconds, Elapsed: 0 seconds
      Induced Error rate: 10e-0, Algorithm: 2^15 - 1
Logical interface t1-1/1/0.0 (Index 66) (SNMP ifIndex 51) (Generation 5)
Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 14, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
Generation: 18

```

show interfaces extensive (T1 CRC Errors)

```

user@host> show interfaces t1-3/2/0:1:1 extensive
Physical interface: t1-3/2/0:1:1, Enabled, Physical link is Down
Interface index: 179, SNMP ifIndex: 79, Generation: 180
:
:
DS1  alarms   : AIS, LOF, CRC Major, CRC Minor
DS1  defects  : AIS, LOF, CRC Major, CRC Minor
T1  media:      Seconds      Count  State
SEF              1           1  OK
BEE              1           1  OK
AIS             1128           1  Defect Active
LOF             1128           1  Defect Active
LOS              0            0  OK
YELLOW           0            0  OK
CRC Major        154           1  Defect Active
CRC Minor        154           1  Defect Active
BPV              0            0
EXZ              0            0
LCV              0            0
PCV              0            0
CS               0            0
CRC             154          15400
...

```

show interfaces extensive (T1, PPP)

```

user@host> show interfaces t1-1/1/0 extensive
Physical interface: t1-1/1/0, Enabled, Physical link is Up
Interface index: 149, SNMP ifIndex: 45, Generation: 32
Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
Loopback: None, FCS: 16, Framing: ESF
Device flags   : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags     : Keepalives
Hold-times     : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 0 (last seen: never)
  Output: 0 (last sent: never)
LCP state: Down
NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured

```

```

CHAP state: Closed
CoS queues      : 4 supported, 4 in use
Last flapped    : 2005-12-05 08:43:06 PST (02:13:54 ago)
Statistics last cleared: Never
Traffic statistics:
  Input bytes   :          0          0 bps
  Output bytes  :         817         72 bps
  Input packets :          0          0 pps
  Output packets:         43          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 0,
  L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
  HS link CRC errors: 0, SRAM errors: 0, Resource errors: 0
Output errors:
  Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

  Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort      0              0              0
  1 expedited-fo     0              0              0
  2 assured-forw     0              0              0
  3 network-cont     42             42             0

DS1  alarms   : None
DS1  defects  : None
T1  media:
      Seconds      Count  State
SEF          1         1  OK
BEE          0         0  OK
AIS          0         0  OK
LOF          1         1  OK
LOS          0         0  OK
YELLOW       1         1  OK
BPV          1         1
EXZ          1         1
LCV          1       65535
PCV          1       1023
CS           0         0
LES          1
ES           1
SES          1
SEFS         1
BES          0
UAS          0

HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 1514, Runt threshold: 3
  Timeslots      : All active
  Line encoding: B8ZS
  Buildout       : 0 to 132 feet
  Byte encoding: Nx64K, Data inversion: Disabled, Idle cycle flag: flags,
  Start end flag: shared
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: 2^15 - 1
Packet Forwarding Engine configuration:
  Destination slot: 1, PLP byte: 1 (0x00)

```

```

CoS 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 t1-1/1/0.0 (Index 66) (SNMP ifIndex 51) (Generation 5)
Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
Protocol inet, MTU: 1500, Generation: 14, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
Generation: 18

```

show interfaces (E1, Frame Relay)

```

user@host> show interfaces e1-3/0/0
Physical interface: e1-3/0/0, Enabled, Physical link is Up
  Interface index: 146, SNMP ifIndex: 37
  Link-level type: Frame-Relay, MTU: 1504, Clocking: Internal, Speed: E1,
  Loopback: None, FCS: 16, Framing: G704
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives DTE
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI: Input: 0 (never), Output: 11 (00:00:05 ago)
  DTE statistics:
    Enquiries sent           : 10
    Full enquiries sent      : 1
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received  : 0
    Enquiry responses sent   : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timeout : 1
  CoS queues   : 8 supported
  Last flapped : 2005-11-30 14:50:34 PST (4d 20:33 ago)
  Input rate   : 0 bps (0 pps)
  Output rate  : 0 bps (0 pps)
  DS1 alarms   : None
  DS1 defects  : None
  Logical interface e1-3/0/0.0 (Index 72) (SNMP ifIndex 32)
    Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
  Input packets : 0
  Output packets: 0
    Protocol inet, MTU: 1500
    Flags: None
    Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
      Destination: 10.1.3/24, Local: 10.1.3.1, Broadcast: 10.1.3.255
  DLCI 100
    Flags: Down, DCE-Unconfigured
    Total down time: 00:01:13 sec, Last down: 00:01:13 ago
    Input packets : 0
    Output packets: 0

```

```
DLCI statistics:
  Active DLCI :0 Inactive DLCI :1
```

show interfaces detail (E1, Frame Relay)

