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Junos<sup>®</sup> OS

# Channelized OC48/STM16 IQE Interfaces Feature Guide for Routing Devices

Release

14.1



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*Junos<sup>®</sup> OS Channelized OC48/STM16 IQE Interfaces Feature Guide for Routing Devices*

14.1

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# About the Documentation

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## Documentation and Release Notes

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To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

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

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

## Supported Platforms

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

- M320
- M120
- M40e
- MX960
- MX480
- MX240
- T Series

## Using the Examples in This Manual

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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 xiv 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.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

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

Table 2: Text and Syntax Conventions

Convention	Description	Examples
<b>Bold text like this</b>	Represents text that you type.	To enter configuration mode, type the <b>configure</b> command:  user@host> <b>configure</b>
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> <b>show chassis alarms</b>  No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> <li>Introduces or emphasizes important new terms.</li> <li>Identifies guide names.</li> <li>Identifies RFC and Internet draft titles.</li> </ul>	<ul style="list-style-type: none"> <li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li> <li><i>Junos OS CLI User Guide</i></li> <li>RFC 1997, <i>BGP Communities Attribute</i></li> </ul>
<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@# <b>set system domain-name</b> <i>domain-name</i>

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

Convention	Description	Examples
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"><li>To configure a stub area, include the <b>stub</b> statement at the <b>[edit protocols ospf area area-id]</b> hierarchy level.</li><li>The console port is labeled <b>CONSOLE</b>.</li></ul>
< > (angle brackets)	Encloses optional keywords or variables.	<b>stub &lt;default-metric <i>metric</i>&gt;;</b>
(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.	<b>broadcast   multicast</b>  <b>(<i>string1</i>   <i>string2</i>   <i>string3</i>)</b>
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	<b>rsvp { # Required for dynamic MPLS only</b>
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	<b>community name members [ <i>community-ids</i> ]</b>
Indentation and braces ( { } )	Identifies a level in the configuration hierarchy.	<pre>[edit] routing-options {   static {     route default {       nexthop <i>address</i>;       retain;     }   } }</pre>
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"><li>In the Logical Interfaces box, select <b>All Interfaces</b>.</li><li>To cancel the configuration, click <b>Cancel</b>.</li></ul>
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select <b>Protocols&gt;Ospf</b> .

## Documentation Feedback

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- Document or topic name
- URL or page number

- Software release version (if applicable)

## Requesting Technical Support

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- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/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.

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

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

- [Channelized OC48/STM16 IQE Interfaces on page 3](#)



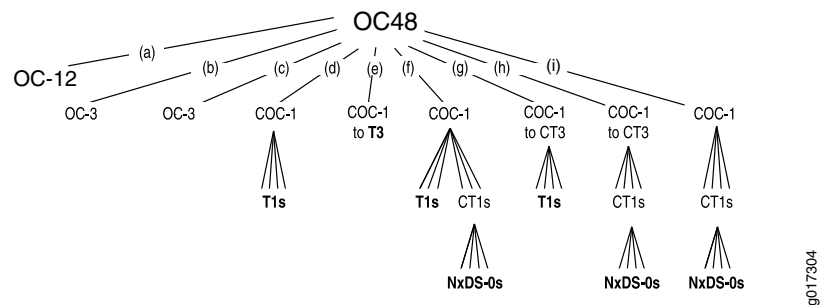
# Channelized OC48/STM16 IQE Interfaces

- Channelized OC48/STM16 IQE Interfaces Overview on page 3

## Channelized OC48/STM16 IQE Interfaces Overview

Channelized enhanced intelligent queuing (IQE) interfaces allow arbitrary and dynamic channelization of serial links, allowing greater flexibility than the channelized interfaces. [Figure 1 on page 3](#), [Figure 2 on page 4](#), and [Figure 3 on page 4](#) illustrate the Channelized OC48/STM16 IQE Physical Interface Cards (PICs) in several examples of many possible configurations.

**Figure 1: Sample Channelization of OC48/STM16 IQE PIC (SONET Mode)**



**Bold entries** correspond to actual packet channels.

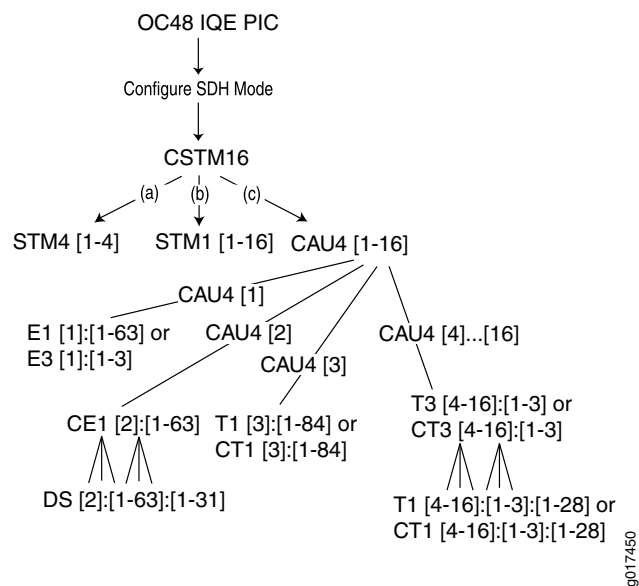
In the example in [Figure 1 on page 3](#), a Channelized OC48/STM16 IQE PIC operating in SONET mode is partitioned into the following OC slices:

- A clear channel OC12 interface.
- An OC3 interface.
- A channelized COC1 partitioned into T1 interfaces.
- A channelized COC1 partitioned into a T3 interface.
- A channelized COC1 partitioned into CT3, partitioned into T1 interfaces, and CT1s partitioned into NxDS0 interfaces.
- A channelized COC1 partitioned into CT3, partitioned into T1 interfaces.

- g. A channelized COC1 partitioned into CT3, partitioned into CTIs, partitioned into NxDSO interfaces.
- h. A channelized COC1 partitioned into CTIs, partitioned into NxDSO interfaces.

This is one of thousands of ways to configure a Channelized OC48/STM16 IQE PIC. To configure the interfaces shown in [Figure 2 on page 4](#), see “[Configuring Channelized OC48/STM16 IQE Interfaces \(SDH Mode\)](#)” on page 16.

**Figure 2: Sample Channelization of OC48/STM16 IQE PIC (SDH Mode)**

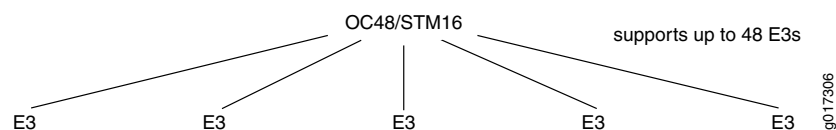


In [Figure 2 on page 4](#), a Channelized OC48/STM16 IQE PIC operating in SDH mode results in a channelized STM16 interface, which can be partitioned as the following:

- a. Up to 4 STM4s.
- b. Up to 16 STM1s.
- c. Up to 16 CAU4s that can each be partitioned into up to 63 EIs, up to 3 E3s, or up to 63 CEIs. Up to 16 CAU4s that can each be partitioned into up to 84 TIs, 84 CTIs, 63 EIs, 63 CEIs, 3 E3s, 3 T3s or 3 CT3s. Each CE1 can be partitioned into up to 31 NxDSOs. Each CT1 can be partitioned into up to 24 NxDSOs. Each CT3 can be partitioned into up to 28 TIs or 28 CTIs.

This is one of thousands of ways to configure a Channelized OC48/STM16 IQE PIC.

**Figure 3: Sample Channelization of OC48/STM16 IQE PIC to E3 Channels**



[Figure 3 on page 4](#) shows five E3 channels configured on the Channelized OC48/STM16 IQE PIC. You can configure 43 additional E3 channels. For more information about configuring E3 channels on Channelized OC48/STM16 IQE PICs, see [“Configuring E3 Interfaces” on page 18](#).

For a full configuration example, see the *Junos OS, Release 14.1*.





## PART 2

# Configuration

- [Channelized OC48/STM16 IQE Interfaces on page 9](#)
- [Network Interfaces Configuration Statements and Hierarchy on page 25](#)
- [Statement Summary on page 49](#)



## CHAPTER 2

# Channelized OC48/STM16 IQE Interfaces

- [Configuring Channelized OC48/STM16 IQE Interfaces in SONET Mode on page 9](#)
- [Configuring Channelized OC48/STM16 IQE Interfaces \(SDH Mode\) on page 16](#)
- [Configuring Link PIC Failover on Channelized OC48/STM16 IQE Interfaces on page 22](#)
- [Example: Configuring Channelized OC48 Interfaces with Partitioned Channels on page 22](#)

## Configuring Channelized OC48/STM16 IQE Interfaces in SONET Mode

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- [Configuring OC12 Interfaces on page 9](#)
- [Configuring OC3 Interfaces on page 10](#)
- [Configuring T3 Interfaces on page 11](#)
- [Configuring T1 Interfaces on page 12](#)
- [Configuring Fractional T1 Interfaces on page 14](#)
- [Configuring NxDS0 Interfaces on page 14](#)

### Configuring OC12 Interfaces

You can configure up to four OC12 interfaces on a 1-port Channelized OC48/STM16 IQE PIC. To configure an OC12 interface, include the **partition**, **oc-slice**, and **interface-type** statements at the **[edit interfaces coc48-fpc/pic/port]** hierarchy level, specifying the **so** interface type:

```
[edit interfaces coc48-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type so;
```

The partition number is the sublevel interface partition index. For SONET/SDH interfaces, the partition number does not correlate with bandwidth size. For OC12 interfaces, the partition number can be from 1 through 4.



**NOTE:** For channelized OC48 IQE interfaces, channel numbering begins with 1 (:1).

The OC-slice range is the range of SONET/SDH slices. For SONET/SDH interfaces, the OC-slice range specifies the bandwidth size required for the interface type you are

configuring. OC12 interfaces must occupy 12 consecutive OC slices per interface, in one of the following forms:

- 1–12
- 13–24
- 25–26
- 37–48

By contrast, the T3 and OC1 interfaces each occupy one OC slice per interface and OC3 interfaces occupy three slices per interface.

The interface type is the channelized interface type or data channel you are creating. For channelized OC48 IQE interfaces, the interface type can be **so**.

#### Example: Configuring OC12 Interfaces

---

Configure an OC12 interface, using partition 1 and OC slices 1 through 12. This configuration creates interface **so-1/1/0:1**.

```
[edit interfaces coc48-1/1/0]
partition 1 oc-slice 1-12 interface-type so;
```

For a full configuration example, see the *Junos OS, Release 14.1*.

## Configuring OC3 Interfaces

To configure an OC3 interface, include the **partition**, **oc-slice**, and **interface-type** statements at the **[edit interfaces coc48-fpc/pic/port]** hierarchy level, specifying the **so** interface type:

```
[edit interfaces coc48-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type so;
```

The partition number is the sublevel interface partition index. For SONET/SDH interfaces, the partition number does not correlate with bandwidth size. For OC3 interfaces, the partition number can be from 1 through 16.



**NOTE:** For channelized OC48 IQE interfaces, channel numbering begins with 1 (:1).

The OC-slice range is the range of SONET/SDH slices. For SONET/SDH interfaces, the OC-slice range specifies the bandwidth size required for the interface type you are configuring. OC3 interfaces must occupy three consecutive OC slices per interface, in one of the following forms:

- 1–3
- 4–6
- 7–9
- 10–12
- and so on (in groups of 3), up to 48

By contrast, the T3 and OC1 interfaces each occupy one OC slice per interface.

The interface type is the channelized interface type or data channel you are creating. For channelized OC48 IQE interfaces, the interface type can be **so**.

### Example: Configuring OC3 Interfaces

Configure an OC3 interface, using partition 1 and OC slices 4 through 6. This configuration creates interface **so-1/1/0:1**.

```
[edit interfaces coc48-1/1/0]
partition 1 oc-slice 4-6 interface-type so;
```

For a full configuration example, see the *Junos OS, Release 14.1*.

## Configuring T3 Interfaces

To configure a T3 interface on an OC48/STM16 IQE PIC, include the **partition**, **oc-slice**, and **interface-type** statements at the **[edit interfaces coc48-fpc/pic/port]** hierarchy level, specifying the **coc1** interface type:

```
[edit interfaces coc48-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type coc1;
```

This configuration creates interface **coc1-fpc/pic/port:channel**.

Then, include the **no-partition interface-type** statement at the **[edit interfaces coc1-fpc/pic/port:channel]** hierarchy level, specifying the **t3** interface type:

```
[edit interfaces coc1-fpc/pic/port:channel]
no-partition interface-type t3;
```

This configuration creates interface **t3-fpc/pic/port:channel**.

The partition number is the sublevel interface partition index and is correlated with the channel number. For channelized OC1 interfaces, the partition number can be from 1 through 48. For channelized OC48/STM16 IQE interfaces, channel numbering begins with 1 (:1).

The OC-slice range is the range of SONET/SDH slices. For SONET/SDH interfaces, the OC-slice range specifies the bandwidth size required for the interface type you are configuring. For channelized OC1 interfaces, the OC slice can be from 1 through 12. You can configure only one OC slice per channelized OC1 interface.

The interface type is the channelized interface type or clear channel you are creating. For channelized OC48 interfaces, **type** can be **so** or **coc1**.



**NOTE:** Channelized OC48/STM16 IQE interfaces in M Series, MX Series, and T Series routers reserve channels 0 through 3 of each OC12 space for STS3c SONET channels.

When you configure E3 or T3 channels in OC12 spaces on the described PICs, the Junos OS allocates them starting from channel 4 because channels 0 through 3 are reserved for four STS3c SONET channels. Channel numbers are allocated sequentially in the following order: 4, 5, 6, 7, 8, 9, 11, 0, 1, 2, 3.

Only after channels 4 through 11 of the OC12 space are exhausted (all 4 through 11 configured) for E3 or T3 channels will the Junos OS then allocate channel 0 through 3 space for further E3 or T3 channels; thereby using up the 0 through 3 space previously reserved for four STS3c SONET channels.

If a subsequent reconfiguration of this OC12 space occurs, where you try to replace channels 4 through 6 or 7 through 9 with an OC3 SONET channel; the configuration fails because the channel 0 through 3 space is already occupied by the last E3 or T3 channels configured. This causes a failure in channel allocation and the Device Control Daemon (DCD) keeps retrying forever to configure the channel allocation on the interface. The only resolution is to reconfigure the last configured E3/T3 channels with OC3 channels, to free channels 0 through 3.

---

### Example: Configuring T3 Interfaces

Configure a T3 interface using partition 3 and OC slice 3. This configuration creates interface **t3-1/1/0:3**:

```
[edit interfaces coc48-1/1/0]
partition 3 oc-slice 3 interface-type coc1;
[edit interfaces coc1-1/1/0:3]
no-partition interface-type t3;
```

For a full configuration example, see the *Junos OS, Release 14.1*.

## Configuring T1 Interfaces

To configure T1 interfaces on a Channelized OC48 IQE PIC, perform the following tasks:

1. Partition the channelized OC48 IQE interface into channelized OC1 interfaces by including the **partition**, **oc-slice**, and **interface-type** statements at the **[edit interfaces coc48-fpc/pic/port]** hierarchy level, specifying the **coc1** interface type:

```
[edit interfaces coc48-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type coc1;
```

2. If your network equipment uses VT mapping, partition the channelized OC1 interface into T1 interfaces by including the **partition** and **interface-type** statements at the **[edit interfaces coc1-fpc/pic/port]** hierarchy level, specifying the **t1** interface type:

```
[edit interfaces coc1-fpc/pic/port:channel]
partition partition-number interface-type t1;
```

3. If your network equipment uses M13 or C-bit parity, convert the channelized OC1 interface into a channelized T3 interface by including the **no-partition** and **interface-type** statements at the `[edit interfaces coc1-fpc/pic/port:channel]` hierarchy level, specifying the **ct3** interface type. Note that because the **no-partition** statement is included, this configuration does not create another level of channelization, as denoted by the number of colons in the resulting interface.

```
[edit interfaces coc1-fpc/pic/port:channel]
no-partition partition-number interface-type ct3;
```

4. Partition the channelized T3 interface into T1 interfaces by including the **partition** and **interface-type** statements at the `[edit interfaces ct3-fpc/pic/port:channel]` hierarchy level, specifying the **t1** interface type:

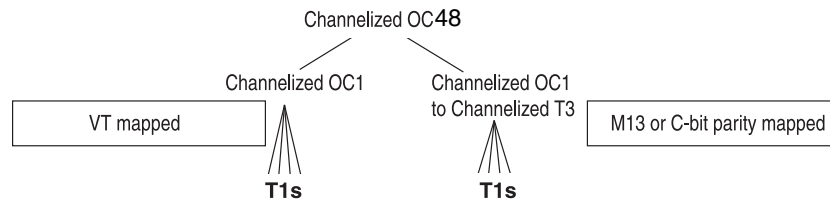
```
[edit interfaces ct3-fpc/pic/port:channel]
partition partition-number interface-type t1;
```



**NOTE:** Class-of-service (CoS) rules cannot be applied to an individual channel configured on channelized IQE interfaces. You can only apply CoS rules to the aggregate bit streams.

Figure 4 on page 13 shows VT-mapped and M13 or C-bit parity-mapped configurations of T1 interfaces.

**Figure 4: T1 Interfaces on a Channelized OC48 PIC**



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**Bold** entries correspond to actual packet channels.

### Example: Configuring T1 Interfaces

Configure the following T1 interfaces:

```
t1-0/0/0:1:1
t1-0/0/0:1:2
t1-0/0/0:1:3
t1-0/0/0:1:4
t1-0/0/0:1:5
```

#### VT-Mapped Configuration

```
[edit interfaces coc48-0/0/0]
partition 1 oc-slice 1 interface-type coc1;
```

```
[edit interfaces coc1-0/0/0:1]
partition 1-5 interface-type t1;
```

**M13 or C-bit  
Parity-Mapped  
Configuration**

```
[edit interfaces coc48-0/0/0]
partition 1 oc-slice 1 interface-type coc1;

[edit interfaces coc1-0/0/0:1]
no-partition interface-type ct3;

[edit interfaces ct3-0/0/0:1]
partition 1-5 interface-type t1;
```

For a full configuration example, see the *Junos OS, Release 14.1*.

## Configuring Fractional T1 Interfaces

By default, all the time slots on a channelized T1 interface are used. To configure a fractional T1 interface on a Channelized OC48 IQE PIC, perform the following tasks:

1. Configure a T1 interface. For more information, see [“Configuring T1 Interfaces” on page 12](#).
2. Configure the number of time slots allocated to the T1 interface by including the **timeslots** statement at the **[edit interfaces t1-fpc/pic/port<:channel> t1-options]** hierarchy level:

```
[edit interfaces t1-fpc/pic/port<:channel> t1-options]
timeslots time-slot-range;
```

For channelized T1 interfaces, the time-slot range is from 1 through 24. You can designate any combination of time slots. To configure ranges, use hyphens. To configure discontinuous time slots, use commas. Do not include spaces. For more information, see *Configuring Fractional T1 Time Slots*.

### Example: Configuring Fractional T1 Interfaces

---

Configure a fractional T1 interface that uses time slots 1 through 5 and 10:

```
[edit interfaces coc48-0/0/0]
partition 1 oc-slice 1 interface-type coc1;
[edit interfaces coc1-0/0/0:1]
partition 1 interface-type t1;
[edit interfaces t1-0/0/0:1:1 t1-options]
timeslots 1-5,10;
```

For a full configuration example, see the *Junos OS, Release 14.1*.

## Configuring NxDS0 Interfaces

To configure NxDS0 interfaces on a Channelized OC48 IQE PIC, perform the following tasks:

1. Partition the channelized OC48 IQE interface into channelized OC1 interfaces by including the **partition**, **oc-slice**, and **interface-type** statements at the **[edit interfaces coc48-fpc/pic/port:channel]** hierarchy level, specifying the **coc1** interface type:

```
[edit interfaces coc48-fpc/pic/port:channel]
partition partition-number oc-slice oc-slice-range interface-type coc1;
```



2. If your network equipment uses VT mapping, partition the channelized OC1 interface into channelized T1 interfaces by including the **partition** and **interface-type** statements at the `[edit interfaces coc1-fpc/pic/port:channel]` hierarchy level, specifying the **ct1** interface type:

```
[edit interfaces coc1-fpc/pic/port:channel]
partition partition-number interface-type ct1;
```



**NOTE:** Class-of-service (CoS) rules cannot be applied to an individual channel configured on channelized IQE interfaces. You can only apply CoS rules to the aggregate bit streams.

If your network equipment uses M13 or C-bit parity, convert the channelized OC1 interface into a channelized T3 interface by including the **no-partition** and **interface-type** statements at the `[edit interfaces coc1-fpc/pic/port]` hierarchy level, specifying the **ct3** interface type:

```
[edit interfaces coc1-fpc/pic/port:channel]
no-partition partition-number interface-type ct3;
```



**NOTE:** Because the **no-partition** statement is included, this configuration task does not create another level of channelization, as denoted by the number of colons in the resulting interface.

3. Partition the channelized T3 interface into channelized T1 interfaces by including the **partition** and **interface-type** statements at the `[edit interfaces ct3-fpc/pic/port:channel]` hierarchy level, specifying the **ct1** interface type:

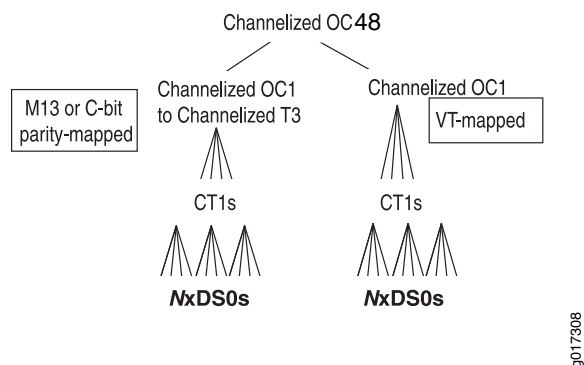
```
[edit interfaces ct3-fpc/pic/port:channel]
partition partition-number interface-type ct1;
```

4. Configure channelized NxDS0 interfaces on the channelized T1 interface by including the **partition**, **timeslots**, and **interface-type** statements at the `[edit interfaces ct1-fpc/pic/port:channel]` hierarchy level, specifying the **ds** interface type:

```
[edit interfaces ct1-fpc/pic/port:channel:channel]
partition partition-number timeslots time-slot-range interface-type ds;
```

Figure 5 on page 16 shows VT-mapped and M13 or C-bit parity-mapped configurations of NxDS0 interfaces.

Figure 5: Sample Channelization of OC48 IQE PIC



**Bold** entries correspond to actual packet channels.

### Example: Configuring NxDS0 Interfaces

Configure the following two NxDS0 interfaces with 10 time slots and 4 time slots, respectively:

	<code>ds-0/0/0:1:2:1</code> <code>ds-0/0/0:1:2:2</code>
<b>VT-Mapped Configuration</b>	<pre>[edit interfaces coc48-0/0/0] partition 1 oc-slice 1 interface-type coc1;  [edit interfaces coc1-0/0/0:1] partition 2 interface-type ct1;  [edit interfaces ct1-0/0/0:1:2] partition 1 timeslots 1-10 interface-type ds; partition 2 timeslots 12-15 interface-type ds;</pre>
<b>M13 or C-bit Parity-Mapped Configuration</b>	<pre>[edit interfaces coc48-0/0/0] partition 1 oc-slice 1 interface-type coc1;  [edit interfaces coc1-0/0/0:1] no-partition interface-type ct3;  [edit interfaces ct3-0/0/0:1] partition 2 interface-type ct1;  [edit interfaces ct1-0/0/0:1:2] partition 1 timeslots 1-10 interface-type ds; partition 2 timeslots 12-15 interface-type ds;</pre>

For a full configuration example, see the *Junos OS, Release 14.1*.

### Configuring Channelized OC48/STM16 IQE Interfaces (SDH Mode)

The Channelized OC48 IQE PIC configured for SDH mode creates a single channelized STM16 interface. You can configure the STM16 interface using the **partition** statement

at the `[edit interfaces cstm16-fpc/pic/port]` hierarchy level to partition it into the following OC slices:

- 16 channelized AU-4 interfaces or a path layer with 4 STM4 or 16 STM1 interfaces.
- 16 channelized AU-4 interfaces, each partitioned to 3 clear channel E3 interfaces or 63 CE1 or E1 (ITU-T or KLM) interfaces. Combination of E1, CE1 and E3 are not supported in a single cau4.
- 16 channelized AU-4 interfaces, each partitioned to 63 CE1 (ITU-T or KLM) interfaces each partitioned to 31 NxDS0 interfaces

This section describes how to configure the following channelized OC48 IQE interfaces on a Channelized OC48 IQE PIC configured in SDH mode:

- [Configuring a Channelized OC48/STM16 IQE PIC for SDH Mode on page 17](#)
- [Configuring Clear Channel STM1 and STM4 Interfaces on page 17](#)
- [Configuring Channelized AU-4 Interfaces on page 18](#)
- [Configuring E3 Interfaces on page 18](#)
- [Configuring E1 or Channelized E1 Interfaces on page 19](#)
- [Configuring NxDS0 IQE Interfaces on page 20](#)
- [Configuring T3 or Channelized T3 Interfaces on page 20](#)
- [Configuring T1 or Channelized T1 Interfaces on page 21](#)

## Configuring a Channelized OC48/STM16 IQE PIC for SDH Mode

To configure a Channelized OC48/STM16 IQE PIC to operate in SDH mode, include the `framing sdh` statement at the `[edit chassis fpc fpc/pic/port]` hierarchy level:

```
[edit chassis ]
  fpc 0 {
    pic 2 {
      framing sdh;
    }
  }
}
```

This configuration creates interface `cstm16-0/2/0`.

For more information, see the *Junos OS Administration Library for Routing Devices*.

## Configuring Clear Channel STM1 and STM4 Interfaces

On a Channelized OC48/STM16 IQE PIC, you can partition the CSTM16 transport layer into 4 clear channel STM4 interfaces or 16 clear channel STM1 interfaces. Combinations of STM4 and STM1 are also permitted, but you must observe the OC-slice parameters.

To configure an STM4 interface, include the `partition` and `interface-type` statements at the `[edit interfaces cstm16-fpc/pic/port]` hierarchy level:

```
[edit interfaces cstm16-fpc/pic/port]
  partition partition-number oc-slice oc-slice-range interface-type so;
```

This configuration creates interface *so-fpc/pic/port.channel*.

To configure an STM1 interface, include the **partition** and **interface-type** statements at the **[edit interfaces cstm16-fpc/pic/port]** hierarchy level:

```
[edit interfaces cstm16-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type so;
```

This configuration creates interface *so-fpc/pic/port.channel*.

## Configuring Channelized AU-4 Interfaces

To configure a channelized AU-4 interface, include the **partition**, **oc-slice**, and **interface-type** statements at the **[edit interfaces cstm16-fpc/pic/port:channel]** hierarchy level, specifying the **cau4** interface type:

```
[edit interfaces cstm16-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type cau4;
```

This configuration creates interface *cau4-fpc/pic/port:channel*.

The partition number is the sublevel interface partition index. For SDH interfaces, the partition number is not correlated with bandwidth size. For channelized OC48/STM16 IQE interfaces, channelized STM16 interface can have from 1 through 16 partition numbers and channel numbering begins with 1 (:1).

The OC-slice range is the range of SONET/SDH slices. For SDH interfaces, the OC-slice range specifies the bandwidth size required for the interface type you are configuring. The interface type is the channelized interface type or data channel you are creating.

### Example: Configuring Channelized AU-4 Interfaces

---

Configure channelized AU-4 interfaces:

```
[edit interfaces cstm16-0/2/0]
partition 1 oc-slice 1-3 interface-type cau4;
```

## Configuring E3 Interfaces

To configure E3 interfaces, include the **partition** and **interface-type** statements at the **[edit interfaces cau4-fpc/pic/port]** hierarchy level, specifying the **e3** interface type:

```
[edit interfaces]
cau4-fpc/pic/port {
  partition partition-number interface-type e3;
}
```

This configuration creates the interfaces *e3-fpc/pic/port:channel*.



**NOTE:** Class-of-service (CoS) rules cannot be applied to an individual channel configured on channelized IQE interfaces. You can only apply CoS rules to the aggregate bit streams.

---



**NOTE:** Channelized OC48/STM16 IQE interfaces in M Series, MX Series, and T Series routers reserve channels 0-3 of each OC12 space for STS3C SONET channels.

When you configure E3 or T3 channels in OC12 spaces on the described PICs, Junos OS allocates them starting from channel 4 because channels 0-3 are reserved for four STS3c SONET channels. Channel numbers are allocated sequentially in the following order: 4, 5, 6, 7, 8, 9, 11, 0, 1, 2, 3.

Only after channels 4 through 11 of the OC12 space are exhausted (all 4 through 11 configured) for E3 or T3 channels will Junos OS then allocate channel 0-3 space for further E3 or T3 channels; thereby using up the 0-3 space previously reserved for four STS3c SONET channels.

If a subsequent reconfiguration of this OC12 space occurs, where you try to replace channels 4-6 or 7-9 with an OC3 SONET channel; it fails because the channel 0-3 space is already occupied by the last E3 or T3 channels configured. This causes a failure in channel allocation and the Device Control Daemon (DCD) keeps retrying forever to configure the channel allocation on the interface. The only resolution is to reconfigure the last configured E3/T3 channels with OC3 channels, to free channels 0-3.

### Example: Configuring E3 Interfaces

Configure E3 interfaces, using partition 1:

```
[edit interfaces]
cau4-0/2/0:1 {
  partition 1 interface-type e3;
}
e3-0/2/0:1;
```

### Configuring E1 or Channelized E1 Interfaces

To configure E1 or channelized E1 interfaces, include the **partition** and **interface-type** statements at the **[edit interfaces cau4-fpc/pic/port]** hierarchy level, specifying the **e1** or **ce1** interface type:

```
[edit interfaces]
cau4-fpc/pic/port {
  partition partition-number interface-type e1;
}
cau4-fpc/pic/port {
  partition partition-number interface-type ce1;
}
```

This configuration creates the interfaces **e1-fpc/pic/port:channel** and **ce1-fpc/pic/port:channel**.



**NOTE:** Class-of-service (CoS) rules cannot be applied to an individual channel configured on channelized IQE interfaces. You can only apply CoS rules to the aggregate bit streams.

### Example: Configuring E1 and Channelized E1 Interfaces

Configure E1 or channelized E1 interfaces, using partition 3 and partition 4:

```
[edit interfaces]
cau4-0/2/0:1 {
  partition 3 interface-type e1;
}
cau4-0/2/0:1 {
  partition 4 interface-type ce1;
}
```

This configuration creates interfaces **e1-0/2/0:1:3** and **ce1-0/2/0:1:4**.

## Configuring NxDS0 IQE Interfaces

Configure channelized NxDS0 IQE interfaces on the channelized E1 IQE interface by including the **partition**, **timeslots**, and **interface-type** statements at the **[edit interfaces ce1-fpc/pic/port:channel]** hierarchy level, specifying the **ds** interface type:

```
[edit interfaces ce1-fpc/pic/port:channel:channel]
partition partition-number timeslots time-slot-range interface-type ds;
```

This configuration creates the interface **ds-fpc/pic/port:channel**.

The time-slot range is from 1 through 31. You can designate any combination of time slots. To configure ranges, use hyphens. To configure discontinuous time slots, use commas. You can use a combination of ranges and discontinuous time slots, for example:

```
1,9-18,21
```

### Example: Configuring NxDS0 IQE Interfaces

Configure channelized NxDS0 interfaces, using partition 4 and time slots 1 through 10:

```
[edit interfaces]
ce1-0/2/0:1:2:3 {
  partition 4 interface-type ds0 timeslots 1-10;
}
```

This configuration creates interface **ds0-0/2/0:1:2:3:4**.

## Configuring T3 or Channelized T3 Interfaces

To configure T3 or channelized T3 interfaces, include the **partition** and **interface-type** statements at the **[edit interfaces cau4-fpc/pic/port]** hierarchy level, specifying the **t3** or **ct3** interface type:

```
[edit interfaces]
cau4-fpc/pic/port {
  partition partition-number interface-type t3;
```

```

}
cau4-fpc/pic/port {
  partition partition-number interface-type ct3;
}

```

This configuration creates the interfaces **t3-fpc/pic/port:channel** and **t3-fpc/pic/port:channel**.



**NOTE:** Class-of-service (CoS) rules cannot be applied to an individual channel configured on channelized IQ interfaces. You can only apply CoS rules to the aggregate bit streams.

### Example: Configuring T3 or Channelized T3 Interfaces

Configure T3 and channelized T3 interfaces, using partition 1 and partition 2:

```

[edit interfaces]
cau4-0/2/0:1 {
  partition 1 interface-type t3;
}
cau4-0/2/0:1 {
  partition 2 interface-type ct3;
}
t3-0/2/0:1:1 ct3-0/2/0:1:2;

```

### Configuring T1 or Channelized T1 Interfaces

To configure T1 or channelized T1 interfaces, include the **partition** and **interface-type** statements at the **[edit interfaces cau4-fpc/pic/port]** hierarchy level, specifying the **t1** or **ct1** interface type:

```

[edit interfaces]
cau4-fpc/pic/port {
  partition partition-number interface-type t1;
}
cau4-fpc/pic/port {
  partition partition-number interface-type ct1;
}

```

This configuration creates the interfaces **t1-fpc/pic/port:channel** and **t1-fpc/pic/port:channel**.



**NOTE:** Class-of-service (CoS) rules cannot be applied to an individual channel configured on channelized IQ interfaces. You can only apply CoS rules to the aggregate bit streams.

### Example: Configuring T1 or Channelized T1 Interfaces

Configure T1 and channelized T1 interfaces, using partition 1 and partition 2:

```

[edit interfaces]
cau4-0/2/0:1 {

```

```
    partition 1 interface-type t1;
  }
  cau4-0/2/0:1 {
    partition 2 interface-type ct1;
  }
  t1-0/2/0:1:1 ct1-0/2/0:1:2;
```

## Configuring Link PIC Failover on Channelized OC48/STM16 IQE Interfaces

---

For Channelized OC48 IQE PICs used as linking PICs in redundant LSQ configurations, you can inhibit the router from sending PPP termination-request messages to the remote host if the link PIC fails. To do this, include the **no-termination-request** statement at the **[edit interfaces *interface-name* ppp-options]** hierarchy level:

```
no-termination-request;
```

The **no-termination-request** statement is supported only with MLPPP and SONET APS configurations and works with PPP, PPP over Frame Relay, and MLPPP interfaces only.

For information about interchassis and intrachassis LSQ failover, see the *Junos OS Services Interfaces Library for Routing Devices*.

## Example: Configuring Channelized OC48 Interfaces with Partitioned Channels

---

The following configuration is sufficient to get the channelized OC48 interface up and running. The OC48 interface can be divided into up to 4 OC12 channels, up to 16 OC3 channels, or up to 48 OC1 channels and combinations are permitted; for example, 1 OC12, 4 OC3s, and 24 OC1s. There are 48 OC1 slices available on the OC48 IQE interface. An OC48 configuration uses all 48 slices, each OC12 uses 12 slices, each OC1 uses 1 slice. Permissible combinations must fit within the 48 available OC1 slices. DS1 channels can use the following encapsulation types:

- PPP, PPP CCC, and PPP TCC
- Frame Relay, Frame Relay CCC, and Frame Relay TCC
- Cisco HDLC, Cisco HDLC CCC, and Cisco HDLC TCC

The channels can also have logical interfaces.

```
[edit interfaces]
t3-fpc/pic/port:0 {
  encapsulation cisco-hdlc;
  t3-options {
    compatibility-mode larscom;
    payload-scrambler;
  }
  unit 0 {
    family inet {
      address 10.11.30.1/30;
    }
    family iso;
  }
}
```



```
t3-fpc/pic/port:1 {
  encapsulation ppp;
  t3-options {
    compatibility-mode larscom;
    payload-scrambler;
  }
  unit 0 {
    family inet {
      address 10.11.30.5/30;
    }
    family iso;
  }
}
t3-fpc/pic/port:2 {
  encapsulation frame-relay;
  t3-options {
    compatibility-mode larscom;
    payload-scrambler;
  }
  unit 0 {
    dlci 100;
    family inet {
      address 10.11.30.9/30;
    }
    family iso;
  }
  unit 1 {
    dlci 101;
    family inet {
      address 10.11.31.9/30;
    }
    family iso;
  }
}
t3-lfpc/pic/port:3 {
  encapsulation cisco-hdlc-ccc;
  t3-options {
    compatibility-mode larscom;
    payload-scrambler;
  }
  unit 0;
}
t3-fpc/pic/port:4 {
  encapsulation ppp-ccc;
  t3-options {
    compatibility-mode larscom;
    payload-scrambler;
  }
  unit 0;
}
t3-fpc/pic/port:5 {
  dce;
  encapsulation frame-relay-ccc;
  t3-options {
    compatibility-mode larscom;
    payload-scrambler;
  }
}
```

```
}
unit 0 {
    encapsulation frame-relay-ccc;
    dlci 1000;
}
unit 1 {
    encapsulation frame-relay-ccc;
    dlci 1001;
}
}
```

**Related Documentation**

- *Channelized Interfaces Overview*

## CHAPTER 3

# Network Interfaces Configuration Statements and Hierarchy

- [\[edit chassis\] Hierarchy Level on page 25](#)
- [\[edit interfaces\] Hierarchy Level on page 26](#)
- [\[edit logical-systems\] Hierarchy Level on page 42](#)

### [\[edit chassis\] Hierarchy Level](#)

---

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
    }
    sonet {
      device-count number;
    }
  }
  maximum-links {
  }
  channel-group number {
    ethernet {
      device-count number;
    }
    fpc slot-number {
      pic pic-number {
        adaptive-services {
          service-package (layer-2 | layer-3);
        }
        aggregate-ports;
        atm-cell-relay-accumulation;
        atm-l2circuit-mode (aal5 | cell | trunk trunk);
        cel {
          el link-number {
            channel-group group-number;
            timeslots time-slot-range;
          }
        }
        channelization;
        ct1 {
          t1 link-number {
```

```

        channel-group group-number;
        timeslots time-slot-range;
    }
}
ct3 {
    port port-number {
        t1 link-number {
            channel-group group-number;
            timeslots time-slot-range;
        }
    }
    framing sdh;
}
max-queues-per-interface number;
mlfr-uni-nni-bundles num-intf;
no-concatenate;
shdsl {
    pic-mode (1-port-atm | 2-port-atm);
}
vtmapping (klm | itu-t);
}
}
fpc slot-number{
pic pic-number{
    account-layer2-overhead
    egress-policer-overhead bytes;
    ingress-policer-overhead bytes;
    mlfr-uni-nni-bundles-inline number;
    multi-link-layer-2-inline;
}
}
}

```

Related Documentation

- [Router Interfaces](#)

## [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 {
    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;
damping {
    enable;
    half-life seconds;
    max-suppress seconds;
    reuse number;
    suppress number;
}
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;
alias alias-name;
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);
                        }
                    }
                }
            }
        }
    }
}

```



---

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```

    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;
otn-options {
  fec (efec | gfec | none);
  (laser-enable | no-laser-enable);
  (line-loopback | no-line-loopback);
  pass-thru;
  rate (fixed-stuff-bytes | no-fixed-stuff-bytes | pass-thru);
  transmit-payload-type number;
  trigger (oc-lof | oc-lom | oc-los | oc-wavelength-lock | odu-ais | odu-bbe-th | odu-bdi
    | odu-es-th | odu-lck | odu-oci | odu-sd | odu-ses-th | odu-ttim | odu-uas-th |
    opu-ptm | otu-ais | otu-bbe-th | otu-bdi | otu-es-th | otu-fec-deg | otu-fec-exe |
    otu-iae | otu-sd | otu-ses-th | otu-ttim | otu-uas-th);
  tti;
}
optics-options {
  wavelength nm;
  alarm alarm-name {
    (syslog | link-down);
  }
  warning warning-name {
    (syslog | link-down);
  }
}
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 sn-vci-identifier;
psn-vpi 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;
                }
            }
        }
    }
    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;
    alias alias-name;
    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;
direct-connect;
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;
    disable-arp-policer
    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-beecn | no-translate-fecn-and-beecn);
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*



## CHAPTER 4

# Statement Summary

- [fast-aps-switch](#) on page 50
- [interface-type \(Interfaces\)](#) on page 51
- [no-termination-request](#) on page 52
- [oc-slice](#) on page 53
- [partition](#) on page 54
- [timeslots](#) on page 55

## fast-aps-switch

---

<b>Syntax</b>	fast-aps-switch;
<b>Hierarchy Level</b>	[edit interfaces <i>interface-name</i> sonet-options aps]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.1.
<b>Description</b>	(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.