```
user@host> show interfaces e1-3/0/0 detail
Physical interface: e1-3/0/0, Enabled, Physical link is Up
  Interface index: 146, SNMP ifIndex: 37, Generation: 69
  Link-level type: Frame-Relay, MTU: 1504, Clocking: Internal, Speed: E1,
  Loopback: None, FCS: 16, Framing: G704
  Device flags : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps 16384
  Link flags : Keepalives DTE
  Hold-times : Up 0 ms, Down 0 ms
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI statistics:
    Input : 0 (last seen: never)
    Output: 12 (last sent 00:00:02 ago)
  DTE statistics:
    Enquiries sent : 10
    Full enquiries sent : 2
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received : 0
    Full enquiries received : 0
    Enquiry responses sent : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 1
  CoS queues : 8 supported
  Last flapped : 2005-11-30 14:50:34 PST (4d 20:33 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 0 0 bps
    Output bytes : 225 56 bps
    Input packets: 0 0 pps
    Output packets: 15 0 pps
  Queue counters:
    Queued packets Transmitted packets Dropped packets

    0 limited 0 0 0
    1 expedited-fo 0 0 0
    2 real-plus 0 0 0
    3 network-cont 15 15 0

  DS1 alarms : None
  DS1 defects : None
  DS1 BERT configuration:
    BERT time period: 10 seconds, Elapsed: 0 seconds
    Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
  Logical interface e1-3/0/0.0 (Index 72) (SNMP ifIndex 32) (Generation 26)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
  Traffic statistics:
    Input bytes : 0
    Output bytes : 0
```

```

    Input packets:          0
    Output packets:         0
Local statistics:
    Input bytes :          0
    Output bytes :         0
    Input packets:         0
    Output packets:        0
Transit statistics:
    Input bytes :          0          0 bps
    Output bytes :         0          0 bps
    Input packets:         0          0 pps
    Output packets:        0          0 pps
Protocol inet, MTU: 1500, Generation: 32, Route table: 0
  Flags: None
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 10.1.3/24, Local: 10.1.3.1, Broadcast: 10.1.3.255,
    Generation: 42
DLCI 100
  Flags: Down, DCE-Unconfigured
  Total down time: 00:01:18 sec, Last down: 00:01:18 ago
  Traffic statistics:
    Input bytes :          0
    Output bytes :         0
    Input packets:         0
    Output packets:        0
DLCI statistics:
  Active DLCI :0 Inactive DLCI :1

```

show interfaces extensive (E1, Frame Relay)

```

user@host> show interfaces e1-3/0/0 extensive
Physical interface: e1-3/0/0, Enabled, Physical link is Up
  Interface index: 146, SNMP ifIndex: 37, Generation: 69
  Link-level type: Frame-Relay, MTU: 1504, Clocking: Internal, Speed: E1,
  Loopback: None, FCS: 16, Framing: G704
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives DTE
  Hold-times     : Up 0 ms, Down 0 ms
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI statistics:
    Input : 0 (last seen: never)
    Output: 12 (last sent 00:00:05 ago)
  DTE statistics:
    Enquiries sent           : 10
    Full enquiries sent      : 2
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received   : 0
    Enquiry responses sent    : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 1
  CoS queues : 8 supported
  Last flapped : 2005-11-30 14:50:34 PST (4d 20:33 ago)
  Statistics last cleared: Never

```



```

Traffic statistics:
Input bytes :          0          0 bps
Output bytes :        225          0 bps
Input packets:         0          0 pps
Output packets:       15          0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 0,
L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
HS link CRC errors: 0, SRAM errors: 0, Resource errors: 0
Output errors:
Carrier transitions: 17, Errors: 0, Drops: 0, Aged packets: 0,
MTU errors: 0, Resource errors: 0
Queue counters:      Queued packets  Transmitted packets      Dropped packets

0 limited            0              0              0

1 expedited-fo       0              0              0

2 real-plus          0              0              0

3 network-cont       15             15             0

DS1  alarms   : None
DS1  defects  : None
E1  media:    Seconds      Count  State
SEF           0           0  OK
BEE           5           5  OK
AIS           0           0  OK
LOF          245          15  OK
LOS          245           4  OK
YELLOW        0          11  OK
BPV           0           0
EXZ           9           9
LCV           0           0
PCV           0           0
CS            0           0
FEBE          0           0
LES           0
ES            0
SES           0
SEFS          0
BES           0
UAS          271

HDLC configuration:
Policing bucket: Disabled
Shaping bucket : Disabled
Giant threshold: 1506, Runt threshold: 0
Timeslots      : All active
Line encoding: HDB3, Data inversion: Disabled, Idle cycle flag: flags,
Start end flag: shared
DS1 BERT configuration:
BERT time period: 10 seconds, Elapsed: 0 seconds
Induced Error rate: 10e-0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
Destination slot: 3, PLP byte: 1 (0x00)
CoS 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, IMA Link)

```

user@host> show interfaces e1-1/0/0
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          0
LODS                  0          0
Err-ICP              0          0
IV                   0          0
Rx-FC                 0          0
Tx-FC                 0          0
FE-Defects           0          0
FE-Rx-FC             0          0
FE-Tx-FC             0          0
Rx-ICP               0          0
Rx-Stuff             0          0
Tx-ICP              11          0
Tx-Stuff             0          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 extensive (T1, TDM-CCC-SATOP)