**NOTE:**

- 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.
- 

<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Reducing APS Switchover Time in Layer 2 Circuits</i></li></ul>

## interface-type (Interfaces)

<b>Syntax</b>	<code>interface-type (bc   coc1   ct1   ct3   dc   ds   so   t1   t3);</code>
<b>Hierarchy Level</b>	<code>[edit interfaces <i>interface-range</i> name no-partition],</code> <code>[edit interfaces <i>interface-range</i> name <i>partition</i> <i>partition-number</i>],</code> <code>[edit interfaces <i>interface-range</i> name <i>partition</i> <i>partition-number</i> oc-slice <i>oc-slice-range</i>],</code> <code>[edit interfaces <i>interface-range</i> name <i>partition</i> <i>partition-number</i> timeslot <i>timeslot-range</i>]</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	For IQ and IQE interfaces only, configure the sublevel interface type.
<b>Options</b>	<p><b>bc</b>—Dual—Port Channelized E1 and T1 ISDN PRI interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> timeslot <i>timeslot-range</i>]</code> hierarchy level to create a bearer (B) channel <code>bc-pim/0/port:channel</code> interface for each time you want to function as an ISDN PRI B-channel.</p> <p><b>coc1</b>—Channelized OC1 interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> oc-slice <i>oc-slice-range</i> interface-type coc12-fpc/pic/port]</code> hierarchy level.</p> <p><b>ct1</b>—Channelized T1 interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> interface-type ct3-fpc/pic/port&lt;:channel&gt;]</code> hierarchy level.</p> <p><b>ct3</b>—Channelized T3 interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> oc-slice <i>oc-slice-range</i> interface-type coc1-fpc/pic/port:channel no-partition]</code> hierarchy level.</p> <p><b>dc</b>—Dual-Port Channelized E1 and T1 ISDN PRI interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> timeslot <i>timeslot-range</i>]</code> hierarchy level to create a (D) channel <code>dc-pim/0/port</code> to control the B-channels.</p> <p><b>ds</b>—DS0 interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> interface-type (ce1-fpc/pic/port   ct1-fpc/pic/port&lt;:channel&gt;)]</code> hierarchy level.</p> <p><b>so</b>—SONET/SDH interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> oc-slice <i>oc-slice-range</i> interface-type coc12-fpc/pic/port]</code> hierarchy level.</p> <p><b>t1</b>—T1 interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> oc-slice <i>oc-slice-range</i> interface-type (coc12-fpc/pic/port   coc1-fpc/pic/port)]</code> hierarchy level.</p> <p><b>t3</b>—T3 interface type. You can specify this interface type at the <code>[edit interfaces <i>interface-name</i> <i>partition</i> <i>partition-number</i> oc-slice <i>oc-slice-range</i> interface-type (coc12-fpc/pic/port   coc1-fpc/pic/port:channel no-partition)]</code> hierarchy level.</p>

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

**Related Documentation**

- *Channelized E1 IQ and IQE Interfaces Overview*
- *Channelized OC12/STM4 IQ and IQE Interfaces Overview*
- *Configuring Channelized T3 IQ Interfaces*

---

## no-termination-request

---

**Syntax** no-termination-request;

**Hierarchy Level** [edit interfaces *interface-name* ppp-options],  
[edit interfaces lsq-fpc/pic/port lsq-failure-options]

**Release Information** Statement introduced in Junos OS Release 7.4.  
Support at the [edit interfaces *interface-name* ppp-options] hierarchy level added in Junos OS Release 8.3.

**Description** For LSQ PICs or link PICs in redundant LSQ configurations, you can inhibit the router from sending PPP termination-request messages to the remote host if the PIC fails.

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

**Related Documentation**

- *Configuring Link PIC Failover on Channelized OC3 IQ and IQE Interfaces*
- *Configuring Link PIC Failover on Channelized OC12/STM4 IQ and IQE Interfaces*
- *Configuring Link PIC Failover on Channelized STM1 Interfaces*
- *Junos OS Services Interfaces Library for Routing Devices*

## oc-slice

<b>Syntax</b>	<code>oc-slice <i>oc-slice-range</i>;</code>
<b>Hierarchy Level</b>	[edit interfaces <i>interface-name</i> <b>partition</b> <i>partition-number</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	For channelized OC12 IQ interfaces only, configure the range of SONET/SDH slices.
<b>Default</b>	If you do not include either this statement or the <b>no-partition</b> statement, the Channelized OC12 IQ PICs not partitioned, and no data channels are configured.
<b>Options</b>	<p><b><i>oc-slice-range</i></b>—Range of SONET/SDH slices. OC3 interfaces must occupy three consecutive OC slices per interface, in the form 1–3, 4–6, 7–9, or 10–12. The T3, T1, and DS0 interface types each occupy one OC slice per interface.</p> <p><b>Range:</b> For OC3 interfaces, 1–3, 4–6, 7–9, or 10–12; for SONET/SDH and T3 interfaces, 1–12</p> <p>The remaining statement is explained separately.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Channelized OC12/STM4 IQ and IQE Interfaces Overview</i></li> </ul>

## partition

---

<b>Syntax</b>	<code>partition <i>partition-number</i> <b>oc-slice</b> <i>oc-slice-range</i> <b>interface-type</b> <i>type</i> <b>timeslots</b> <i>time-slot-range</i>;</code>
<b>Hierarchy Level</b>	[edit interfaces <i>interface-name</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	For IQ interfaces and J Series interfaces on the Dual-Port Channelized E1 and T1PIM, configure the channelized interface partition. The partition number is correlated with the channel number. Partition and channel numbering on IQ interfaces begins with :1, not :0.
<b>Default</b>	If you omit this statement, the channelized PIC or PIM is not partitioned, and no data channels are configured.
<b>Options</b>	<p><b><i>partition-number</i></b>—Sublevel interface partition index.</p> <p><b>Range:</b></p> <ul style="list-style-type: none"><li>• 1 through 4 for an OC3 interface on a channelized OC12 IQ interface.</li><li>• 1 through 12 for a T3 interface on a channelized OC12 IQ interface.</li><li>• 1 through 4 for a T3 interface on a channelized T3 IQ interface.</li><li>• 1 through 28 for a T1 IQ interface on a channelized OC12 IQ or channelized T3 IQ interface.</li><li>• 1 through 10 for an E1 interface on a channelized E1 IQ interface.</li><li>• 1 through 30 on a channelized E1 interface.</li><li>• 1 through 23 on a channelized T1 interface.</li><li>• 1 through 24 for NxDS0 interfaces on either channelized OC12 IQ or channelized DS3 IQ interfaces.</li><li>• 0 through 31 (with 0 reserved for framing) for NxDS0 interfaces on channelized E1 IQ interfaces.</li></ul> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Channelized E1 IQ and IQE Interfaces Overview</i></li><li>• <i>Channelized OC12/STM4 IQ and IQE Interfaces Overview</i></li><li>• <i>Configuring Channelized T3 IQ Interfaces</i></li><li>• <i>no-partition</i></li></ul>



## timeslots

<b>Syntax</b>	<code>timeslots <i>time-slot-range</i>;</code>
<b>Hierarchy Level</b>	[edit interfaces <i>e1-fpc/pic/port</i> ], [edit interfaces <i>t1-fpc/pic/port</i> ], [edit interfaces <i>interface-name</i> <i>e1-options</i> ], [edit interfaces <i>interface-name</i> <b>partition</b> <i>partition-number</i> ], [edit interfaces <i>interface-name</i> <i>t1-options</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	For E1 and T1 interfaces, allocate the specific time slots by number.



**NOTE:** When configuring E1 or T1 interfaces on the 10-port Channelized E1/T1 IQE PIC, the `timeslots` statement must be included at the [edit interfaces *e1-fpc/pic/port*] or [edit interfaces *t1-fpc/pic/port*] hierarchy level as appropriate.

<b>Options</b>	<p><b><i>time-slot-range</i></b>—Actual time slot numbers allocated:</p> <p><b>Range:</b> Ranges vary by interface type and configuration option as follows:</p> <ul style="list-style-type: none"> <li>• 1 through 24 for T1 interfaces (0 is reserved)</li> <li>• 1 through 31 for 4-port E1 PICs (0 is reserved)</li> <li>• 1 through 31 for NxDS0 interfaces (0 is reserved)</li> <li>• 2 through 32 for 10-port Channelized E1 and 10-port Channelized E1 IQ PICs (1 is reserved)</li> <li>• 2 through 32 for the setting under <b>e1-options</b> with IQE PICs (1 is reserved) (when creating fractional E1)</li> <li>• 1 through 31 for the setting under <b>partition</b> with IQE PICs (0 is reserved) (when creating NxDS0)</li> </ul>
----------------	--



**NOTE:** When creating fractional E1 interfaces only, if you connect a 4-port E1 PIC interface to a device that uses time slot numbering from 2 through 32, you must subtract 1 from the configured number of time slots.

<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Configuring Fractional E1 IQ and IQE Interfaces</i></li> <li>• <i>Configuring Fractional T1 IQ and IQE Interfaces</i></li> </ul>

- *Configuring Fractional E1 Time Slots*
- *Configuring Fractional T1 Time Slots*
- *Configuring a Channelized T1/E1 Interface to Drop and Insert Time Slots*

## PART 3

# Administration

- [Monitoring Commands on page 59](#)



## CHAPTER 5

# Monitoring Commands

- show interfaces (Aggregated SONET/SDH)
- show interfaces (Channelized DS3-to-DS0)
- show interfaces (Channelized DS3-to-DS1)
- show interfaces (Channelized E1 IQ)
- show interfaces (Channelized E1)
- show interfaces (Channelized OC12 IQ and IQE)
- show interfaces (Channelized OC12)
- show interfaces (Channelized OC3 IQ and IQE)
- show interfaces (Channelized OC48 IQ and IQE)
- show interfaces (Channelized STM1 IQ)
- show interfaces (Channelized STM1)
- show interfaces (Channelized T1 IQ)
- show interfaces (Channelized T3 IQ)
- show interfaces (SONET/SDH)
- show interfaces (T1, E1, or DS)
- show interfaces (T3 or E3)

## show interfaces (Aggregated SONET/SDH)

<b>Syntax</b>	<pre>show interfaces <i>asnumber</i> &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index <i>snmp-index</i>&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified aggregated SONET/SDH interface.
<b>Options</b>	<p><b><i>asnumber</i></b>—Display standard information about the specified aggregated SONET/SDH interface.</p> <p><b><i>brief   detail   extensive   terse</i></b>—(Optional) Display brief interface information.</p> <p><b><i>descriptions</i></b>—(Optional) Display interface description strings.</p> <p><b><i>media</i></b>—(Optional) Display media-specific information about network interfaces.</p> <p><b><i>snmp-index snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b><i>statistics</i></b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Understanding Aggregated SONET/SDH Interfaces</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show interfaces (Aggregated SONET) on page 64</a> <a href="#">show interfaces brief (Aggregated SONET) on page 64</a> <a href="#">show interfaces detail (Aggregated SONET) on page 64</a> <a href="#">show interfaces extensive (Aggregated SONET) on page 65</a>
<b>Output Fields</b>	<a href="#">Table 3 on page 60</a> lists the output fields for the <b>show interfaces</b> (aggregated SONET/SDH) command. Output fields are listed in the approximate order in which they appear.

Table 3: Aggregated SONET/SDH show interfaces Output Fields

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

Table 3: Aggregated SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Minimum links needed</b>	Number of child links that must be operational for the aggregated interface to be operational.	<b>detail extensive none</b>
<b>Device flags</b>	Information about the physical device. Possible values are described in the "Device Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the "Link Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Keepalive settings</b>	(PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> <li><b>interval seconds</b>—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds.</li> <li><b>up-count number</b>—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.</li> <li><b>down-count number</b>—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.</li> </ul>	All levels
<b>Last flapped</b>	Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>
<b>Input rate</b>	Input rate in bits per second (bps) and packets per second (pps).	None specified
<b>Output rate</b>	Output rate in bps and pps.	None specified
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>

Table 3: Aggregated SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Traffic statistics</b>	<p>Number of bytes and packets received and transmitted on the physical interface, and the traffic rate in bits per seconds (bps).</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Input errors</b>	<p>Input errors on the interface whose definitions are as follows:</p> <ul style="list-style-type: none"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Runts</b>—Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Giants</b>—Number of frames received that are larger than the giant threshold.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>MTU errors</b>—Number of packets whose size exceeds the MTU of the interface.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>Egress queues</b>	Total number of egress queues supported on the specified interface.	<b>detail extensive</b>
<b>Queue counters</b>	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> <li>• <b>Queued packets</b>—Number of queued packets.</li> <li>• <b>Transmitted packets</b>—Number of transmitted packets.</li> <li>• <b>Dropped packets</b>—Number of packets dropped by the ASIC's RED mechanism.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels



Table 3: Aggregated SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Index</b>	Logical interface's index number (which reflects its initialization sequence).	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface's SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Flags</b>	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>Bandwidth</b>	Interface bandwidth.	<b>detail extensive none</b>
<b>Statistics</b>	<p>Information about fragments and packets received and sent by the router. All references to traffic direction (input or output) are defined with respect to the router. Input fragments received by the router are assembled into input packets; output packets are segmented into output fragments for transmission out of the router.</p> <p>Statistics include input and output counts for packets, packets per second (pps), bytes, and bytes per second (Bps) for the following entities:</p> <ul style="list-style-type: none"> <li>• <b>Bundle</b>—Information about bundles.</li> <li>• <b>Link</b>—Information about links used in the multilink operation.</li> </ul>	<b>detail extensive none</b>
<b><i>protocol-family</i></b>	Protocol family configured on the logical interface. If the protocol is <b>inet</b> , the source and destination address are also displayed.	<b>brief</b>
<b>Protocol</b>	Protocol family configured on the logical interface.	<b>detail extensive none</b>
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive none</b>
<b>Flags</b>	Information about the protocol family flags. Possible values are described in the "Family Flags" section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table <b>inet.0</b> .	<b>detail extensive</b>
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the "Addresses Flags" section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive none</b>
<b>Local</b>	IP address of the logical interface.	<b>detail extensive none</b>
<b>Broadcast</b>	Broadcast address.	<b>detail extensive none</b>

Table 3: Aggregated SONET/SDH show interfaces Output Fields (*continued*)

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

```

user@host> show interfaces as0
Physical interface: as0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45
  Link-level type: PPP, MTU: 4474, Speed: 466560kbps, Minimum links needed: 1
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Last flapped   : Never
  Input rate     : 216 bps (1 pps)
  Output rate    : 48 bps (0 pps)

Logical interface as0.0 (Index 79) (SNMP ifIndex 55)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  Bandwidth: 311040kbps
  Statistics
  Bundle:
    Input :      1178      1      11772      176
    Output:         0         0         0         0
  Protocol inet, MTU: 4470
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.100.1.1, Local: 10.100.1.2

```

### show interfaces brief (Aggregated SONET)

```

user@host> show interfaces as0 brief
Physical interface: as0, Enabled, Physical link is Up
  Link-level type: PPP, MTU: 4474, Speed: 466560kbps
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3

Logical interface as0.0
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  inet 10.100.1.2 --> 10.100.1.1

```

### show interfaces detail (Aggregated SONET)

```

user@host> show interfaces as0 detail
Physical interface: as0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 45, Generation: 32
  Link-level type: PPP, MTU: 4474, Speed: 466560kbps, Minimum links needed: 1
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000

```

```

Link flags      : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Last flapped    : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :      15888      272 bps
  Output bytes :      6189      48 bps
  Input packets:      1547       2 pps
  Output packets:      393       0 pps
Egress queues: 4 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort      0              0              0
  1 expedited-fo      0              0              0
  2 assured-forw      0              0              0
  3 network-cont     196806         196806         0

```

```

Logical interface as0.0 (Index 79) (SNMP ifIndex 55) (Generation 18)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Bandwidth: 311040kbps
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :      1334      2      13332      232
  Output:      0      0      0      0
Link:
  so-0/0/0.0 <-- down
    Input :      0      0      0      0
    Output:      0      0      0      0
  so-0/0/1.0
    Input :      541      1      5406      120
    Output:      0      0      0      0
  so-0/0/2.0
    Input :      793      1      7926      112
    Output:      0      0      0      0
Protocol inet, MTU: 4470, Generation: 38, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.100.1.1, Local: 10.100.1.2, Broadcast: Unspecified,
Generation: 40

```

### show interfaces extensive (Aggregated SONET)

```

userhost1> show interfaces as0 extensive
Physical interface: as0, Enabled, Physical link is Up
Interface index: 149, SNMP ifIndex: 45, Generation: 32
Link-level type: PPP, MTU: 4474, Speed: 466560kbps, Minimum links needed: 1
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags : Keepalives
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Last flapped : Never
Statistics last cleared: Never
Traffic statistics:
  Input bytes :      17562      136 bps
  Output bytes :      6862      72 bps
  Input packets:      1710       1 pps
  Output packets:      436       0 pps

```

## Input errors:

Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,  
 Policed discards: 0, Resource errors: 0

## Output errors:

Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,  
 Resource errors: 0

Egress queues: 4 supported, 4 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 best-effort	0	0	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	196848	196848	0

Logical interface as0.0 (Index 79) (SNMP ifIndex 55) (Generation 18)

Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP

Bandwidth: 311040kbps

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

## Bundle:

Input :	1475	1	14742	136
Output:	0	0	0	0

## Link:

so-0/0/0.0 <-- down

Input :	0	0	0	0
Output:	0	0	0	0

so-0/0/1.0

Input :	598	0	5976	24
Output:	0	0	0	0

so-0/0/2.0

Input :	877	1	8766	112
Output:	0	0	0	0

Protocol inet, MTU: 4470, Generation: 38, Route table: 0

Flags: None

Addresses, Flags: Is-Preferred Is-Primary

Destination: 10.100.1.1, Local: 10.100.1.2, Broadcast: Unspecified,  
 Generation: 40

## show interfaces (Channelized DS3-to-DS0)

<b>Syntax</b>	<pre>show interfaces ds-fpc/pic/port:t1channel:ds0channel &lt;brief   detail   extensive&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index snmp-index&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized DS3-to-DS0 interface.
<b>Options</b>	<p><b>ds-fpc/pic/port:t1channel:ds0channel</b>—Display standard information about the specified channelized DS3-to-DS0 interface.</p> <p><b>brief   detail   extensive</b>—(Optional) Display the specified level of output interface.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index snmp-index</b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (Channelized DS3-to-DS0) on page 75</a>
<b>Output Fields</b>	<a href="#">Table 4 on page 67</a> lists the output fields for the <b>show interfaces</b> (all Channelized DS3 interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 4: Channelized DS3 show interfaces Output Fields

Field Name	Field Description	Level of Output
<b>Physical Interface</b>		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the "Enabled Field" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive</b> none
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive</b> none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>

Table 4: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	Reference clock source. It can be <b>Internal</b> or <b>External</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Mode</b>	Whether C-bit parity mode or M13 mode is enabled.	All levels
<b>Framing</b>	Physical layer framing format used on the link. It can be <b>ESF</b> or <b>SF</b> . The default is <b>ESF</b> .	All levels
<b>Parent</b>	(Channelized IQ interfaces only) Name and interface index of the interface to which a particular child interface belongs. <b>None</b> indicates that this interface is the top level.	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the "Device Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the "Link Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>
<b>Keepalive settings</b>	(PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> <li><b>interval seconds</b>—The time in seconds between successive keepalive requests. The range is <b>10</b> seconds through <b>32,767</b> seconds, with a default of <b>10</b> seconds.</li> <li><b>down-count number</b>—The number of keepalive packets that a destination must fail to receive before the network takes a link down. The range is <b>1</b> through <b>255</b>, with a default of <b>3</b>.</li> <li><b>up-count number</b>—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is <b>1</b> through <b>255</b>, with a default of <b>1</b>.</li> </ul>	<b>detail extensive none</b>

Table 4: 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"> <li><b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li>(<b>last seen 00:00:00 ago</b>)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>.</li> </ul> </li> <li><b>Output</b>—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"> <li>(<b>last seen 00:00:00 ago</b>)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>.</li> </ul> </li> </ul>	detail extensive none
LMI settings	<p>(Frame Relay) Settings for Local Management Interface (LMI) can be either <b>ANSI LMI settings</b> or <b>ITU LMI settings</b>. ANSI LMI settings is the default. The format is (ANSI or ITU) <b>LMI settings: value, value, value...xx</b> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li><b>n391dte</b>—DTE full status polling interval (1–255)</li> <li><b>n392dce</b>—DCE error threshold (1–10)</li> <li><b>n392dte</b>—DTE error threshold (1–10)</li> <li><b>n393dce</b>—DCE monitored event count (1–10)</li> <li><b>n393dte</b>—DTE monitored event count (1–10)</li> <li><b>t391dte</b>—DTE polling timer (5–30 seconds)</li> <li><b>t392dce</b>—DCE polling verification timer (5–30 seconds)</li> </ul>	detail extensive none
LMI	<p>(Frame Relay) LMI packet statistics:</p> <ul style="list-style-type: none"> <li><b>Input</b>—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 <b>Input: nn (last seen hh:mm:ss ago)</b>.</li> <li><b>Output</b>—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 <b>Output: nn (last seen hh:mm:ss ago)</b>.</li> </ul>	detail extensive none
LCP state	<p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> <li><b>Conf-ack-received</b>—Acknowledgement was received.</li> <li><b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li><b>Conf-req-sent</b>—Request was sent.</li> <li><b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li><b>Not-configured</b>—LCP is not configured on the interface.</li> <li><b>Opened</b>—LCP negotiation is successful.</li> </ul>	detail extensive none
NCP state	<p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> <li><b>Conf-ack-received</b>—Acknowledgement was received.</li> <li><b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li><b>Conf-req-sent</b>—Request was sent.</li> <li><b>Down</b>—NCP negotiation is incomplete (not yet completed or has failed).</li> <li><b>Not-configured</b>—NCP is not configured on the interface.</li> <li><b>Opened</b>—NCP negotiation is successful.</li> </ul>	detail extensive none

Table 4: Channelized DS3 show interfaces Output Fields (*continued*)

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



Table 4: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Input errors</b>	<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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Giants</b>—Number of frames received that are larger than the giant threshold.</li> <li>• <b>Runts</b>—Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Counter increments when the software could not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Count of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>SRAM errors</b>—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.</li> <li>• <b>HS link CRC errors</b>—Count of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> </ul>	<b>extensive</b>
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> </ul>	<b>extensive</b>

Table 4: 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"> <li>• <b>LOS</b>—Loss of signal.</li> <li>• <b>LOF</b>—Loss of frame.</li> <li>• <b>AIS</b>—Alarm indication signal.</li> <li>• <b>YLW</b>—Yellow alarm. Indicates errors at the remote site receiver.</li> </ul>	
T1 media	Counts of T1 media-specific errors. <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>The T1 media-specific error types can be:</p> <ul style="list-style-type: none"> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>BEE</b>—Bit error event</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>CS</b>—Carrier state</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>ES</b>—Errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds (section)</li> <li>• <b>SES</b>—Severely errored seconds</li> <li>• <b>BES</b>—Bit error seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	extensive

Table 4: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>DS3 media</b>	<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"> <li>• <b>PLL Lock</b>—Phase-locked loop out of lock</li> <li>• <b>Reframing</b>—Frame alignment recovery time</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>IDLE</b>—Idle code detected</li> <li>• <b>YELLOW</b>—Remote defect indication</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>CCV</b>—C-bit coding violation</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>PES</b>—P-bit errored seconds</li> <li>• <b>PSES</b>—P-bit errored seconds (section)</li> <li>• <b>CES</b>—C-bit errored seconds</li> <li>• <b>CSES</b>—C-bit severely errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	<b>extensive</b>
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Timeslots</b>—Configured time slots for the interface.</li> <li>• <b>Byte encoding</b>—Byte encoding used: <b>Nx64K</b> or <b>Nx56K</b>.</li> <li>• <b>Data inversion</b>—HDLC data inversion setting: <b>Enabled</b> or <b>Disabled</b></li> </ul>	<b>extensive</b>
<b>Interface transmit queues</b>	<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"> <li>• <b>B/W</b>—Queue bandwidth as a percentage of the total interface bandwidth.</li> <li>• <b>WRR</b>—Weighted round-robin (in percent).</li> <li>• <b>Packets</b>—Number of packets transmitted.</li> <li>• <b>Bytes</b>—Number of bytes transmitted.</li> <li>• <b>Drops</b>—Number of packets dropped.</li> <li>• <b>Errors</b>—Number of packet errors.</li> </ul>	<b>extensive</b>

Table 4: Channelized DS3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>DS1 or DS3 BERT configuration</b>	<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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	<b>detail extensive none</b>
<b>Packet Forwarding Engine configuration</b>	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>
<b>CoS information</b>	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Flags</b>	Information about the logical interface; values are described in the “Logical Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>Bandwidth</b>	Bandwidth configured on the interface.	All levels
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , <b>mpls</b> .	<b>detail extensive none</b>

Table 4: 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)

---

<b>Syntax</b>	<code>show interfaces t1-fpc/pic/port:t1channel</code> <code>&lt;brief   detail   extensive   terse&gt;</code> <code>&lt;descriptions&gt;</code> <code>&lt;media&gt;</code> <code>&lt;snmp-index <i>snmp-index</i>&gt;</code> <code>&lt;statistics&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized DS3-to-DS1 interface.
<b>Options</b>	<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>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (channelized DS3-to-DS1) on page 78</a>
<b>Output Fields</b>	See the output field table for the <a href="#">show interfaces (Channelized DS3-to-DS0) command</a> .

## 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)

<b>Syntax</b>	<code>show interfaces (ce1-fpc/pic/port   type-fpc/pic/port&lt;:channel&gt;)</code> <code>&lt;brief   detail   extensive   terse&gt;</code> <code>&lt;descriptions&gt;</code> <code>&lt;media&gt;</code> <code>&lt;snmp-index snmp-index&gt;</code> <code>&lt;statistics&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized E1 IQ interface.
<b>Options</b>	<p><b>type-fpc/pic/port:&lt;channel&gt;</b>—Interface type with optional corresponding channel levels. For the physical channelized E1 IQ interface, <b>type</b> is <b>ce</b>. For the clear channel, <b>type</b> is <b>e1</b>. At the first level of channelization, <b>type</b> is <b>ds</b>.</p> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index snmp-index</b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces (Channelized E1 IQ) (Physical) on page 81</a> <a href="#">show interfaces extensive (Channelized E1 IQ Multilink PPP Encapsulation) on page 82</a> <a href="#">show interfaces extensive (Channelized E1 IQ MLFR Encapsulation) on page 83</a> <a href="#">show interfaces detail (Clear Channel E1) on page 84</a>
<b>Output Fields</b>	For information about output fields, see the output field table for the <a href="#">show interfaces (Channelized E1)</a> 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)

<b>Syntax</b>	<pre>show interfaces ds-fpc/pic/port:ds0channel &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index snmp-index&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information the specified channelized E1 interface.
<b>Options</b>	<p><b>ds-fpc/pic/port:ds0channel</b>—Display standard information about the specified channelized E1 interface.</p> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index snmp-index</b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (Channelized E1) on page 93</a>
<b>Output Fields</b>	<a href="#">Table 5 on page 85</a> lists the output fields for the <b>show interfaces</b> (Channelized E1 and Channelized E1 IQ) command. Output fields are listed in the approximate order in which they appear.

**Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields**

Field Name	Field Description	Level of Output
<b>Physical Interface</b>		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the "Enabled Field" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	detail extensive none
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	detail extensive none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	detail extensive

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	Reference clock source: <b>Internal</b> or <b>External</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Framing</b>	Physical layer framing format used on the link. It can be <b>G704</b> , <b>G704-NO-CRC4</b> , or <b>Unframed</b> . The default is <b>G704</b> .	All levels
<b>Parent</b>	(Channelized E1 IQ interfaces only) Name and interface index of the interface to which a particular child interface belongs. <b>None</b> indicates that this interface is the top level.	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the "Device Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the "Link Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>
<b>Keepalive settings</b>	(PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> <li><b>Interval <i>seconds</i></b>—Time in seconds between successive keepalive requests. The range is <b>10</b> seconds through <b>32,767</b> seconds, with a default of <b>10</b> seconds.</li> <li><b>Down-count <i>number</i></b>—Number of keepalive packets a destination must fail to receive before the network takes a link down. The range is <b>1</b> through <b>255</b>, with a default of <b>3</b>.</li> <li><b>Up-count <i>number</i></b>—Number of keepalive packets a destination must receive to change a link's status from down to up. The range is <b>1</b> through <b>255</b>, with a default of <b>1</b>.</li> </ul>	<b>detail extensive none</b>



Table 5: 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"> <li><b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li>(<b>last seen 00:00:00 ago</b>)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>.</li> </ul> </li> <li><b>Output</b>—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"> <li>(<b>last seen 00:00:00 ago</b>)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>.</li> </ul> </li> </ul>	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 (<b>ANSI or ITU</b>) <b>LMI settings: value, value...xx</b> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li><b>n391dte</b>—DTE full status polling interval (1–255)</li> <li><b>n392dce</b>—DCE error threshold (1–10)</li> <li><b>n392dte</b>—DTE error threshold (1–10)</li> <li><b>n393dce</b>—DCE monitored event count (1–10)</li> <li><b>n393dte</b>—DTE monitored event count (1–10)</li> <li><b>t391dte</b>—DTE polling timer (5–30 seconds)</li> <li><b>t392dce</b>—DCE polling verification timer (5–30 seconds)</li> </ul>	detail extensive none
LMI	<p>(Frame Relay) Statistics about the link management.</p> <ul style="list-style-type: none"> <li><b>Input</b>—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 <b>Input: nn (last seen hh:mm:ss ago)</b></li> <li><b>Output</b>—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 <b>Output: nn (last sent hh:mm:ss ago)</b>.</li> </ul>	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"> <li><b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li><b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li><b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li><b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	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"> <li><b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li><b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li><b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li><b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	detail extensive none

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Common statistics</b>	<p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> <li>• <b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li>• <b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li>• <b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li>• <b>Keepalive responses timedout</b>—Number of keepalive responses that timed out when no LMI packet was reported for <code>n392dte</code> or <code>n393dce</code> intervals. (See <b>LMI settings</b>).</li> </ul>	<b>detail extensive none</b>
<b>Nonmatching DCE-end DLCIs</b>	(Frame Relay, displayed only from the DTE) Number of DLCIs configured from the DCE.	<b>detail extensive none</b>
<b>LCP state</b>	<p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—LCP is not configured on the interface.</li> <li>• <b>Opened</b>—LCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>CHAP state</b>	<p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> <li>• <b>Chap-Chal-received</b>—Challenge was received but response not yet sent.</li> <li>• <b>Chap-Chal-sent</b>—Challenge was sent.</li> <li>• <b>Chap-Resp-received</b>—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.)</li> <li>• <b>Chap-Resp-sent</b>—Response was sent for the challenge received.</li> <li>• <b>Closed</b>—CHAP authentication is incomplete.</li> <li>• <b>Failure</b>—CHAP authentication failed.</li> <li>• <b>Not-configured</b>—CHAP is not configured on the interface.</li> <li>• <b>Success</b>—CHAP authentication was successful.</li> </ul>	<b>detail extensive none</b>
<b>Last flapped</b>	Date, time, and how long ago the interface went down to up. The format is <b>Last flapped: <i>year-month-day hour:minute:second timezone (hour:minute:second ago)</i></b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>
<b>CoS Queues</b>	Number of CoS queues configured.	<b>detail extensive none</b>
<b>Input Rate</b>	Input rate in bits per second (bps) and packets per second (pps).	None specified
<b>Output Rate</b>	Output rate in bps and pps.	None specified
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Traffic statistics</b>	<p>Number of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Input errors</b>	<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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Giants</b>—Number of frames received that are larger than the giant threshold.</li> <li>• <b>Runts</b>—Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Number of times the software did not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> <li>• <b>MTU errors</b>—Number of packets larger than the MTU threshold.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>DS1 alarms</b> <b>DS1 defects</b>	<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"> <li>• <b>LOS</b>—Loss of signal.</li> <li>• <b>LOF</b>—Loss of frame.</li> <li>• <b>AIS</b>—Alarm indication signal.</li> <li>• <b>YLW</b>—Yellow alarm. Indicates errors at the remote site receiver.</li> </ul>	<b>detail extensive none</b>

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>E1 media</b>	<p>Active alarms and defects, plus counts of specific E1 errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than OK indicates a problem.</li> </ul> <p>The E1 media-specific error types can be:</p> <ul style="list-style-type: none"> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>BEE</b>—Bit error</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>CS</b>—Carrier state</li> <li>• <b>FEBS</b>—Far-end block error</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>ES</b>—Errored seconds</li> <li>• <b>BES</b>—Bursty errored seconds</li> <li>• <b>SES</b>—Severely errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	<b>extensive</b>
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Timeslots</b>—Configured time slots for the interface.</li> <li>• <b>Line encodingHDB3</b>—Line encoding used.</li> </ul>	<b>extensive</b>
<b>Interface transmit queues</b>	<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"> <li>• <b>B/W</b>—Queue bandwidth as a percentage of the total interface bandwidth.</li> <li>• <b>WRR</b>—Weighted round robin (in percent).</li> <li>• <b>Packets</b>—Number of packets transmitted.</li> <li>• <b>Bytes</b>—Number of bytes transmitted.</li> <li>• <b>Drops</b>—Number of packets dropped.</li> <li>• <b>Errors</b>—Number of packet errors.</li> </ul>	<b>extensive</b>

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>DSx BERT configuration</b>	<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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	<b>detail extensive none</b>
<b>Packet Forwarding Engine configuration</b>	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>
<b>CoS information</b>	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Flags</b>	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>Input packets</b>	Number of packets received on the logical interface.	None specified
<b>Output packets</b>	Number of packets transmitted on the logical interface.	None specified

Table 5: Channelized E1 and Channelized E1 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Traffic statistics</b>	Number and rate of bytes and packets received and transmitted on the logical interface. <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Local statistics</b>	(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.	<b>detail extensive</b>
<b>Transit statistics</b>	(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.	<b>detail extensive</b>
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , <b>mpls</b> .	<b>detail extensive none</b>
<b>Multilink bundle</b>	(Multilink) Interface name for the multilink bundle, if configured.	<b>detail extensive none</b>
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table <b>inet.0</b> .	<b>detail extensive</b>
<b>DLCI</b>	(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b> , <b>Total down time</b> , <b>Last down</b> , and <b>Traffic statistics</b> . <b>Flags</b> is one or more of the following: <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when link is active, but no information is received from the DCE.</li> <li>• <b>Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>Dce-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive none</b>
<b>DLCI statistics</b>	(Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive none</b>

## 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.

<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (CAU4 on Channelized OC-12 IQ) on page 97</a> <a href="#">show interfaces extensive (Channelized OC1 on Channelized OC12 IQ) on page 97</a> <a href="#">show interfaces extensive (Channelized OC12 IQ) (Physical) on page 97</a> <a href="#">show interfaces extensive (Channelized T1 from Channelized OC12 IQ) on page 98</a> <a href="#">show interfaces extensive (Channelized T3 on Channelized OC12 IQ) on page 98</a> <a href="#">show interfaces extensive (CSTM4 on Channelized OC-12 IQ) on page 98</a> <a href="#">show interfaces extensive (DS0 on Channelized OC12 IQ) on page 98</a> <a href="#">show interfaces extensive (SONET Interface on Channelized OC12 IQ) on page 98</a> <a href="#">show interfaces extensive (T1 on Channelized OC12 IQ) on page 99</a>
<b>Output Fields</b>	See the output field table for the <a href="#">show interfaces (Channelized OC3 IQ and IQE)</a> 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: t1-0/2/0:1:1:1, 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)

---

<b>Syntax</b>	<code>show interfaces t3-fpc/pic/port:t3channel</code> <brief   detail   extensive   terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	Display status information about the specified channelized OC12 interface.
<b>Options</b>	<b>t3-fpc/pic/port:t3channel</b> —Display standard information about the specified channelized OC12 interface.  <b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output.  <b>descriptions</b> —(Optional) Display interface description strings.  <b>media</b> —(Optional) Display media-specific information about network interfaces.  <b>snmp-index <i>snmp-index</i></b> —(Optional) Display information for the specified SNMP index of the interface.  <b>statistics</b> —(Optional) Display static interface statistics.
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (Channelized OC12) on page 100</a>
<b>Output Fields</b>	See the output field table for the <a href="#">show interfaces (Channelized OC3 IQ and IQE)</a> 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)