```
user@host>show interfaces t1-1/0/0:1:1 extensive
Physical interface: t1-1/0/0:1:1, Enabled, Physical link is Down
  Interface index: 153, SNMP ifIndex: 579, Generation: 817
  Link-level type: TDM-CCC-SATOP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF,
  Parent: coc1-1/0/0:1 Interface index 152
  Device flags   : Present Running Down
  Interface flags: Hardware-Down Point-To-Point SNMP-Traps Internal: 0x0
  Link flags     : None
  Hold-times    : Up 0 ms, Down 0 ms
  CoS queues    : 8 supported, 8 maximum usable queues
  Last flapped  : 2012-10-28 02:12:40 PDT (22:32:13 ago)
  Statistics last cleared: 2012-10-29 00:44:52 PDT (00:00:01 ago)
  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

  Queue number:      Mapped forwarding classes
    0                best-effort
    1                expedited-forwarding
    2                assured-forwarding
    3                network-control
  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
    CRC Major        0           0  OK
    CRC Minor        0           0  OK
    BPV              0           0
    EXZ              0           0
    LCV              0           0
    PCV              0           0
    CS               0           0
    CRC              0           0
    LES              0
    ES               0
    SES              0
    SEFS             0
    BES              0
    UAS              0

  SAToP configuration:
    Payload size: 192
    Idle pattern: 0xFF
    Octet aligned: Disabled
```

```

    Jitter buffer: packets: 8, latency: 7 ms, auto adjust: Disabled
    Excessive packet loss rate: sample period: 10000 ms, threshold: 30%
DS1 BERT configuration:
    BERT time period: 10 seconds, Elapsed: 0 seconds
    Induced Error rate: 0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
SONET alarms : None
SONET defects : AIS-V, RDI-V
SONET vt:
    BIP-BIP2          0          0
    REI-V             0          0
    LOP-V             0          0 OK
    AIS-V             2          0 Defect Active
    RDI-V             2          0 Defect Active
    UNEQ-V            0          0 OK
    PLM-V             0          0 OK
    ES-V              0
    SES-V             0
    UAS-V             2
    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: 1
CoS information:
    Direction : Output
    CoS transmit queue
Limit      Bandwidth      Buffer Priority
           %      bps      %      usec      low
    0 best-effort      95      1459200      95      0
none
    3 network-control  5      76800      5      0
none

Logical interface t1-1/0/0:1:1.0 (Index 69) (SNMP ifIndex 580) (Generation 525)

    Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: TDM-CCC-SATOP
CE info      Packets      Bytes Count
CE Tx        1005      192960
CE Rx        1004      192768
CE Rx Forwarded      0
CE Strayed      0
CE Lost      0
CE Malformed      0
CE Misinserted      0
CE AIS dropped      0
CE Dropped      1005      192960
CE Overrun Events      0
CE Underrun Events      0
Protocol ccc, MTU: 1504, Generation: 814, Route table: 0
    Flags: Is-Primary

```

show interfaces extensive (DS, TDM-CCC-CESoPSN)

```

user@host>show interfaces ds-1/0/0:1:1 extensive
Physical interface: ds-1/0/0:1:1:1, Enabled, Physical link is Down
Interface index: 154, SNMP ifIndex: 597, Generation: 819

```

```

Link-level type: TDM-CCC-CESoPSN, MTU: 1504, Speed: 1536kbps, Loopback: None,
FCS: 16, Parent: ct1-1/0/0:1:1 Interface index 153
Device flags   : Present Running Down
Interface flags: Hardware-Down Point-To-Point SNMP-Traps Internal: 0x0
Link flags     : None
Hold-times     : Up 0 ms, Down 0 ms
CoS queues     : 8 supported, 8 maximum usable queues
Last flapped   : 2012-10-29 00:49:03 PDT (00:00:35 ago)
Statistics last cleared: Never
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

Queue number:      Mapped forwarding classes
0                  best-effort
1                  expedited-forwarding
2                  assured-forwarding
3                  network-control

CESoPSN configuration:
  Packetization latency: 1000 us
  Idle pattern: 0xFF
  Jitter buffer: packets: 8, latency: 8 ms, auto adjust: Disabled
  Excessive packet loss rate: sample period: 10000 ms, threshold: 30%
DSO BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 0, Algorithm: 2^15 - 1, 0.151, Pseudorandom (9)
Packet Forwarding Engine configuration:
  Destination slot: 1
CoS information:
  Direction : Output
  CoS transmit queue      Bandwidth      Buffer Priority
Limit
    0 best-effort          95      1459200    95      0      low
none
    3 network-control      5       76800     5       0      low
none

Logical interface ds-1/0/0:1:1:1.0 (Index 69) (SNMP ifIndex 598) (Generation
549)
Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: TDM-CCC-CESoPSN
CE info      Packets      Bytes      Count
CE Tx        0            0
CE Rx        35712        6856704
CE Rx Forwarded      0
CE Strayed          0
CE Lost             0
CE Malformed        0
CE Misinserted      0
CE AIS dropped       0
CE Dropped           0      0
CE Overrun Events          0
CE Underrun Events        1

```

Protocol ccc, MTU: 1504, Generation: 857, Route table: 0
Flags: Is-Primary

show interfaces (T3 or E3)

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 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 512</p> <p>show interfaces detail (T3, PPP) on page 513</p> <p>show interfaces extensive (T3, PPP) on page 514</p> <p>show interfaces (E3, Frame Relay) on page 515</p> <p>show interfaces detail (E3, Frame Relay) on page 516</p> <p>show interfaces extensive (E3, Frame Relay) on page 517</p>
Output Fields	Table 26 on page 503 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 26: 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 <i>Common Output Fields Description</i> .	All levels
Interface index	Physical interface's index number, which reflects its initialization sequence.	detail extensive none

Table 26: 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
Link flags	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	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 26: 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 26: 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 26: 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 26: 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 26: 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 26: 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 26: 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 <i>Common Output Fields Description</i> .	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 <i>Common Output Fields Description</i> .	detail extensive none

Table 26: 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 <i>Common Output Fields Description</i> .	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

Sample Output

show interfaces (T3, PPP)

```

user@host> show interfaces t3-0/2/0
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,
  mpls: Not-configured
  CHAP state: Closed
  CoS queues : 4 supported, 4 in use
  Last flapped : 2005-12-05 08:43:06 PST (02:18:45 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 0 0 bps
    Output bytes : 152 0 bps
    Input packets: 0 0 pps
    Output packets: 8 0 pps
  Queue counters:

```

	Queued packets	Transmitted packets	Dropped packets
0 best-effort	0	0	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	6	6	0

```

Active alarms : None
Active defects : None
DS3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^15 - 1, 0.151, Pseudorandom (9), Induced error rate: 10e-0

Logical interface t3-0/2/0.0 (Index 66) (SNMP ifIndex 54) (Generation 8)
  Flags: Hardware-Down Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 4470, Generation: 17, Route table: 0
  Flags: Protocol-Down

```

Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
 Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
 Generation: 24

show interfaces extensive (T3, PPP)

```

user@host> show interfaces t3-0/2/0 extensive
Physical interface: t3-0/2/0, Enabled, Physical link is Up
  Interface index: 139, SNMP ifIndex: 35, Generation: 22
  Link-level type: PPP, MTU: 4474, Clocking: Internal, Speed: T3,
  Loopback: None, FCS: 16, Mode: C/Bit parity,
  Long buildout: Shorter than 255 feet
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Hold-times    : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 0 (last seen: never)
    Output: 0 (last sent: never)
  LCP state: Down
  NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Closed
  CoS queues   : 4 supported, 4 in use
  Last flapped : 2005-12-05 08:43:06 PST (02:18:47 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :          0          0 bps
    Output bytes :        171         72 bps
    Input packets:          0          0 pps
    Output packets:         9          0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Bucket drops: 0, Policed discards: 0, L3 incompletes: 0,
    L2 channel errors: 0, L2 mismatch timeouts: 0, HS link CRC errors: 0,
    SRAM errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0, MTU errors: 0,

    Resource errors: 0
  Queue counters:      Queued packets  Transmitted packets      Dropped packets

    0 best-effort              0              0              0

    1 expedited-fo              0              0              0

    2 assured-forw              0              0              0

    3 network-cont              7              7              0

  Active alarms : None
  Active defects : None
  DS3 media:
    Seconds      Count  State
    PLL Lock      0      0 OK
    Reframing      0      0 OK
    AIS            0      0 OK
    LOF            0      0 OK
    LOS            0      0 OK
    IDLE           0      0 OK
    YELLOW         0      0 OK

```

```

BPV                0          0
EXZ                0          0
LCV                1          4
PCV                0          0
CCV                0          0
FEBE               1          11
LES                1
PES                0
PSES               0
CES                0
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 (E3, Frame Relay)

```

user@host> show interfaces e3-1/2/0
Physical interface: e3-1/2/0, Enabled, Physical link is Up
Interface index: 153, SNMP ifIndex: 49
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, Speed: E3,
Loopback: None, FCS: 16, Framing: G751
Device flags      : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
Link flags       : Keepalives DTE
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI: Input: 0 (never), Output: 4 (00:00:06 ago)
DTE statistics:
  Enquiries sent                : 4
  Full enquiries sent           : 0
  Enquiry responses received    : 0
  Full enquiry responses received : 0
DCE statistics:
  Enquiries received            : 0
  Full enquiries received       : 0
  Enquiry responses sent        : 0