---

<b>Syntax</b>	<code>show interfaces (<i>type-fpc/pic/port</i> &lt;:<i>channel</i>&gt;&lt;:<i>channel</i>&gt;&lt;:<i>channel</i>&gt; &lt;<i>brief</i>   <i>detail</i>   <i>extensive</i>   <i>terse</i>&gt; &lt;<i>descriptions</i>&gt; &lt;<i>media</i>&gt; &lt;<i>snmp-index snmp-index</i>&gt; &lt;<i>statistics</i>&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized OC3 IQ or IQE interface.
<b>Options</b>	<p><b><i>type-fpc/pic/port:channel:channel:channel</i></b>—Interface type with optional corresponding channel levels. The interface type can be one of the following:</p> <ul style="list-style-type: none"><li>• <b><i>type-fpc/pic/port</i></b>—For the physical interface, <b><i>type</i></b> is <b><i>coc3</i></b>. For the clear channel, <b><i>type</i></b> is <b><i>so</i></b> (for OC3).</li><li>• <b><i>type-fpc/pic/port:channel</i></b>—At the first level of channelization, <b><i>type</i></b> can be <b><i>coc1</i></b> (channelized OC1), <b><i>ct3</i></b> (from <b><i>coc1</i></b>), or <b><i>t3</i></b> (from <b><i>coc1</i></b>).</li><li>• <b><i>type-fpc/pic/port:channel:channel</i></b>—At the second level of channelization, <b><i>type</i></b> can be <b><i>ct1</i></b> (from <b><i>coc1</i></b> or <b><i>ct3</i></b>) or <b><i>t1</i></b> (from <b><i>coc1</i></b> or <b><i>ct3</i></b>).</li><li>• <b><i>type-fpc/pic/port:channel:channel:channel</i></b>—At the third level of channelization, <b><i>type</i></b> can be <b><i>ds</i></b> (from <b><i>ct1</i></b>).</li></ul> <p><b><i>brief</i>   <i>detail</i>   <i>extensive</i>   <i>terse</i></b>—(Optional) Display the specified level of output.</p> <p><b><i>descriptions</i></b>—(Optional) Display interface description strings.</p> <p><b><i>media</i></b>—(Optional) Display media-specific information about network interfaces.</p> <p><b><i>snmp-index snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b><i>statistics</i></b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<p><a href="#">show interfaces extensive (Channelized OC3 IQ) (Physical) on page 118</a></p> <p><a href="#">show interfaces extensive (Channelized OC1 on Channelized OC3 IQ) on page 119</a></p> <p><a href="#">show interfaces extensive (Channelized T1 on Channelized OC3 IQ) on page 120</a></p> <p><a href="#">show interfaces extensive (DSO on Channelized OC3 IQ) on page 121</a></p>
<b>Output Fields</b>	<p><a href="#">Table 6 on page 105</a> lists the output fields for the <b>show interfaces</b> (all Channelized OC interfaces) command. Output fields are listed in the approximate order in which they appear.</p>

Table 6: Channelized OC show interfaces Output Fields

Field Name	Field Description	Level of Output
<b>Physical Interface</b>		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive none</b>
<b>Description</b>	Interface description.	All levels
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	SONET/SDH reference clock source. It can be <b>Internal</b> or <b>External</b> . Clocking is configured and displayed only for channel 0.	All levels
<b>Framing mode</b>	Framing mode: <b>SONET</b> or <b>SDH</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>SONET loopback</b>	Whether loopback is enabled on a SONET/SDH interface, and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16-bit</b> .	All levels
<b>Payload scrambler</b>	Whether payload scrambling is enabled.	All levels
<b>Parent</b>	Name and interface index of the interface to which a particular child interface belongs. <b>None</b> indicates that this interface is the top level.	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the “Device Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>ANSI or ITU LMI settings</b>	<p>(Frame Relay) Settings for Local Management Interface (LMI). The format is (ANSI or ITU) LMI settings: <i>value</i>, <i>value... nn</i> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li>• <b>n391dte</b>—DTE full status polling interval (1–255)</li> <li>• <b>n392dce</b>—DCE error threshold (1–10)</li> <li>• <b>n392dte</b>—DTE error threshold (1–10)</li> <li>• <b>n393dce</b>—DCE monitored event count (1–10)</li> <li>• <b>n393dte</b>—DTE monitored event count (1–10)</li> <li>• <b>t391dte</b>—DTE polling timer (5–30 seconds)</li> <li>• <b>t392dce</b>—DCE polling verification timer (5–30 seconds)</li> </ul>	All levels
<b>LMI statistics</b>	<p>(Frame Relay) Statistics about the link management.</p> <ul style="list-style-type: none"> <li>• <b>Input</b>—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 <b>Input: <i>nn</i> (last sent <i>hh:mm:ss</i> ago)</b>.</li> <li>• <b>Output</b>—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 <b>Output: <i>nn</i> (last sent <i>hh:mm:ss</i> ago)</b>.</li> </ul>	detail extensive
<b>DTE statistics</b>	<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"> <li>• <b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li>• <b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li>• <b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li>• <b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	detail extensive none
<b>DCE statistics</b>	<p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> <li>• <b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li>• <b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li>• <b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li>• <b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	detail extensive none
<b>Common statistics</b>	<p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> <li>• <b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li>• <b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li>• <b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li>• <b>Keepalive responses timedout</b>—Number of keepalive responses that timed out when no LMI packet was reported for <b>n392dte</b> or <b>n393dce</b> intervals. (See LMI settings.)</li> </ul>	detail extensive none

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Nonmatching DCE-end DLCIs</b>	(Frame Relay) Number of DLCIs configured from the DCE, displayed only from the DTE.	<b>detail extensive none</b>
<b>Last flapped</b>	Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: <i>year-month-day hh:mm:ss timezone year-month-day (hh:mm:ss ago)</i></b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>
<b>CoS Queues</b>	Number of CoS queues configured.	<b>detail extensive none</b>
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>
<b>DS1 alarms</b> <b>DS1 defects</b>	<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"> <li>• <b>LOS</b>—Loss of signal.</li> <li>• <b>LOF</b>—Loss of frame.</li> <li>• <b>AIS</b>—Alarm indication signal.</li> <li>• <b>YLW</b>—Yellow alarm. Indicates errors at the remote site receiver.</li> </ul>	<b>detail extensive none</b>

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>T1 media</b>	<p>Counts of T1 or E1 media-specific errors.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>The T1 or E1 media-specific error types are:</p> <ul style="list-style-type: none"> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>BEE</b>—Bit error</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>CS</b>—Carrier state</li> <li>• <b>FEBE</b>—Far-end block error (E1 only)</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>ES</b>—Errored seconds</li> <li>• <b>BES</b>—Bit error seconds</li> <li>• <b>SES</b>—Severely errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	<b>extensive</b>
<b>Traffic statistics</b>	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Input errors</b>	<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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Runts</b>—Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Giants</b>—Number of frames received that are larger than the giant threshold.</li> <li>• <b>Bucket Drops</b>—Drops caused by traffic load exceeding the interface transmit/receive leaky bucket configuration. The default is off.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Number of times the software did not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>SRAM errors</b>—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.</li> <li>• <b>HS link FIFO overflows</b>—Number of FIFO overflows on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> <li>• <b>HS link FIFO underflows</b>—Number of FIFO underflows on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>MTU errors</b>—Number of packets whose size exceeds the MTU of the interface.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>Egress queues</b>	Total number of egress queues supported on the specified interface.	<b>detail extensive</b>
<b>Queue counters</b>	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> <li>• <b>Queued packets</b>—Number of queued packets.</li> <li>• <b>Transmitted packets</b>—Number of transmitted packets.</li> <li>• <b>Dropped packets</b>—Number of packets dropped by the ASIC's RED mechanism.</li> </ul>	<b>detail extensive</b>
<b>Active alarms</b>	Defects that can prevent the interface from passing packets:	<b>detail extensive</b>
<b>Active defects</b>	<ul style="list-style-type: none"> <li>• <b>None</b>—There are no active defects or alarms.</li> <li>• <b>LOF</b>—Loss of frame.</li> </ul>	
<b>SONET alarms</b>	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
<b>SONET defects</b>	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: <b>SONET PHY</b> , <b>SONET section</b> , <b>SONET line</b> , and <b>SONET path</b> .	



Table 6: 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"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>BIP-B2</b>—Bit interleaved parity for SONET line overhead</li> <li>• <b>REI-V</b>—Remote error indication (near-end VT)</li> <li>• <b>LOP-V</b>—Loss of pointer (near-end VT)</li> <li>• <b>AIS-V</b>—Alarm indication signal (near-end VT)</li> <li>• <b>RDI-V</b>—Remote defect indication (near-end VT)</li> <li>• <b>UNEQ-V</b>—Unequipped (near-end VT)</li> <li>• <b>PLM-V</b>—Payload label mismatch (near-end VT)</li> <li>• <b>ES-V</b>—Errored seconds (near-end VT)</li> <li>• <b>SES-V</b>—Severely errored seconds (near-end VT)</li> <li>• <b>UAS-V</b>—Unavailable seconds (near-end VT)</li> <li>• <b>ES-VFE</b>—Errored seconds (far-end VT)</li> <li>• <b>SES-VFE</b>—Severely errored seconds (far-end VT)</li> <li>• <b>UAS-VFE</b>—Unavailable seconds (far-end VT)</li> </ul>	extensive
SONET PHY	<p>Counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>PLL Lock</b>—Phase-locked loop</li> <li>• <b>PHY Light</b>—Loss of optical signal</li> </ul>	extensive
SONET section	<p>Counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>BIP-B1</b>—Bit interleaved parity for SONET section overhead</li> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>LOL</b>—Loss of light</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>ES-S</b>—Errored seconds (section)</li> <li>• <b>SES-S</b>—Severely errored seconds (section)</li> <li>• <b>SEFS-S</b>—Severely errored framing seconds (section)</li> </ul>	extensive

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SONET line</b>	<p>Active alarms and defects, plus counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>BIP-B2</b>—Bit interleaved parity for SONET line overhead</li> <li>• <b>REI-L</b>—Remote error indication (near-end line)</li> <li>• <b>RDI-L</b>—Remote defect indication (near-end line)</li> <li>• <b>AIS-L</b>—Alarm indication signal (near-end line)</li> <li>• <b>BERR-SF</b>—Bit error rate fault (signal failure)</li> <li>• <b>BERR-SD</b>—Bit error rate defect (signal degradation)</li> <li>• <b>ES-L</b>—Errored seconds (near-end line)</li> <li>• <b>SES-L</b>—Severely errored seconds (near-end line)</li> <li>• <b>UAS-L</b>—Unavailable seconds (near-end line)</li> <li>• <b>ES-LFE</b>—Errored seconds (far-end line)</li> <li>• <b>SES-LFE</b>—Severely errored seconds (far-end line)</li> <li>• <b>UAS-LFE</b>—Unavailable seconds (far-end line)</li> </ul>	<b>extensive</b>
<b>SONET path</b>	<p>Active alarms and defects, plus counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>BIP-B3</b>—Bit interleaved parity for SONET section overhead</li> <li>• <b>REI-P</b>—Remote error indication</li> <li>• <b>LOP-P</b>—Loss of pointer (path)</li> <li>• <b>AIS-P</b>—Path alarm indication signal</li> <li>• <b>RDI-P</b>—Path remote defect indication</li> <li>• <b>UNEQ-P</b>—Path unequipped</li> <li>• <b>PLM-P</b>—Path payload (signal) label mismatch</li> <li>• <b>ES-P</b>—Errored seconds (near-end STS path)</li> <li>• <b>SES-P</b>—Severely errored seconds (near-end STS path)</li> <li>• <b>UAS-P</b>—Unavailable seconds (near-end STS path)</li> <li>• <b>ES-PFE</b>—Errored seconds (far-end STS path)</li> <li>• <b>SES-PFE</b>—Severely errored seconds (far-end STS path)</li> <li>• <b>UAS-PFE</b>—Unavailable seconds (far-end STS path)</li> </ul>	<b>extensive</b>

Table 6: 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><b>NOTE:</b> For controller based SONET PICs, the SDH alarms and SDH defects output in the <b>show interface coc3 extensive</b> 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"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>PLL Lock</b>—Phase-locked loop</li> <li>• <b>PHY Light</b>—Loss of optical signal</li> </ul>	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"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>RS-BIP8</b>—24-bit BIP for multiplex section overhead (B2 bytes)</li> <li>• <b>OOF</b>—Out of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>RS-ES</b>—Errored seconds (near-end regenerator section)</li> <li>• <b>RS-SES</b>—Severely errored seconds (near-end regenerator section)</li> <li>• <b>RS-SEFS</b>—Severely errored framing seconds (regenerator section)</li> </ul>	extensive

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SDH multiplex section</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>MS-BIP24</b>—8-bit BIP for high-order path overhead (B3 byte)</li> <li>• <b>MS-FEBE</b>—Far-end block error (multiplex section)</li> <li>• <b>MS-FERF</b>—Far-end remote fail (multiplex section)</li> <li>• <b>MS-AIS</b>—alarm indication signal (multiplex section)</li> <li>• <b>BERR-SF</b>—Bit error rate fault (signal failure)</li> <li>• <b>BERR-SD</b>—Bit error rate defect (signal degradation)</li> <li>• <b>MS-ES</b>—Errored seconds (near-end multiplex section)</li> <li>• <b>MS-SES</b>—Severely errored seconds (near-end multiplex section)</li> <li>• <b>MS-UAS</b>—Unavailable seconds (near-end multiplex section)</li> <li>• <b>MS-ES-FE</b>—Errored seconds (far-end multiplex section)</li> <li>• <b>MS-SES-FE</b>—Severely errored seconds (far-end multiplex section)</li> <li>• <b>MS-UAS-FE</b>—Unavailable seconds (far-end multiplex section)</li> </ul>	<b>extensive</b>
<b>SDH path</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>HP-BIP8</b>—8-bit BIP for regenerator section overhead (B1 byte)</li> <li>• <b>HP-FEBE</b>—Far-end block error (high-order path)</li> <li>• <b>HP-LOP</b>—Loss of pointer (high-order path)</li> <li>• <b>HP-AIS</b>—High-order-path alarm indication signal</li> <li>• <b>HP-FERF</b>—Far-end remote fail (high-order path)</li> <li>• <b>HP-UNEQ</b>—Unequipped (high-order path)</li> <li>• <b>HP-PLM</b>—Payload label mismatch (high-order path)</li> <li>• <b>HP-ES</b>—Errored seconds (near-end high-order path)</li> <li>• <b>HP-SES</b>—Severely errored seconds (near-end high-order path)</li> <li>• <b>HP-UAS</b>—Unavailable seconds (near-end high-order path)</li> <li>• <b>HP-ES-FE</b>—Errored seconds (far-end high-order path)</li> <li>• <b>HP-SES-FE</b>—Severely errored seconds (far-end high-order path)</li> <li>• <b>HP-UAS-FE</b>—Unavailable seconds (far-end high-order path)</li> </ul>	<b>extensive</b>

Table 6: 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"> <li>• <b>C2</b>—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P.</li> <li>• <b>F1</b>—Section user channel byte. This byte is set aside for the purposes of users.</li> <li>• <b>K1</b> and <b>K2</b>—These bytes are allocated for APS signaling for the protection of the multiplex section.</li> <li>• <b>J0</b>—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.</li> <li>• <b>S1</b>—Synchronization status. The S1 byte is located in the first STS-1 of an STS-<i>N</i>.</li> <li>• <b>Z3</b> and <b>Z4</b>—Allocated for future use.</li> </ul>	
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"> <li>• <b>PLL Lock</b>—Phase-locked loop out of lock</li> <li>• <b>Reframing</b>—Frame alignment recovery time</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>IDLE</b>—Idle code detected</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—(DS3 only) Pulse code violation</li> <li>• <b>CCV</b>—(DS3 only) C-bit coding violation</li> <li>• <b>FEBE</b>—(DS3 only) Far-end block error</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>PES</b>—(DS3 only) P-bit errored seconds</li> <li>• <b>PSES</b>—(DS3 only) P-bit errored seconds (section)</li> <li>• <b>CES</b>—(DS3 only) C-bit errored seconds</li> <li>• <b>CSES</b>—(DS3 only) C-bit severely errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	extensive

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Policing bucket</b>—Configured state of the receiving policer.</li> <li>• <b>Shaping bucket</b>—Configured state of the transmitting shaper.</li> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Timeslots</b>—Configured time slots for the interface.</li> <li>• <b>Line encoding</b>—Line encoding used. It is always <b>HDB3</b>.</li> <li>• <b>Byte encoding</b>—(T1 only) Byte encoding used: <b>Nx64K</b> or <b>Nx56K</b>.</li> <li>• <b>Line encoding</b>—Line encoding used. For T1, the value can be <b>B8ZS</b> or <b>AMI</b>. For E1, the value is <b>HDB3</b>.</li> <li>• <b>Data inversion</b>—HDLC data inversion setting: <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Idle cycle flag</b>—Idle cycle flags.</li> <li>• <b>Start end flag</b>—Start and end flag.</li> </ul>	<b>extensive</b>
<b>Interface transmit queues</b>	<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"> <li>• <b>B/W</b>—Queue bandwidth as a percentage of the total interface bandwidth.</li> <li>• <b>WRR</b>—Weighted round-robin (in percent).</li> <li>• <b>Packets</b>—Number of packets transmitted.</li> <li>• <b>Bytes</b>—Number of bytes transmitted.</li> <li>• <b>Drops</b>—Number of packets dropped.</li> <li>• <b>Errors</b>—Number of packet errors.</li> </ul>	<b>extensive</b>
<b>DSU configuration</b>	<p>Information about the DSU configuration. The last three lines (<b>Bit count</b>, <b>Error bit count</b>, and <b>LOS information</b>) are displayed only if a BERT has ever been run on the interface.</p> <ul style="list-style-type: none"> <li>• <b>Compatibility mode</b>—CSU/DSU compatibility mode: <b>None</b>, <b>Larscom</b>, <b>Kentrox</b>, or <b>Digital-Link</b>.</li> <li>• <b>Scrambling</b>—Payload scrambling. It can be <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Subrate</b>—Configured subrate setting. Applies only when <b>Digital-Link</b> compatibility mode is used. It can be <b>Disabled</b> or display units in kbps.</li> <li>• <b>FEAC loopback</b>—(T3) Whether a far-end alarm and control (FEAC) loopback is <b>Active</b> or <b>Inactive</b>. 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.</li> <li>• <b>Response</b>—Whether the FEAC signal is <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Count</b>—Number of FEAC loopbacks.</li> </ul>	<b>extensive</b>
<b>BERT configuration</b>	<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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	<b>detail extensive none</b>

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Packet Forwarding Engine configuration</b>	Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>
<b>CoS information</b>	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Flags</b>	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>Traffic statistics</b>	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"> <li>• <b>Input rate</b>—Rate of bits and packets received on the interface.</li> <li>• <b>Output rate</b>—Rate of bits and packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Local statistics</b>	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.	<b>detail extensive</b>

Table 6: Channelized OC show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Transit statistics</b>	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.	<b>detail extensive</b>
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , or <b>mpls</b> .	<b>detail extensive none</b>
<b>Multilink bundle</b>	(If the logical interface is configured as part of a multilink bundle.) Interface name for the multilink bundle.	<b>detail extensive none</b>
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table inet.0.	<b>detail extensive</b>
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the "Addresses Flags" section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive none</b>
<b>Local</b>	IP address of the logical interface.	<b>detail extensive none</b>
<b>Broadcast</b>	Broadcast address.	<b>detail extensive none</b>
<b>DLCI</b>	(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b> , <b>Total down time</b> , <b>Last down</b> , and <b>Traffic statistics</b> . <b>Flags</b> is one or more of the following: <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when the link is active, but no information is received from the DCE.</li> <li>• <b>Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>Dce-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive none</b>
<b>DLCI statistics</b>	(Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive none</b>

## 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:
  PLL Lock          Seconds      Count  State
  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 OC48 IQ and IQE)

<b>Syntax</b>	<code>show interfaces coc48-fpc/pic/port:channel</code> <brief   detail   extensive   terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics>
<b>Release Information</b>	Command introduced before Junos OS Release 12.3.
<b>Description</b>	Display status information about the specified channelized OC48 interface.
<b>Options</b>	<p><code>coc48-fpc/pic/port:channel</code>—Display standard information about the specified channelized OC48 interface as shown in the sample output.</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>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (Channelized OC48 IQ) on page 123</a>
<b>Output Fields</b>	See the output field table for the <a href="#">show interfaces (Channelized OC3 IQ and IQE)</a> command.