```

```

    Full enquiry responses sent      : 0
Common statistics:
    Unknown messages received       : 0
    Asynchronous updates received   : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout     : 1
CoS queues      : 4 supported, 4 in use
Last flapped   : 2005-12-05 08:46:14 PST (02:27:17 ago)
Input rate     : 0 bps (0 pps)
Output rate    : 0 bps (0 pps)
Active alarms  : None
Active defects : None

Logical interface e3-1/2/0.0 (Index 66) (SNMP ifIndex 57)
  Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
Input packets : 0
Output packets: 0
  Protocol inet, MTU: 4470
  Flags: None
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255
  DLCI 100
    Flags: Down, DCE-Unconfigured
    Total down time: 00:00:06 sec, Last down: 00:00:06 ago
    Input packets : 0
    Output packets: 0
  DLCI statistics:
    Active DLCI :0 Inactive DLCI :1

```

show interfaces detail (E3, Frame Relay)

```

user@host> show interfaces e3-1/2/0 detail
Physical interface: e3-1/2/0, Enabled, Physical link is Up
  Interface index: 153, SNMP ifIndex: 49, Generation: 36
  Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, Speed: E3,
  Loopback: None, FCS: 16, Framing: G751
  Device flags   : Present Running
  Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives DTE
  Hold-times     : Up 0 ms, Down 0 ms
  ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
  LMI statistics:
    Input : 0 (last seen: never)
    Output: 5 (last sent 00:00:07 ago)
  DTE statistics:
    Enquiries sent           : 5
    Full enquiries sent      : 0
    Enquiry responses received : 0
    Full enquiry responses received : 0
  DCE statistics:
    Enquiries received       : 0
    Full enquiries received   : 0
    Enquiry responses sent    : 0
    Full enquiry responses sent : 0
  Common statistics:
    Unknown messages received : 0
    Asynchronous updates received : 0
    Out-of-sequence packets received : 0
    Keepalive responses timedout : 1
  CoS queues      : 4 supported, 4 in use
  Last flapped   : 2005-12-05 08:46:14 PST (02:27:27 ago)

```

```

Statistics last cleared: Never
Traffic statistics:
Input bytes :          0          0 bps
Output bytes :        806          0 bps
Input packets:         0          0 pps
Output packets:       44          0 pps
Queue counters:      Queued packets  Transmitted packets  Dropped packets

0 best-effort          0          0          0
1 expedited-fo         0          0          0
2 assured-forw         0          0          0
3 network-cont        43         43          0

Active alarms : None
Active defects : None

Logical interface e3-1/2/0.0 (Index 66) (SNMP ifIndex 57) (Generation 15)
Flags: Device-Down Point-To-Point SNMP-Traps Encapsulation: FR-NLPID
Traffic statistics:
Input bytes :          0
Output bytes :          0
Input packets:         0
Output packets:         0
Local statistics:
Input bytes :          0
Output bytes :          0
Input packets:         0
Output packets:         0
Transit statistics:
Input bytes :          0          0 bps
Output bytes :          0          0 bps
Input packets:         0          0 pps
Output packets:         0          0 pps
Protocol inet, MTU: 4470, Generation: 24, Route table: 0
Flags: None
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
Generation: 38
DLCI 100
Flags: Down, DCE-Unconfigured
Total down time: 00:00:16 sec, Last down: 00:00:16 ago
Traffic statistics:
Input bytes :          0
Output bytes :          0
Input packets:         0
Output packets:         0
DLCI statistics:
Active DLCI :0 Inactive DLCI :1

```

show interfaces extensive (E3, Frame Relay)

```

user@host> show interfaces e3-1/2/0 extensive
Physical interface: e3-1/2/0, Enabled, Physical link is Up
Interface index: 153, SNMP ifIndex: 49, Generation: 36
Link-level type: Frame-Relay, MTU: 4474, Clocking: Internal, Speed: E3,
Loopback: None, FCS: 16, Framing: G751
Device flags : Present Running
Interface flags: Link-Layer-Down Point-To-Point SNMP-Traps Internal: 0x4000

```

```

Link flags      : Keepalives DTE
Hold-times     : Up 0 ms, Down 0 ms
ANSI LMI settings: n391dte 6, n392dte 3, n393dte 4, t391dte 10 seconds
LMI statistics:
  Input : 0 (last seen: never)
  Output: 6 (last sent 00:00:02 ago)
DTE statistics:
  Enquiries sent           : 5
  Full enquiries sent      : 1
  Enquiry responses received : 0
  Full enquiry responses received : 0
DCE statistics:
  Enquiries received       : 0
  Full enquiries received  : 0
  Enquiry responses sent   : 0
  Full enquiry responses sent : 0
Common statistics:
  Unknown messages received : 0
  Asynchronous updates received : 0
  Out-of-sequence packets received : 0
  Keepalive responses 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

```


CHAPTER 6

Command Summary

PART 4

Troubleshooting

- [Interface Diagnostics on page 525](#)

CHAPTER 7

Interface Diagnostics

- [Interface Diagnostics on page 525](#)

Interface Diagnostics

You can use two diagnostic tools to test the physical layer connections of interfaces: loopback testing and bit error rate test (BERT) testing. Loopback testing enables you to verify the connectivity of a circuit. BERT testing enables you to identify poor signal quality on a circuit. This section contains the following topics:

- [Configuring Loopback Testing on page 525](#)
- [Interface Diagnostics on page 527](#)

Configuring Loopback Testing

Loopback testing allows you to verify the connectivity of a circuit. You can configure any of the following interfaces to execute a loopback test: Aggregated Ethernet, Fast Ethernet, Gigabit Ethernet, E1, E3, NxDS0, serial, SONET/SDH, T1, and T3.

The physical path of a network data circuit usually consists of segments interconnected by devices that repeat and regenerate the transmission signal. The transmit path on one device connects to the receive path on the next device. If a circuit fault occurs in the form of a line break or a signal corruption, you can isolate the problem by using a loopback test. Loopback tests allow you to isolate segments of the circuit and test them separately.

To do this, configure a *line loopback* on one of the routers. Instead of transmitting the signal toward the far-end device, the line loopback sends the signal back to the originating router. If the originating router receives back its own data link layer packets, you have verified that the problem is beyond the originating router. Next, configure a line loopback farther away from the local router. If this originating router does not receive its own data link layer packets, you can assume the problem is on one of the segments between the local router and the remote router's interface card. In this case, the next troubleshooting step is to configure a line loopback closer to the local router to find the source of the problem.

There are several types of loopback testing supported by the Junos OS, as follows:

- DCE local—Loops packets back on the local DCE.
- DCE remote—Loops packets back on the remote DCE.

- **Local**—Useful for troubleshooting physical PIC errors. Configuring local loopback on an interface allows transmission of packets to the channel service unit (CSU) and then to the circuit toward the far-end device. The interface receives its own transmission, which includes data and timing information, on the local router's PIC. The data received from the CSU is ignored. To test a local loopback, issue the **show interfaces *interface-name*** command. If PPP keepalives transmitted on the interface are received by the PIC, the **Device Flags** field contains the output **Loop-Detected**.
- **Payload**—Useful for troubleshooting the physical circuit problems between the local router and the remote router. A payload loopback loops data only (without clocking information) on the remote router's PIC. With payload loopback, overhead is recalculated.
- **Remote**—Useful for troubleshooting the physical circuit problems between the local router and the remote router. A remote loopback loops packets, including both data and timing information, back on the remote router's interface card. A router at one end of the circuit initiates a remote loopback toward its remote partner. When you configure a remote loopback, the packets received from the physical circuit and CSU are received by the interface. Those packets are then retransmitted by the PIC back toward the CSU and the circuit. This loopback tests all the intermediate transmission segments.

Table 27 on page 526 shows the loopback modes supported on the various interface types.

Table 27: Loopback Modes by Interface Type

Interface	Loopback Modes	Usage Guidelines
Aggregated Ethernet, Fast Ethernet, Gigabit Ethernet	Local	<i>Configuring Ethernet Loopback Capability</i>
Circuit Emulation E1	Local and remote	<i>Configuring E1 Loopback Capability</i>
Circuit Emulation T1	Local and remote	<i>Configuring T1 Loopback Capability</i>
E1 and E3	Local and remote	<i>Configuring E1 Loopback Capability and Configuring E3 Loopback Capability</i>
NxDSO	Payload	<i>Configuring Channelized E1 IQ and IQE Interfaces, Configuring T1 and NxDSO Interfaces, Configuring Channelized OC12/STM4 IQ and IQE Interfaces (SONET Mode), Configuring Channelized STM1 IQ and IQE Interfaces, and Configuring Channelized T3 IQ Interfaces</i>
Serial (V.35 and X.21)	Local and remote	<i>Configuring Serial Loopback Capability</i>
Serial (EIA-530)	DCE local, DCE remote, local, and remote	<i>Configuring Serial Loopback Capability</i>
SONET/SDH	Local and remote	<i>Configuring SONET/SDH Loopback Capability</i>

Table 27: Loopback Modes by Interface Type (*continued*)

Interface	Loopback Modes	Usage Guidelines
T1 and T3	Local, payload, and remote	<i>Configuring T1 Loopback Capability</i> and <i>Configuring T3 Loopback Capability</i> <i>See also Configuring the T1 Remote Loopback Response</i>

To configure loopback testing, include the **loopback** statement:

loopback mode;

You can include this statement at the following hierarchy levels:

- [edit interfaces *interface-name* aggregated-ether-options]
- [edit interfaces *interface-name* ds0-options]
- [edit interfaces *interface-name* e1-options]
- [edit interfaces *interface-name* e3-options]
- [edit interfaces *interface-name* fastether-options]
- [edit interfaces *interface-name* gige-ether-options]
- [edit interfaces *interface-name* serial-options]
- [edit interfaces *interface-name* sonet-options]
- [edit interfaces *interface-name* t1-options]
- [edit interfaces *interface-name* t3-options]

Interface Diagnostics

BERT allows you to troubleshoot problems by checking the quality of links. You can configure any of the following interfaces to execute a BERT when the interface receives a request to run this test: E1, E3, T1, T3; the channelized DS3, OC3, OC12, and STM1 interfaces; and the channelized DS3 IQ, E1 IQ, and OC12 IQ interfaces.