## Sample Output

### show interfaces extensive (Channelized OC48 IQ)

```

user@host> show interfaces coc48-4/1/0 extensive
Physical interface: coc48-4/1/0, Enabled, Physical link is Up
  Interface index: 138, SNMP ifIndex: 550, Generation: 141
  Link-level type: Controller, Clocking: Internal, SONET mode, Speed: OC48,
Loopback: None, Parent: None
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : None
  Hold-times    : Up 0 ms, Down 0 ms
  CoS queues    : 8 supported, 8 maximum usable queues
  Last flapped  : 2012-07-10 01:55:53 PDT (00:50:07 ago)
  Statistics last cleared: Never
  Interface preservation: disabled
  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		
Received SONET overhead:			
F1	: 0x00, J0	: 0x01, K1	: 0x00, K2 : 0x00
S1	: 0x00		
Transmitted SONET overhead:			
F1	: 0x00, J0	: 0x01, K1	: 0x00, K2 : 0x00
S1	: 0x00		

## show interfaces (Channelized STM1 IQ)

<b>Syntax</b>	<code>show interfaces (<i>type-fpc/pic/port</i> &lt;:<i>channel</i>&gt;&lt;:<i>channel</i>&gt;)</code> <code>&lt;brief   detail   extensive   terse&gt;</code> <code>&lt;descriptions&gt;</code> <code>&lt;media&gt;</code> <code>&lt;snmp-index <i>snmp-index</i>&gt;</code> <code>&lt;statistics&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized STM1 IQ interface.
<b>Options</b>	<p><b><i>type-fpc/pic/port:channel:channel</i></b>—Interface type with optional corresponding channel levels. The interface type can be one of the following types:</p> <ul style="list-style-type: none"> <li>• <b><i>type-fpc/pic/port:channel</i></b>—For the physical channelized STM1 IQ interface, <b><i>type</i></b> is <b>cstm1</b>. For the clear channel, <b><i>type</i></b> is <b>so</b>. For channelization, the STM1 IQ interface must be converted to interface type <b>cau4</b>.</li> <li>• <b><i>type-fpc/pic/port:channel</i></b>—At the first level of channelization, <b><i>type</i></b> can be <b>ce1</b> or <b>e1</b> ( clear channel or fractional channel from <b>cau4</b>).</li> <li>• <b><i>type-fpc/pic/port:channel:channel</i></b>—At the second level of channelization, <b><i>type</i></b> is <b>ds</b> (from <b>ce1</b>).</li> </ul> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index <i>snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces (Channelized STM1 IQ) (Physical) on page 125</a> <a href="#">show interfaces (Channelized AU-4) (Physical) on page 126</a> <a href="#">show interfaces (Channelized E1) (Physical) on page 126</a> <a href="#">show interfaces (DS) on page 127</a>
<b>Output Fields</b>	See the output field table for the <a href="#">show interfaces (Channelized STM1)</a> 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)

<b>Syntax</b>	<pre>show interfaces e1-fpc/pic/port:e1channel &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index snmp-index&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized STM1 interface.
<b>Options</b>	<p><b>e1-fpc/pic/port:e1channel</b>—Display standard status information about the specified channelized STM1 interface.</p> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index snmp-index</b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (Channelized STM1, SDH) on page 139</a>
<b>Output Fields</b>	<a href="#">Table 7 on page 128</a> lists the output fields for the <b>show interfaces</b> (all Channelized STM1 interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 7: Channelized STM1 show interfaces Output Fields

Field Name	Field Description	Level of Output
<b>Physical Interface</b>		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the "Enabled Field" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	Reference clock source. It can be <b>Internal</b> or <b>External</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Framing</b>	Physical layer framing format used on the link. It can be <b>G704</b> , <b>G704-NO-CRC4</b> , or <b>Unframed</b> . The default is <b>G704</b> .	All levels
<b>Parent</b>	(Channelized STM1 IQ interfaces only) Name and interface index of the interface to which a particular child interface belongs. <b>None</b> indicates that this interface is the top level.	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the "Device Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the "Link Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>
<b>Keepalive settings</b>	(PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> <li><b>intervalseconds</b>—The time in seconds between successive keepalive requests. The range is <b>10</b> seconds through <b>32,767</b> seconds, with a default of <b>10</b> seconds.</li> <li><b>down-count number</b>—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is <b>1</b> through <b>255</b>, with a default of <b>3</b>.</li> <li><b>up-count number</b>—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is <b>1</b> through <b>255</b>, with a default of <b>1</b>.</li> </ul>	<b>detail extensive none</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Keepalive statistics</b>	<p>(PPP and HDLC) Information about keepalive packets.</p> <ul style="list-style-type: none"> <li><b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li><b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>.</li> </ul> </li> <li><b>Output</b>—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"> <li><b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>.</li> </ul> </li> </ul>	<b>detail extensive none</b>
<b>ANSI LMI settings or ITU LMI settings</b>	<p>(Frame Relay) Local Management Interface settings. The format is <b>(ANSI or ITU) LMI settings: value, value...xx</b> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li><b>n391dte</b>—DTE full status polling interval (1- 255)</li> <li><b>n392dce</b>—DCE error threshold (1-10)</li> <li><b>n392dte</b>—DTE error threshold (1-10)</li> <li><b>n393dce</b>—DCE monitored event count (1-10)</li> <li><b>n393dte</b>—DTE monitored event count (1-10)</li> <li><b>t391dte</b>—DTE polling timer (5-30 seconds)</li> <li><b>t392dce</b>—DCE polling verification timer (5-30 seconds)</li> </ul>	<b>detail extensive none</b>
<b>LMI</b>	<p>(Frame Relay) Statistics about the link management.</p> <ul style="list-style-type: none"> <li><b>Input</b>—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 <b>Input: nn (last seen hh:mm:ss ago)</b>.</li> <li><b>Output</b>—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 <b>Output: nn (last seen hh:mm:ss ago)</b>.</li> </ul>	<b>detail extensive none</b>
<b>DTE statistics</b>	<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"> <li><b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li><b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li><b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li><b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	<b>detail extensive none</b>
<b>DCE statistics</b>	<p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> <li><b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li><b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li><b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li><b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	<b>detail extensive none</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Common statistics</b>	<p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> <li>• <b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li>• <b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li>• <b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li>• <b>Keepalive responses timedout</b>—Number of keepalive responses that timed out when no LMI packet was reported for <b>n392dte</b> or <b>n393dce</b> intervals. (See <b>LMI settings</b>.)</li> </ul>	<b>detail extensive none</b>
<b>Nonmatching DCE-end DLCIs</b>	<p>(Frame Relay, displayed only from the DTE) Number of DLCIs configured from the DCE.</p>	<b>detail extensive none</b>
<b>LCP state</b>	<p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—LCP is not configured on the interface.</li> <li>• <b>Opened</b>—LCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>NCP state</b>	<p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—NCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—NCP is not configured on the interface.</li> <li>• <b>Opened</b>—NCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>CHAP state</b>	<p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> <li>• <b>Chap-Chal-received</b>—Challenge was received but response not yet sent.</li> <li>• <b>Chap-Chal-sent</b>—Challenge was sent.</li> <li>• <b>Chap-Resp-received</b>—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.)</li> <li>• <b>Chap-Resp-sent</b>—Response was sent for the challenge received.</li> <li>• <b>Closed</b>—CHAP authentication is incomplete.</li> <li>• <b>Failure</b>—CHAP authentication failed.</li> <li>• <b>Not-configured</b>—CHAP is not configured on the interface.</li> <li>• <b>Success</b>—CHAP authentication was successful.</li> </ul>	<b>detail extensive none</b>
<b>Last flapped</b>	<p>Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</b>. For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b>.</p>	<b>detail extensive none</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>
<b>Traffic statistics</b>	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Input errors</b>	<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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Number of times the software did not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>SRAM errors</b>—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.</li> </ul>	<b>extensive</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> </ul>	<b>extensive</b>
<b>DS1 alarms</b> <b>DS1 defects</b>	<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"> <li>• <b>LOS</b>—Loss of signal.</li> <li>• <b>LOF</b>—Loss of frame.</li> <li>• <b>AIS</b>—Alarm indication signal.</li> <li>• <b>YLW</b>—Yellow alarm. Indicates errors at the remote site receiver.</li> </ul>	<b>detail extensive none</b>
<b>SDH alarms</b> <b>SDH defects</b>	<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><b>NOTE:</b> For controller-based SONET PICs, the SDH alarms and SDH defects output in the <b>show interface cstm1 extensive</b> command output only shows the section and line level defects. The path level defects can be found under the SONET (so) interface output.</p>	<b>All levels</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>E1 media</b>	<p>Active alarms and defects, plus counts of specific E1 errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Error types can be:</p> <ul style="list-style-type: none"> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>BEE</b>—Bit error</li> <li>• <b>BES</b>—Bit error seconds</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>CS</b>—Carrier state</li> <li>• <b>ES</b>—Errored seconds</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>FEBE</b>—Far-end block error</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>SEFS-S</b>—Severely errored framing seconds (section)</li> <li>• <b>SES</b>—Severely errored seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> </ul>	<b>extensive</b>
<b>Interface transmit queues</b>	<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"> <li>• <b>B/W</b>—Queue bandwidth as a percentage of the total interface bandwidth.</li> <li>• <b>WRR</b>—Weighted round-robin (in percent).</li> <li>• <b>Packets</b>—Number of packets transmitted.</li> <li>• <b>Bytes</b>—Number of bytes transmitted.</li> <li>• <b>Drops</b>—Number of packets dropped.</li> <li>• <b>Errors</b>—Number of packet errors.</li> </ul>	<b>extensive</b>
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Timeslots</b>—Configured time slots for the interface.</li> <li>• <b>Line encoding</b>—Line encoding used. It is always <b>HDB3</b>.</li> </ul>	<b>extensive</b>



Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>DS1 BERT configuration</b>	<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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	<b>detail extensive none</b>
<b>SDH PHY</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>PLL Lock</b>—Phase-locked loop</li> <li>• <b>PHY Light</b>—Loss of optical signal</li> </ul>	<b>extensive</b>
<b>SDH regenerator section</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>RS-BIP8</b>—24-bit BIP for multiplex section overhead (B2 bytes)</li> <li>• <b>OOF</b>—Out of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>RS-ES</b>—Errored seconds (near-end regenerator section)</li> <li>• <b>RS-SES</b>—Severely errored seconds (near-end regenerator section)</li> <li>• <b>RS-SEFS</b>—Severely errored framing seconds (regenerator section)</li> </ul>	<b>extensive</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SDH multiplex section</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>MS-BIP24</b>—8-bit BIP for high-order path overhead (B3 byte)</li> <li>• <b>MS-FEBE</b>—Far-end block error (multiplex section)</li> <li>• <b>MS-FERF</b>—Far-end remote fail (multiplex section)</li> <li>• <b>MS-AIS</b>—alarm indication signal (multiplex section)</li> <li>• <b>BERR-SF</b>—Bit error rate fault (signal failure)</li> <li>• <b>BERR-SD</b>—Bit error rate defect (signal degradation)</li> <li>• <b>MS-ES</b>—Errored seconds (near-end multiplex section)</li> <li>• <b>MS-SES</b>—Severely errored seconds (near-end multiplex section)</li> <li>• <b>MS-UAS</b>—Unavailable seconds (near-end multiplex section)</li> <li>• <b>MS-ES-FE</b>—Errored seconds (far-end multiplex section)</li> <li>• <b>MS-SES-FE</b>—Severely errored seconds (far-end multiplex section)</li> <li>• <b>MS-UAS-FE</b>—Unavailable seconds (far-end multiplex section)</li> </ul>	<b>extensive</b>
<b>SDH path</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>HP-BIP8</b>—8-bit BIP for regenerator section overhead (B1 byte)</li> <li>• <b>HP-FEBE</b>—Far-end block error (high-order path)</li> <li>• <b>HP-LOP</b>—Loss of pointer (high-order path)</li> <li>• <b>HP-AIS</b>—High-order-path alarm indication signal</li> <li>• <b>HP-FERF</b>—Far-end remote fail (high-order path)</li> <li>• <b>HP-UNEQ</b>—Unequipped (high-order path)</li> <li>• <b>HP-PLM</b>—Payload label mismatch (high-order path)</li> <li>• <b>HP-ES</b>—Errored seconds (near-end high-order path)</li> <li>• <b>HP-SES</b>—Severely errored seconds (near-end high-order path)</li> <li>• <b>HP-UAS</b>—Unavailable seconds (near-end high-order path)</li> <li>• <b>HP-ES-FE</b>—Errored seconds (far-end high-order path)</li> <li>• <b>HP-SES-FE</b>—Severely errored seconds (far-end high-order path)</li> <li>• <b>HP-UAS-FE</b>—Unavailable seconds (far-end high-order path)</li> </ul>	<b>extensive</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SDH tu</b>	<p>Active alarms and defects, plus counts of specific SDH tributary unit (TU) errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>TU-BIP-2</b>—Bit interleaved parity for SONET line overhead</li> <li>• <b>TU-FEBE</b>—(near-end TU)</li> <li>• <b>TU-LOP</b>—Loss of pointer (near-end TU)</li> <li>• <b>TU-AIS</b>—Alarm indication signal (near-end TU)</li> <li>• <b>TU-FERF</b>—(near-end TU)</li> <li>• <b>TU-UNEQ</b>—Unequipped (near-end TU)</li> <li>• <b>TU-PLM</b>—Payload label mismatch (near-end TU)</li> <li>• <b>TU-ES</b>—Errored seconds (near-end TU)</li> <li>• <b>TU-SES</b>—Severely errored seconds (near-end TU)</li> <li>• <b>TU-UAS</b>—Unavailable seconds (near-end TU)</li> <li>• <b>TU-ES-FE</b>—Errored seconds (far-end TU)</li> <li>• <b>TU-SES-FE</b>—Severely errored seconds (far-end TU)</li> <li>• <b>TU-UAS-FE</b>—Unavailable seconds (far-end TU)</li> </ul>	<b>extensive</b>
<b>Received SDH overhead</b>  <b>Transmitted SDH overhead</b>	<p>Values of the received and transmitted SONET overhead:</p> <ul style="list-style-type: none"> <li>• <b>C2</b>—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P.</li> <li>• <b>F1</b>—Section user channel byte. This byte is set aside for the purposes of users.</li> <li>• <b>K1 and K2</b>—These bytes are allocated for APS signaling for the protection of the multiplex section.</li> <li>• <b>J0</b>—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.</li> <li>• <b>S1</b>—Synchronization status. The S1 byte is located in the first STS-1 of an STS-<i>N</i> signal.</li> <li>• <b>Z3 and Z4</b>—Allocated for future use.</li> </ul>	<b>extensive</b>
<b>Received path trace</b>  <b>Transmitted path trace</b>	<p>Channelized OC12 interfaces allow path trace bytes to be sent inband across the SONET/SDH link. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits. This information is specific to each of the 12 channelized OC12 interfaces.</p>	<b>extensive</b>
<b>Packet Forwarding Engine configuration</b>	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>CoS information</b>	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Flags</b>	Information about the logical interface. Possible values are described in the “Logical Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , or <b>mpls</b> .	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table <b>inet.0</b> .	<b>detail extensive</b>
<b>Flags</b>	Information about the protocol family flags. Possible values are described in the “Family Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive none</b>

Table 7: Channelized STM1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Local</b>	IP address of the logical interface.	<b>detail extensive none</b>
<b>Broadcast</b>	Broadcast address.	<b>detail extensive none</b>
<b>DLCI</b>	(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b> , <b>Total down time</b> , <b>Last down</b> , and <b>Traffic statistics</b> . <b>Flags</b> is one or more of the following: <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when the link is active, but no information is received from the DCE.</li> <li>• <b>Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>Dce-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive none</b>
<b>DLCI statistics</b>	(Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive none</b>

## 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)

<b>Syntax</b>	show interfaces (ct1-fpc/pic/port   type-fpc/pic/port<:channel><:channel>) <brief   detail   extensive   terse> <descriptions> <media> <snmp-index <i>snmp-index</i> > <statistics>
<b>Release Information</b>	Command introduced in Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized T1 IQ interface.
<b>Options</b>	<p><b>type-fpc/pic/port:channel</b>—Interface type. With optional corresponding channel levels, the interface type can be one of the following:</p> <ul style="list-style-type: none"> <li><b>type-fpc/pic/port</b>—For the physical channelized T1 IQ interface, <b>type</b> is <b>ct1</b>.</li> <li><b>type-fpc/pic/port:channel</b>—For the clear channel, <b>type</b> is <b>t1</b>. At the first level of channelization, <b>type</b> can be <b>ct1</b> or <b>t1</b>.</li> <li><b>type-fpc/pic/port:channel:channel</b>—At the second level of channelization, <b>type</b> can be <b>ds</b>.</li> </ul> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index <i>snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show interfaces extensive (CT1) on page 151</a> <a href="#">show interfaces extensive (T1) on page 152</a> <a href="#">show interfaces extensive (DS0) on page 153</a>
<b>Output Fields</b>	Table 8 on page 143 lists the output fields for the <b>show interfaces</b> (Channelized T1 IQ and T3 IQ interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 8: 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 8: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Enabled</b>	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive</b> none
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive</b> none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	Reference clock source. It can be <b>Internal</b> or <b>External</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Framing</b>	Physical layer framing format used on the link. It can be <b>ESF</b> or <b>SF</b> . The default is <b>ESF</b> .	All levels
<b>Parent</b>	Name and interface index of the interface to which a particular child interface belongs. <b>None</b> indicates that this interface is the top level.	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the “Device Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>
<b>Keepalive settings</b>	Configured settings for keepalives. <ul style="list-style-type: none"> <li><b>interval seconds</b>—The time in seconds between successive keepalive requests. The range is <b>10</b> seconds through <b>32,767</b> seconds, with a default of <b>10</b> seconds.</li> <li><b>down-count number</b>—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is <b>1</b> through <b>255</b>, with a default of <b>3</b>.</li> <li><b>up-count number</b>—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is <b>1</b> through <b>255</b>, with a default of <b>1</b>.</li> </ul>	<b>detail extensive</b> none

Table 8: 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"> <li><b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li><b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>.</li> </ul> </li> <li><b>Output</b>—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"> <li><b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>.</li> </ul> </li> </ul>	detail extensive none
LMI settings	<p>(Frame Relay) Settings for Local Management Interface (LMI) can be either <b>ANSI LMI settings</b> or <b>ITU LMI settings</b>. ANSI LMI settings is the default. The format is (ANSI or ITU) <b>LMI settings: value, value... xx seconds</b>, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li><b>n391dte</b>—DTE full status polling interval (1–255)</li> <li><b>n392dce</b>—DCE error threshold (1–10)</li> <li><b>n392dte</b>—DTE error threshold (1–10)</li> <li><b>n393dce</b>—DCE monitored event count (1–10)</li> <li><b>n393dte</b>—DTE monitored event count (1–10)</li> <li><b>t391dte</b>—DTE polling timer (5–30 seconds)</li> <li><b>t392dce</b>—DCE polling verification timer (5–30 seconds)</li> </ul>	detail extensive none
LMI	<p>(Frame Relay) LMI packet statistics:</p> <ul style="list-style-type: none"> <li><b>Input</b>—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 <b>Input: nn (last seen hh:mm:ss ago)</b>.</li> <li><b>Output</b>—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 <b>Output: nn (last sent hh:mm:ss ago)</b>.</li> </ul>	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"> <li><b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li><b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li><b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li><b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	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"> <li><b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li><b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li><b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li><b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	detail extensive none

Table 8: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Common statistics</b>	<p>(Frame Relay) Statistics about messages sent between the DTE and the DCE:</p> <ul style="list-style-type: none"> <li>• <b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li>• <b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li>• <b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li>• <b>Keepalive responses timedout</b>—Number of keepalive responses that timed out when no LMI packet was reported for <b>n392dte</b> or <b>n393dce</b> intervals. (See <b>LMI settings</b>.)</li> </ul>	<b>detail extensive none</b>
<b>Nonmatching DCE-end DLCIs</b>	(Frame Relay) Number of DLCIs configured from the DCE, displayed only from the DTE.	<b>detail extensive none</b>
<b>LCP state</b>	<p>(PPP) Link Control Protocol state.</p> <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—LCP is not configured on the interface.</li> <li>• <b>Opened</b>—LCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>NCP state</b>	<p>(PPP) Network Control Protocol state.</p> <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—NCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—NCP is not configured on the interface.</li> <li>• <b>Opened</b>—NCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>CHAP state</b>	<p>(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction.</p> <ul style="list-style-type: none"> <li>• <b>Chap-Chal-received</b>—Challenge was received but response not yet sent.</li> <li>• <b>Chap-Chal-sent</b>—Challenge was sent.</li> <li>• <b>Chap-Resp-received</b>—Response was received for the challenge sent, but CHAP has not yet moved into the <b>Success</b> state. (Most likely with RADIUS authentication.)</li> <li>• <b>Chap-Resp-sent</b>—Response was sent for the challenge received.</li> <li>• <b>Closed</b>—CHAP authentication is incomplete.</li> <li>• <b>Failure</b>—CHAP authentication failed.</li> <li>• <b>Not-configured</b>—CHAP is not configured on the interface.</li> <li>• <b>Success</b>—CHAP authentication was successful.</li> </ul>	<b>detail extensive none</b>
<b>Last flapped</b>	Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>

Table 8: 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"> <li>• <b>Input bytes, Output bytes</b>—Number of bytes received and transmitted on the interface.</li> <li>• <b>Input packets, Output packets</b>—Number of packets received and transmitted on the interface.</li> </ul>	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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Giants</b>—Number of frames received that are larger than the giant threshold.</li> <li>• <b>Runts</b>—Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Counter increments when the software could not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Count of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Count of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>SRAM errors</b>—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.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	extensive