A BERT test requires a line loop to be in place on either the transmission devices or the far-end router. The local router generates a known bit pattern and sends it out the transmit path. The received pattern is then verified against the sent pattern. The higher the bit error rate of the received pattern, the worse the noise is on the physical circuit. As you move the position of the line loop increasingly downstream toward the far-end router, you can isolate the troubled portion of the link.

To configure BERT, you must configure the duration of the test, the bit pattern to send on the transmit path, and the error rate to monitor when the inbound pattern is received.

To configure the duration of the test, the pattern to send in the bit stream, and the error rate to include in the bit stream, include the **bert-period**, **bert-algorithm**, and **bert-error-rate** statements, respectively, at the [edit interfaces *interface-name* *interface-type*-options] hierarchy level:

```
[edit interfaces interface-name interface-type-options]
bert-algorithm algorithm;
bert-error-rate rate;
bert-period seconds;
```

By default, the BERT period is 10 seconds. You can configure the BERT period to last from 1 through 239 seconds on some PICs and from 1 through 240 seconds on other PICs.

rate is the bit error rate. This can be an integer from 0 through 7, which corresponds to a bit error rate from 10^{-0} (1 error per bit) to 10^{-7} (1 error per 10 million bits).

algorithm is the pattern to send in the bit stream. For a list of supported algorithms, enter a ? after the **bert-algorithm** statement; for example:

```
[edit interfaces t1-0/0/0 t1-options]
user@host# set bert-algorithm ?
Possible completions:
pseudo-2e11-o152      Pattern is 2^11 - 1 (per 0.152 standard)
pseudo-2e15-o151      Pattern is 2^15 - 1 (per 0.152 standard)
pseudo-2e20-o151      Pattern is 2^20 - 1 (per 0.151 standard)
pseudo-2e20-o153      Pattern is 2^20 - 1 (per 0.153 standard)
...
```

For specific hierarchy information, see the individual interface types.



NOTE: The 4-port E1 PIC supports only the following algorithms:

pseudo-2e11-o152	Pattern is 2^11 - 1 (per 0.152 standard)
pseudo-2e15-o151	Pattern is 2^15 - 1 (per 0.151 standard)
pseudo-2e20-o151	Pattern is 2^20 - 1 (per 0.151 standard)
pseudo-2e23-o151	Pattern is 2^23 (per 0.151 standard)

When you issue the help command from the CLI, all BERT algorithm options are displayed, regardless of the PIC type, and no commit check is available. Unsupported patterns for a PIC type can be viewed in system log messages.



NOTE: The 12-port T1/E1 Circuit Emulation (CE) PIC supports only the following algorithms:

```
all-ones-repeating    Repeating one bits
all-zeros-repeating   Repeating zero bits
alternating-double-ones-zeros Alternating pairs of ones and zeros
alternating-ones-zeros Alternating ones and zeros
pseudo-2e11-o152      Pattern is 2^11 - 1 (per 0.152 standard)
pseudo-2e15-o151      Pattern is 2^15 - 1 (per 0.151 standard)
pseudo-2e20-o151      Pattern is 2^20 - 1 (per 0.151 standard)
pseudo-2e7            Pattern is 2^7 - 1
pseudo-2e9-o153       Pattern is 2^9 - 1 (per 0.153 standard)
repeating-1-in-4       1 bit in 4 is set
repeating-1-in-8       1 bit in 8 is set
repeating-3-in-24      3 bits in 24 are set
```

When you issue the help command from the CLI, all BERT algorithm options are displayed, regardless of the PIC type, and no commit check is available. Unsupported patterns for a PIC type can be viewed in system log messages.