Table 8: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> <li>• <b>MTU errors</b>—Number of packets whose size exceeds the MTU of the interface.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>Queue counters</b>	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> <li>• <b>Queued packets</b>—Number of queued packets.</li> <li>• <b>Transmitted packets</b>—Number of transmitted packets.</li> <li>• <b>Dropped packets</b>—Number of packets dropped by the ASIC's RED mechanism.</li> </ul>	<b>detail extensive</b>
<b>DS1 alarms DS1 defects</b>	<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"> <li>• <b>LOS</b>—Loss of signal.</li> <li>• <b>LOF</b>—Loss of frame.</li> <li>• <b>AIS</b>—Alarm indication signal.</li> <li>• <b>YLW</b>—Yellow alarm. Indicates errors at the remote site receiver.</li> </ul>	<b>detail extensive none</b>

Table 8: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>T1 media</b>	<p>Counts of T1 media-specific errors.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>The T1 media-specific error types can be:</p> <ul style="list-style-type: none"> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>BEE</b>—Bit error event</li> <li>• <b>BES</b>—Bit error seconds</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>CS</b>—Carrier state</li> <li>• <b>ES</b>—Errored seconds</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>FEBE</b>—Far-end block error</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>SEFS</b>—Severely errored framing seconds (section)</li> <li>• <b>SES</b>—Severely errored seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> </ul>	<b>extensive</b>
<b>Line encoding</b>	Line encoding used: <b>B8ZS</b> or <b>AMI</b> .	All levels
<b>Buildout</b>	Buildout setting.	All levels
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Policing bucket</b>—Configured state of the receiving policer.</li> <li>• <b>Shaping bucket</b>—Configured state of the transmitting shaper.</li> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Timeslots</b>—Configured time slots for the interface.</li> <li>• <b>Line encoding</b>—Line encoding used: <b>B8ZS</b> or <b>AMI</b>.</li> <li>• <b>Byte encoding</b>—Byte encoding used: <b>Nx64K</b> or <b>Nx56K</b>.</li> <li>• <b>Data inversion</b>—HDLC data inversion setting: <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Idle cycle Flag</b>—Idle cycle flags.</li> <li>• <b>Start end Flag</b>—Start and end flag.</li> </ul>	<b>extensive</b>

Table 8: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>DSO or DS1 BERT configuration</b>	<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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	<b>detail extensive none</b>
<b>Packet Forwarding Engine configuration</b>	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Flags</b>	Information about the logical interface; values are described in the “Logical Interface Flags” section under <i>Common Output Fields Description</i> .	<b>All levels</b>
<b>Encapsulation</b>	Encapsulation on the logical interface.	<b>All levels</b>
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , or <b>mpls</b> .	<b>detail extensive none</b>
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table <b>inet.0</b> .	<b>detail extensive</b>
<b>Flags</b>	Information about the protocol family flags. Possible values are described in the “Family Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive none</b>
<b>Local</b>	IP address of the logical interface.	<b>detail extensive none</b>
<b>Broadcast</b>	Broadcast address.	<b>detail extensive none</b>



Table 8: Channelized T1 IQ and T3 IQ show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>DLCI</b>	<p>(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b>, <b>Total down time</b>, <b>Last down</b>, and <b>Traffic statistics</b>. <b>Flags</b> is one or more of the following:</p> <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when the link is active, but no information is received from the DCE.</li> <li>• <b>Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>Dce-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive none</b>
<b>DLCI statistics</b>	<p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive none</b>

## 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)

<b>Syntax</b>	<pre>show interfaces (ct3-fpc/pic/port   type-fpc/pic/port&lt;:channel&gt;&lt;:channel&gt;) &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index snmp-index&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified channelized T3 IQ interface.
<b>Options</b>	<p><b>type-fpc/pic/port:channel</b>—Interface type. With optional corresponding channel levels, the interface type can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>type-fpc/pic/port</b>—For the physical channelized T3 IQ interface, <b>type</b> is <b>ct3</b>.</li> <li>• <b>type-fpc/pic/port:channel</b>—For the clear channel, <b>type</b> is <b>t3</b>. At the first level of channelization, <b>type</b> can be <b>ct1</b> or <b>t1</b>.</li> <li>• <b>type-fpc/pic/port:channel:channel</b>—At the second level of channelization, <b>type</b> is <b>ds</b>.</li> </ul> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index snmp-index</b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<p><a href="#">show interfaces extensive (Channelized T3 IQ) (Physical) on page 156</a></p> <p><a href="#">show interfaces extensive (Channelized T1 on Channelized T3 IQ) on page 156</a></p> <p><a href="#">show interfaces extensive (DSO on Channelized T3 IQ) on page 156</a></p>
<b>Output Fields</b>	See the output field table for the <a href="#">show interfaces (Channelized T1 IQ)</a> 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 (SONET/SDH)

<b>Syntax</b>	<pre>show interfaces <i>so-fpc/pic/port</i> &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index <i>snmp-index</i>&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M Series and T Series routers only) Display status information about the specified SONET/SDH interface.
<b>Options</b>	<p><b><i>so-fpc/pic/port</i></b>—Display standard information about the specified SONET/SDH interface.</p> <p><b><i>brief   detail   extensive   terse</i></b>—(Optional) Display the specified level of output.</p> <p><b><i>descriptions</i></b>—(Optional) Display interface description strings.</p> <p><b><i>media</i></b>—(Optional) Display media-specific information about network interfaces.</p> <p><b><i>snmp-index snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b><i>statistics</i></b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>SONET/SDH Interfaces Overview</i></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show interfaces (SDH Mode, PPP) on page 170</a></p> <p><a href="#">show interfaces brief (SDH Mode, PPP) on page 171</a></p> <p><a href="#">show interfaces detail (SDH Mode, PPP) on page 171</a></p> <p><a href="#">show interfaces extensive (SDH Mode, PPP) on page 172</a></p> <p><a href="#">show interfaces brief (SONET Mode, Frame Relay) on page 174</a></p> <p><a href="#">show interfaces (SONET Mode, Frame Relay) on page 174</a></p> <p><a href="#">show interfaces detail (SONET Mode, Frame Relay) on page 175</a></p> <p><a href="#">show interfaces extensive (SONET Mode, Frame Relay) on page 177</a></p> <p><a href="#">show interfaces extensive (OC768-over-4xOC192 Mode) on page 179</a></p> <p><a href="#">show interfaces detail (IPv6 Tracking) on page 182</a></p> <p><a href="#">show interfaces (shared interface) on page 183</a></p>
<b>Output Fields</b>	<p><a href="#">Table 9 on page 158</a> lists the output fields for the <b>show interfaces (SONET/SDH)</b> command. Output fields are listed in the approximate order in which they appear.</p>

Table 9: SONET/SDH show interfaces Output Fields

Field Name	Field Description	Level of Output
<b>Physical Interface</b>		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive</b> none
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive</b> none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	SONET/SDH reference clock source: <b>Internal</b> or <b>External</b> . Clocking is configured and displayed only for channel 0.	All levels
<b>Framing mode</b>	Framing mode: <b>SONET</b> or <b>SDH</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Payload scrambler</b>	Whether payload scrambling is enabled.	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the “Device Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Shared-interface</b>	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 <b>Owner</b> . If the routing domain is a Protected System Domain (PSD) under the RSD, the value is <b>Non-owner</b> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels



Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>ANSI or ITU LMI settings</b>	<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"> <li>• <b>n391dte</b>—DTE full status polling interval (1-255)</li> <li>• <b>n392dce</b>—DCE error threshold (1-10)</li> <li>• <b>n392dte</b>—DTE error threshold (1-10)</li> <li>• <b>n393dce</b>—DCE monitored event count (1-10)</li> <li>• <b>n393dte</b>—DTE monitored event count (1-10)</li> <li>• <b>t391dte</b>—DTE polling timer (5-30 seconds)</li> <li>• <b>t392dce</b>—DCE polling verification timer (5-30 seconds)</li> </ul>	All levels
<b>LMI</b>	Input: <i>value</i> ( <i>hh:mm:ss ago</i> ), Output: <i>value</i> ( <i>hh:mm:ss ago</i> )	<b>brief</b> none
<b>LMI statistics</b>	<p>(Frame Relay) LMI packet statistics:</p> <ul style="list-style-type: none"> <li>• <b>Input</b>—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 <b>Input: <i>nn</i> (last seen <i>hh:mm:ss ago</i>)</b>.</li> <li>• <b>Output</b>—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 <b>Output: <i>nn</i> (last sent <i>hh:mm:ss ago</i>)</b>.</li> </ul>	<b>detail</b> extensive
<b>DTE statistics</b>	<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"> <li>• <b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li>• <b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li>• <b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li>• <b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	<b>detail</b> extensive none
<b>DCE statistics</b>	<p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> <li>• <b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li>• <b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li>• <b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li>• <b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	<b>detail</b> extensive none

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Common statistics</b>	(Frame Relay) Statistics about messages sent between the DTE and the DCE: <ul style="list-style-type: none"> <li>• <b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li>• <b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li>• <b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li>• <b>Keepalive responses timedout</b>—Number of keepalive responses that timed out when no LMI packet was reported for <b>n392dte</b> or <b>n393dce</b> intervals. (See <b>LMI settings</b>.)</li> </ul>	<b>detail extensive none</b>
<b>Nonmatching DCE-end DLCIs</b>	(Frame Relay. Displayed only from the DTE) Number of DLCIs configured from the DCE.	<b>detail extensive</b>
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>
<b>Keepalive settings</b>	(PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> <li>• <b>interval seconds</b>—The time in seconds between successive keepalive requests. The range is <b>10</b> seconds through <b>32,767</b> seconds, with a default of <b>10</b> seconds.</li> <li>• <b>down-count number</b>—The number of keepalive packets a destination must fail to receive before the network takes a link down. The range is <b>1</b> through <b>255</b>, with a default of <b>3</b>.</li> <li>• <b>up-count number</b>—The number of keepalive packets a destination must receive to change a link's status from down to up. The range is <b>1</b> through <b>255</b>, with a default of <b>1</b>.</li> </ul>	All levels
<b>Keepalive or Keepalive statistics</b>	(PPP and HDLC) Information about keepalive packets. <ul style="list-style-type: none"> <li>• <b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li>• <b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was received, in the format <b>hh:mm:ss</b>.</li> </ul> </li> <li>• <b>Output</b>—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"> <li>• <b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was sent, in the format <b>hh:mm:ss</b>.</li> </ul> </li> </ul>	All levels
<b>LCP state</b>	(PPP) Link Control Protocol state. <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—LCP is not configured on the interface.</li> <li>• <b>Opened</b>—LCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>NCP state</b>	(PPP) Network Control Protocol state. <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—NCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—NCP is not configured on the interface.</li> <li>• <b>Opened</b>—NCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>CHAP state</b>	(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction. <ul style="list-style-type: none"> <li>• <b>Chap-Chal-received</b>—Challenge was received but response not yet sent.</li> <li>• <b>Chap-Chal-sent</b>—Challenge was sent.</li> <li>• <b>Chap-Resp-received</b>—Response was received for the challenge sent, but CHAP has not yet moved into the <b>Success</b> state. (Most likely with RADIUS authentication.)</li> <li>• <b>Chap-Resp-sent</b>—Response was sent for the challenge received.</li> <li>• <b>Closed</b>—CHAP authentication is incomplete.</li> <li>• <b>Failure</b>—CHAP authentication failed.</li> <li>• <b>Not-configured</b>—CHAP is not configured on the interface.</li> <li>• <b>Success</b>—CHAP authentication was successful.</li> </ul>	<b>detail extensive none</b>
<b>CoS queues</b>	Number of CoS queues configured.	<b>detail extensive none</b>
<b>Last flapped</b>	Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>
<b>Input rate</b>	Input rate in bits per second (bps) and packets per second (pps).	None specified
<b>Output rate</b>	Output rate in bps and pps.	None specified
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>
<b>Traffic statistics</b>	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"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Label-switched interface (LSI) traffic statistics</b>	<p>(Frame Relay) LSI traffic statistics:</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes and speed, in bits per second (bps), received on the interface.</li> <li>• <b>Output packets</b>—Number of packets and speed, in bps, transmitted on the interface.</li> </ul>	<b>extensive</b>
<b>Input errors</b>	<p>Input errors on the interface whose definitions are as follows:</p> <ul style="list-style-type: none"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Runts</b>—Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Giants</b>—Number of frames received that are larger than the giant threshold.</li> <li>• <b>Bucket Drops</b>—Drops resulting from the traffic load exceeding the interface transmit/receive leaky bucket configuration. The default is <b>off</b>.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Number of times the software did not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>HS link FIFO overflows</b>—Number of FIFO overflows on the high-speed links between the ASICs responsible for handling the router interfaces.</li> </ul>	<b>extensive</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> <li>• <b>HS link FIFO underflows</b>—Number of FIFO underflows on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>MTU errors</b>—Number of packets whose size exceeds the MTU of the interface.</li> </ul>	<b>extensive</b>
<b>IPv6 transit statistics</b>	<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"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Egress queues</b>	Total number of egress queues supported on the specified interface.	<b>detail extensive</b>
<b>Queue counters</b>	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> <li>• <b>Queued packets</b>—Number of queued packets.</li> <li>• <b>Transmitted packets</b>—Number of transmitted packets.</li> <li>• <b>Dropped packets</b>—Number of packets dropped by the ASIC's RED mechanism.</li> </ul>	<b>extensive</b>
<b>SONET alarms</b> <b>SONET defects</b>	(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: <b>SONET PHY</b> , <b>SONET section</b> , <b>SONET line</b> , and <b>SONET path</b> .	All levels
<b>Link</b>	(For 4-port OC192c PIC operating in OC768-over-4xOC192 mode) The link number. Errors and alarms are displayed for each link.	<b>extensive</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

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

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SONET path</b>	<p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>BIP-B3</b>—Bit interleaved parity for SONET section overhead</li> <li>• <b>REI-P</b>—Remote error indication</li> <li>• <b>LOP-P</b>—Loss of pointer (path)</li> <li>• <b>AIS-P</b>—Path alarm indication signal</li> <li>• <b>RDI-P</b>—Path remote defect indication</li> <li>• <b>UNEQ-P</b>—Path unequipped</li> <li>• <b>PLM-P</b>—Path payload (signal) label mismatch</li> <li>• <b>ES-P</b>—Errored seconds (near-end STS path)</li> <li>• <b>SES-P</b>—Severely errored seconds (near-end STS path)</li> <li>• <b>UAS-P</b>—Unavailable seconds (near-end STS path)</li> <li>• <b>ES-PFE</b>—Errored seconds (far-end STS path)</li> <li>• <b>SES-PFE</b>—Severely errored seconds (far-end STS path)</li> <li>• <b>UAS-PFE</b>—Unavailable seconds (far-end STS path)</li> </ul>	<b>extensive</b>
<b>Received SONET overhead</b>  <b>Transmitted SONET overhead</b>	<p>Values of the received and transmitted SONET overhead:</p> <ul style="list-style-type: none"> <li>• <b>C2</b>—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P.</li> <li>• <b>F1</b>—Section user channel byte. This byte is set aside for the purposes of users.</li> <li>• <b>K1 and K2</b>—These bytes are allocated for APS signaling for the protection of the multiplex section.</li> <li>• <b>J0</b>—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.</li> <li>• <b>S1</b>—Synchronization status. The S1 byte is located in the first STS-1 of an STS-<i>N</i>.</li> <li>• <b>Z3 and Z4</b>—Allocated for future use.</li> </ul>	<b>extensive</b>
<b>SDH alarms</b>  <b>SDH defects</b>	<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: <b>SDH PHY</b>, <b>SDH regenerator section</b>, <b>SDH multiplex section</b>, and <b>SDH path</b>.</p>	All levels

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SDH PHY</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>PLL Lock</b>—Phase-locked loop</li> <li>• <b>PHY Light</b>—Loss of optical signal</li> </ul>	<b>extensive</b>
<b>SDH regenerator section</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>RS-BIP8</b>—24-bit BIP for multiplex section overhead (B2 bytes)</li> <li>• <b>OOF</b>—Out of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>RS-ES</b>—Errored seconds (near-end regenerator section)</li> <li>• <b>RS-SES</b>—Severely errored seconds (near-end regenerator section)</li> <li>• <b>RS-SEFS</b>—Severely errored framing seconds (regenerator section)</li> </ul>	<b>extensive</b>
<b>SDH multiplex section</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>MS-BIP24</b>—8-bit BIP for high-order path overhead (B3 byte)</li> <li>• <b>MS-FEBE</b>—Far-end block error (multiplex section)</li> <li>• <b>MS-FERF</b>—Far-end remote fail (multiplex section)</li> <li>• <b>MS-AIS</b>—Alarm indication signal (multiplex section)</li> <li>• <b>BERR-SF</b>—Bit error rate fault (signal failure)</li> <li>• <b>BERR-SD</b>—Bit error rate defect (signal degradation)</li> <li>• <b>MS-ES</b>—Errored seconds (near-end multiplex section)</li> <li>• <b>MS-SES</b>—Severely errored seconds (near-end multiplex section)</li> <li>• <b>MS-UAS</b>—Unavailable seconds (near-end multiplex section)</li> <li>• <b>MS-ES-FE</b>—Errored seconds (far-end multiplex section)</li> <li>• <b>MS-SES-FE</b>—Severely errored seconds (far-end multiplex section)</li> <li>• <b>MS-UAS-FE</b>—Unavailable seconds (far-end multiplex section)</li> </ul>	<b>extensive</b>



Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SDH path</b>	<p>Active alarms and defects, plus counts of specific SDH errors with detailed information.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem.</li> </ul> <p>Subfields are:</p> <ul style="list-style-type: none"> <li>• <b>HP-BIP8</b>—8-bit BIP for regenerator section overhead (B1 byte)</li> <li>• <b>HP-FEBE</b>—Far-end block error (high-order path)</li> <li>• <b>HP-LOP</b>—Loss of pointer (high-order path)</li> <li>• <b>HP-AIS</b>—High-order-path alarm indication signal</li> <li>• <b>HP-FERF</b>—Far-end remote fail (high-order path)</li> <li>• <b>HP-UNEQ</b>—Unequipped (high-order path)</li> <li>• <b>HP-PLM</b>—Payload label mismatch (high-order path)</li> <li>• <b>HP-ES</b>—Errored seconds (near-end high-order path)</li> <li>• <b>HP-SES</b>—Severely errored seconds (near-end high-order path)</li> <li>• <b>HP-UAS</b>—Unavailable seconds (near-end high-order path)</li> <li>• <b>HP-ES-FE</b>—Errored seconds (far-end high-order path)</li> <li>• <b>HP-SES-FE</b>—Severely errored seconds (far-end high-order path)</li> <li>• <b>HP-UAS-FE</b>—Unavailable seconds (far-end high-order path)</li> </ul>	<b>extensive</b>
<b>Received SDH overhead</b>  <b>Transmitted SDH overhead</b>	<p>Values of the received and transmitted SONET overhead:</p> <ul style="list-style-type: none"> <li>• <b>C2</b>—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P.</li> <li>• <b>F1</b>—Section user channel byte. This byte is set aside for the purposes of users.</li> <li>• <b>K1</b> and <b>K2</b>—These bytes are allocated for APS signaling for the protection of the multiplex section.</li> <li>• <b>J0</b>—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.</li> <li>• <b>S1</b>—Synchronization status. The S1 byte is located in the first STS-1 of an STS-<i>N</i>.</li> <li>• <b>Z3</b> and <b>Z4</b>—Allocated for future use.</li> </ul>	<b>extensive</b>
<b>Received path trace</b>  <b>Transmitted path trace</b>	<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>	<b>extensive</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>HDLC configuration</b>	Information about the HDLC configuration. <ul style="list-style-type: none"> <li>• <b>Policing bucket</b>—Configured state of the receiving policer.</li> <li>• <b>Shaping bucket</b>—Configured state of the transmitting shaper.</li> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> </ul>	<b>extensive</b>
<b>CoS information</b>	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	<b>extensive</b>
<b>Packet Forwarding Engine configuration</b>	Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Flags</b>	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>PPP parameters</b>	The PPP loopback clear timer value.	<b>extensive</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Shared interface</b>	Provides the following information: <ul style="list-style-type: none"> <li>• <b>shared with</b>—(RSD only) Indicates which PSD owns the logical shared interface. For example, <b>psd3</b>.</li> <li>• <b>peer interface</b>—(PSD only) Lists the logical tunnel interface that peers with the logical shared interface. For example, <b>ut-2/1/0.2</b>.</li> <li>• <b>tunnel token</b>—Specifies the receive (RX) and transmit (TX) tunnel tokens. For example, <b>Rx: 5.519, Tx: 13.514</b>.</li> </ul>	All levels
<b>Input packets</b>	Number of packets received on the logical interface.	None specified
<b>Output packets</b>	Number of packets transmitted on the logical interface.	None specified
<b>Traffic statistics</b>	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.	<b>detail extensive</b>
<b>Local statistics</b>	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.	<b>detail extensive</b>
<b>Transit statistics</b>	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.	<b>detail extensive</b>
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , or <b>mpls</b> .	<b>detail extensive none</b>
<b><i>protocol-family</i></b>	Protocol family configured on the logical interface. If the protocol is <b>inet</b> , the IP address of the interface is also displayed.	<b>brief</b>
<b>Multilink bundle</b>	(If the logical interface is configured as part of a multilink bundle.) Interface name for the multilink bundle.	<b>detail extensive none</b>
<b>AS bundle</b>	(If the logical interface is configured as part of an aggregated SONET bundle.) AS bundle number.	<b>detail extensive</b>
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table <b>inet.0</b> .	<b>detail extensive</b>
<b>Flags</b>	Information about the protocol family flags. Possible values are described in the “Family Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>

Table 9: SONET/SDH show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive none</b>
<b>Local</b>	IP address of the logical interface.	<b>detail extensive none</b>
<b>Broadcast</b>	Broadcast address of the interface.	<b>detail extensive none</b>
<b>DLCI</b>	(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b> , <b>Total down time</b> , <b>Last down</b> , and <b>Traffic statistics</b> . <b>Flags</b> is one or more of the following: <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when the link is active, but no information is received from the DCE.</li> <li>• <b>Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>Dce-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive</b>
<b>DLCI statistics</b>	(Frame Relay) Data-link connection identifier (DLCI) statistics. <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive none</b>

## 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, mpls:
Not-configured
CHAP state: Closed
CoS queues    : 4 supported, 4 maximum usable queues
Last flapped  : 2006-03-24 13:20:56 PST (00:05:09 ago)
Input rate    : 0 bps (0 pps)
Output rate   : 0 bps (0 pps)
SDH alarms    : None
SDH defects   : None

Logical interface so-0/0/0.0 (Index 66) (SNMP ifIndex 43)