NOTE: The IQE PICs support only the following algorithms:

```
all-ones-repeating    Repeating one bits
all-zeros-repeating   Repeating zero bits
alternating-double-ones-zeros Alternating pairs of ones and zeros
alternating-ones-zeros Alternating ones and zeros
pseudo-2e9-o153       Pattern is 2^9 - 1 (per 0.153 (511 type) standard)
pseudo-2e11-o152      Pattern is 2^11 - 1 (per 0.152 and 0.153 (2047 type)
standards)
pseudo-2e15-o151      Pattern is 2^15 - 1 (per 0.151 standard)
pseudo-2e20-o151      Pattern is 2^20 - 1 (per 0.151 standard)
pseudo-2e20-o153      Pattern is 2^20 - 1 (per 0.153 standard)
pseudo-2e23-o151      Pattern is 2^23 - 1 (per 0.151 standard)
repeating-1-in-4       1 bit in 4 is set
repeating-1-in-8       1 bit in 8 is set
repeating-3-in-24      3 bits in 24 are set
```

When you issue the help command from the CLI, all BERT algorithm options are displayed, regardless of the PIC type, and no commit check is available. Unsupported patterns for a PIC type can be viewed in system log messages.



NOTE: BERT is supported on the PDH interfaces of the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP and the DS3/E3 MIC. The following BERT algorithms are supported:

all-ones-repeating	Repeating one bits
all-zeros-repeating	Repeating zero bits
alternating-double-ones-zeros	Alternating pairs of ones and zeros
alternating-ones-zeros	Alternating ones and zeros
repeating-1-in-4	1 bit in 4 is set
repeating-1-in-8	1 bit in 8 is set
repeating-3-in-24	3 bits in 24 are set
pseudo-2e9-o153	Pattern is $2^9 - 1$ (per 0.153 standard)
pseudo-2e11-o152	Pattern is $2^{11} - 1$ (per 0.152 standard)
pseudo-2e15-o151	Pattern is $2^{15} - 1$ (per 0.151 standard)
pseudo-2e20-o151	Pattern is $2^{20} - 1$ (per 0.151 standard)
pseudo-2e20-o153	Pattern is $2^{20} - 1$ (per 0.153 standard)
pseudo-2e23-o151	Pattern is $2^{23} - 1$ (per 0.151 standard)

Table 28 on page 530 shows the BERT capabilities for various interface types.

Table 28: BERT Capabilities by Interface Type

Interface	T1 BERT	T3 BERT	Comments
12-port T1/E1 Circuit Emulation	Yes (ports 0–11)		<ul style="list-style-type: none"> Limited algorithms
4-port Channelized OC3/STM1 Circuit Emulation	Yes (port 0–3)		<ul style="list-style-type: none"> Limited algorithms
E1 or T1	Yes (port 0–3)	Yes (port 0–3)	<ul style="list-style-type: none"> Single port at a time Limited algorithms
E3 or T3	Yes (port 0–3)	Yes (port 0–3)	<ul style="list-style-type: none"> Single port at a time
Channelized OC12	N/A	Yes (channel 0–11)	<ul style="list-style-type: none"> Single channel at a time Limited algorithms No bit count
Channelized STM1	Yes (channel 0–62)	N/A	<ul style="list-style-type: none"> Multiple channels Only one algorithm No error insert No bit count
Channelized T3 and Multichannel T3	Yes (channel 0–27)	Yes (port 0–3 on channel 0)	<ul style="list-style-type: none"> Multiple ports and channels Limited algorithms for T1 No error insert for T1 No bit count for T1

These limitations do not apply to channelized IQ interfaces. For information about BERT capabilities on channelized IQ interfaces, see *Channelized IQ and IQE Interfaces Properties*.

Starting and Stopping a BERT Test

Before you can start the BERT test, you must disable the interface. To do this, include the **disable** statement at the **[edit interfaces *interface-name*]** hierarchy level:

```
[edit interfaces interface-name]  
  disable;
```

After you configure the BERT properties and commit the configuration, begin the test by issuing the **test interface *interface-name interface-type-bert-start*** operational mode command:

```
user@host> test interface interface-name interface-type-bert-start
```

The test runs for the duration you specify with the **bert-period** statement. If you wish to terminate the test sooner, issue the **test interface *interface-name interface-type-bert-stop*** command:

```
user@host> test interface interface-name interface-type-bert-stop
```

For example:

```
user@host> test interface t3-1/2/0 t3-bert-start  
user@host> test interface t3-1/2/0 t3-bert-stop
```

To view the results of the BERT test, issue the **show interfaces extensive | find BERT** command:

```
user@host> show interfaces interface-name extensive | find BERT
```

For more information about running and evaluating the results of the BERT procedure, see the *Junos OS Operational Mode Commands*.



NOTE: To exchange BERT patterns between a local router and a remote router, include the **loopback remote** statement in the interface configuration at the remote end of the link. From the local router, issue the **test interface** command.

Example: Configuring Bit Error Rate Testing

Configure a BERT test on a T3 interface. In this example, the run duration lasts for 120 seconds. The configured error rate is 0, which corresponds to a bit error rate of 10^{-0} (1 error per bit). The configured bit pattern of **all-ones-repeating** means that every bit the interface sends is a set to a value of 1.

```
[edit interfaces]  
  t3-1/2/0 {  
    t3-options {  
      bert algorithm all-ones-repeating;  
      bert-error-rate 0;  
      bert-period 120;
```

```
}  
}
```

PART 5

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