```

```

Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
Protocol inet, MTU: 4470
  Flags: None
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.0.12.0/30, Local: 10.0.12.1, Broadcast: 10.0.12.3
Protocol iso, MTU: 4470
  Flags: Protocol-Down
Protocol mpls, MTU: 4458, Maximum labels: 3
  Flags: Protocol-Down, Is-Primary

```

### show interfaces brief (SDH Mode, PPP)

```

user@host> show interfaces so-0/0/0 brief
Physical interface: so-0/0/0, Enabled, Physical link is Up
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 25 (00:00:01 ago), Output: 24 (00:00:04 ago)
  SDH alarms    : None
  SDH defects   : None

Logical interface so-0/0/0.0
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP
  inet 10.0.12.1/30
  iso
  mpls

```

### show interfaces detail (SDH Mode, PPP)

```

user@host> show interfaces so-0/0/0 detail
Physical interface: so-0/0/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 66, Generation: 35
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Hold-times     : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 33 (last seen 00:00:05 ago)
    Output: 32 (last sent 00:00:06 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
  Not-configured
  CHAP state: Closed
  CoS queues   : 4 supported, 4 maximum usable queues
  Last flapped : 2006-03-24 13:20:56 PST (00:05:38 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes   :           862           0 bps
    Output bytes  :          3592          64 bps
    Input packets :           70           0 pps
    Output packets:          330           0 pps
  Egress queues: 4 supported, 4 in use
  Queue counters:

```

	Queued packets	Transmitted packets	Dropped packets
0 best-effort	0	0	0

1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	329	329	0

SDH alarms : None  
SDH defects : None

Logical interface so-0/0/0.0 (Index 66) (SNMP ifIndex 43) (Generation 19)  
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPP  
Protocol inet, MTU: 4470, Generation: 48, Route table: 0  
Flags: None  
Addresses, Flags: Is-Preferred Is-Primary  
Destination: 10.0.12.0/30, Local: 10.0.12.1, Broadcast: 10.0.12.3,  
Generation: 48  
Protocol iso, MTU: 4470, Generation: 49, Route table: 0  
Flags: Protocol-Down  
Protocol mpls, MTU: 4458, Maximum labels: 3, Generation: 50, Route table: 0  
Flags: Protocol-Down, Is-Primary

**show interfaces extensive (SDH Mode, PPP)**

```

user@host> show interfaces so-0/0/0 extensive
Physical interface: so-0/0/0, Enabled, Physical link is Up
  Interface index: 149, SNMP ifIndex: 66, Generation: 35
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SDH mode, Speed: OC3,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags      : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags       : Keepalives
  Hold-times       : Up 0 ms, Down 0 ms
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive statistics:
    Input : 36 (last seen 00:00:01 ago)
    Output: 35 (last sent 00:00:10 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
  Not-configured
  CHAP state: Closed
  CoS queues      : 4 supported, 4 maximum usable queues
  Last flapped    : 2006-03-24 13:20:56 PST (00:06:08 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :          922          0 bps
    Output bytes :        3850         64 bps
    Input packets:           75          0 pps
    Output packets:        356          0 pps
  Label-switched interface (LSI) traffic statistics:
    Input bytes :           0          0 bps
    Input packets:          0          0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Bucket drops: 0, Policed discards: 218, L3 incompletes: 0,
    L2 channel errors: 0, L2 mismatch timeouts: 2, HS link CRC errors: 0,
    HS link FIFO overflows: 0
  Output errors:
    Carrier transitions: 3, Errors: 0, Drops: 0, Aged packets: 0,
    HS link FIFO underflows: 0, MTU errors: 0
  Egress queues: 4 supported, 4 in use

```

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 best-effort	0	0	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	354	354	0

SDH alarms : None

SDH defects : None

SDH PHY:	Seconds	Count	State
PLL Lock	0	0	OK
PHY Light	2	1	OK

SDH regenerator section:

RS-BIP8	0	0	
OOF	3	8	OK
LOS	3	2	OK
LOF	3	2	OK
RS-ES	3		
RS-SES	3		
RS-SEFS	3		

SDH multiplex section:

MS-BIP24	0	0	
MS-FEBE	0	0	
MS-FERF	3	2	OK
MS-AIS	2	1	OK
BERR-SF	0	0	OK
BERR-SD	0	0	OK
MS-ES	3		
MS-SES	3		
MS-UAS	0		
MS-SES-FE	3		
MS-UAS-FE	0		

SDH path:

HP-BIP8	0	0	
HP-FEBE	0	0	
HP-LOP	1	1	OK
HP-AIS	2	1	OK
HP-FERF	3	2	OK
HP-UNEQ	0	0	OK
HP-PLM	1	1	OK
HP-ES	3		
HP-SES	3		
HP-UAS	0		
HP-ES-FE	3		
HP-SES-FE	3		
HP-UAS-FE	0		

Received SDH overhead:

F1	: 0x00, J0	: 0x00, K1	: 0x00, K2	: 0x00
S1	: 0x00, C2	: 0xcf, C2(cmp)	: 0xcf, F2	: 0x00
Z3	: 0x00, Z4	: 0x00, S1(cmp)	: 0x00	

Transmitted SDH overhead:

F1	: 0x00, J0	: 0x01, K1	: 0x00, K2	: 0x00
S1	: 0x00, C2	: 0xcf, F2	: 0x00, Z3	: 0x00
Z4	: 0x00			

Received path trace: R2 so-0/0/0

52 32 20 73 6f 2d 30 2f 30 2f 30 00 00 00 00 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, SONE 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 (T1, E1, or DS)

<b>Syntax</b>	<pre>show interfaces <i>interface-type</i> &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index <i>snmp-index</i>&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	Display status information about the specified T1, E1, or DS interface.
<b>Options</b>	<p><b><i>interface-type</i></b>—On ACX Series, M Series, MX Series, and T Series routers, the T1 interface type is <b>t1-<i>fpc/pic/port</i></b>, whereas the E1 interface type is <b>e1-<i>fpc/pic/port</i></b>, and DS interface type is <b>ds-<i>fpc/pic/port:channel</i></b>. On the J Series routers, the T1 interface type is <b>t1-<i>pim/O/port</i></b>, whereas the E1 interface type is <b>e1-<i>pim/O/port</i></b>.</p> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index <i>snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Understanding Interfaces on ACX Series Universal Access Routers</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show interfaces (T1, IMA Link) on page 197</a> <a href="#">show interfaces (T1, PPP) on page 198</a> <a href="#">show interfaces detail (T1, PPP) on page 198</a> <a href="#">show interfaces extensive (T1 CRC Errors) on page 199</a> <a href="#">show interfaces extensive (T1, PPP) on page 199</a> <a href="#">show interfaces (E1, Frame Relay) on page 201</a> <a href="#">show interfaces detail (E1, Frame Relay) on page 202</a> <a href="#">show interfaces extensive (E1, Frame Relay) on page 203</a> <a href="#">show interfaces (E1, IMA Link) on page 205</a> <a href="#">show interfaces extensive (T1, TDM-CCC-SATOP) on page 206</a> <a href="#">show interfaces extensive (DS, TDM-CCC-CESoPSN) on page 207</a>
<b>Output Fields</b>	<p><a href="#">Table 10 on page 186</a> lists the output fields for the <b>show interfaces</b> (T1 or E1) command. Output fields are listed in the approximate order in which they appear.</p>

Table 10: T1 or E1 show interfaces Output Fields

Field Name	Field Description	Level of Output
<b>Physical Interface</b>		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive</b> none
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive</b> none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	Reference clock source: <b>Internal</b> or <b>External</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Framing</b>	Physical layer framing format used for the E1 interface on the link: <b>G704</b> , <b>G704-NO-CRC4</b> , or <b>Unframed</b> . The default is <b>G704</b> .  Physical layer framing format used for the T1 interface on the link: <b>SF</b> and <b>ESF</b> . The default is <b>ESF</b> .	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the “Device Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>IMA Link alarms</b>	Current active IMA link alarms, including the following: <ul style="list-style-type: none"> <li>• LIF</li> <li>• LODS</li> <li>• RFI-IMA</li> <li>• Tx-Mis-Connected</li> <li>• Tx-Unusable-FE</li> <li>• Rx-Unusable-FE</li> <li>• Link Fault</li> </ul>	<b>detail extensive none</b>
<b>IMA Link defects</b>	Current active IMA link defects, including the following: <ul style="list-style-type: none"> <li>• LIF</li> <li>• LODS</li> <li>• RFI-IMA</li> <li>• Tx-Mis-Connected</li> <li>• Tx-Unusable-FE</li> <li>• Rx-Unusable-FE</li> <li>• Link Fault</li> </ul>	<b>detail extensive none</b>
<b>IMA Link state</b>	Current active IMA link status, including the following: <ul style="list-style-type: none"> <li>• <b>Line:</b> synchronized or not synchronized</li> <li>• <b>Near end:</b>—Status of near-end receive and transmit links <ul style="list-style-type: none"> <li>• <b>Rx:</b> Usable or Unusable</li> <li>• <b>Tx:</b> Usable or Unusable</li> </ul> </li> <li>• <b>Far end:</b>—Status of far-end receive and transmit links <ul style="list-style-type: none"> <li>• <b>Rx:</b> Usable or Unusable</li> <li>• <b>Tx:</b> Usable or Unusable</li> </ul> </li> </ul>	<b>detail extensive none</b>

Table 10: 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"> <li>• LIF</li> <li>• LODS</li> <li>• Err-ICP</li> <li>• IV</li> <li>• Rx-FC</li> <li>• Tx-FC</li> <li>• FE-Defects</li> <li>• FE-Rx-FC</li> <li>• FE-Tx-FC</li> <li>• Rx-ICP</li> <li>• Rx-Stuff</li> <li>• Tx-ICP</li> <li>• Tx-Stuff</li> <li>• Rx-SES</li> <li>• Rx-UAS</li> <li>• Rx-UUS</li> <li>• Tx-UUS</li> <li>• FE-Rx-SES</li> <li>• FE-Rx-UAS</li> <li>• FE-Rx-UUS</li> <li>• FE-Tx-UUS</li> </ul>	detail extensive none
Keepalive settings	<p>(PPP and HDLC) Configured settings for keepalives.</p> <ul style="list-style-type: none"> <li>• <b>interval seconds</b>—The time in seconds between successive keepalive requests. The range is 10 seconds through 32,767 seconds, with a default of 10 seconds.</li> <li>• <b>down-count number</b>—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.</li> <li>• <b>up-count number</b>—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.</li> </ul>	detail extensive none
Keepalive statistics	<p>(PPP and HDLC) Information about keepalive packets. (When no level of output is specified, the word <b>statistics</b> is not part of the field name and the <b>last seen</b> text is not displayed.)</p> <ul style="list-style-type: none"> <li>• <b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li>• (last seen 00:00:00 ago)—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>.</li> </ul> </li> <li>• <b>Output</b>—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"> <li>• (last seen 00:00:00 ago)—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>.</li> </ul> </li> </ul>	detail extensive none

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>LMI settings</b>	<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 <b>(ANSI or ITU) LMI settings: value, value... xx</b> seconds, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li>• <b>n391dte</b>—DTE full status polling interval (1–255)</li> <li>• <b>n392dce</b>—DCE error threshold (1–10)</li> <li>• <b>n392dte</b>—DTE error threshold (1–10)</li> <li>• <b>n393dce</b>—DCE monitored event count (1–10)</li> <li>• <b>n393dte</b>—DTE monitored event count (1–10)</li> <li>• <b>t391dte</b>—DTE polling timer (5–30 seconds)</li> <li>• <b>t392dce</b>—DCE polling verification timer (5–30 seconds)</li> </ul>	<b>detail extensive none</b>
<b>LMI</b>	<p>(Frame Relay) Local Management Interface (LMI) packet statistics:</p> <ul style="list-style-type: none"> <li>• <b>Input</b>—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 <b>Input: nn (last seen hh:mm:ss ago)</b>.</li> <li>• <b>Output</b>—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 <b>Output: nn (last sent hh:mm:ss ago)</b>.</li> </ul>	<b>detail extensive none</b>
<b>DTE statistics</b>	<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"> <li>• <b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li>• <b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li>• <b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li>• <b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	<b>detail extensive none</b>
<b>DCE statistics</b>	<p>(Frame Relay) Statistics about messages transmitted from the DCE to the DTE:</p> <ul style="list-style-type: none"> <li>• <b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li>• <b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li>• <b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li>• <b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	<b>detail extensive none</b>

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Common statistics</b>	(Frame Relay) Statistics about messages sent between the DTE and the DCE: <ul style="list-style-type: none"> <li>• <b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li>• <b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li>• <b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li>• <b>Keepalive responses timedout</b>—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 <b>LMI settings</b>.)</li> </ul>	<b>detail extensive none</b>
<b>Nonmatching DCE-end DLCIs</b>	(Frame Relay. Displayed only from the DTE.) Number of DLCIs configured from the DCE.	<b>detail extensive none</b>
<b>LCP state</b>	(PPP) Link Control Protocol state. <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not configured</b>—LCP is not configured on the interface.</li> <li>• <b>Opened</b>—LCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>NCP state</b>	(PPP) Network Control Protocol state. <ul style="list-style-type: none"> <li>• <b>Conf-ack-received</b>—Acknowledgement was received.</li> <li>• <b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li>• <b>Conf-req-sent</b>—Request was sent.</li> <li>• <b>Down</b>—NCP negotiation is incomplete (not yet completed or has failed).</li> <li>• <b>Not configured</b>—NCP is not configured on the interface.</li> <li>• <b>Opened</b>—NCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>CHAP state</b>	(PPP) State of the Challenge Handshake Authentication Protocol (CHAP) during its transaction. <ul style="list-style-type: none"> <li>• <b>Chap-Chal-received</b>—Challenge was received but response is not yet sent.</li> <li>• <b>Chap-Chal-sent</b>—Challenge was sent.</li> <li>• <b>Chap-Resp-received</b>—Response was received for the challenge sent, but CHAP has not yet moved into the Success state. (Most likely with RADIUS authentication.)</li> <li>• <b>Chap-Resp-sent</b>—Response was sent for the challenge received.</li> <li>• <b>Down</b>—CHAP authentication is incomplete (not yet completed or has failed).</li> <li>• <b>Not-configured</b>—CHAP is not configured on the interface.</li> <li>• <b>Opened</b>—CHAP authentication was successful.</li> </ul>	<b>detail extensive none</b>
<b>Last flapped</b>	Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: year-month-day hour:minute:second timezone (hour:minute:second ago)</b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>



Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>CoS Queues</b>	Number of CoS queues configured.	<b>detail extensive none</b>
<b>Input rate</b>	Input rate in bits per second (bps) and packets per second (pps).	None specified
<b>Output rate</b>	Output rate in bps and pps.	None specified
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>
<b>Traffic statistics</b>	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Input errors</b>	<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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Number of times the software did not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>SRAM errors</b>—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.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> <li>• <b>MTU errors</b>—Number of packets whose size exceeded the MTU of the interface.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>Queue counters</b>	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> <li>• <b>Queued packets</b>—Number of queued packets.</li> <li>• <b>Transmitted packets</b>—Number of transmitted packets.</li> <li>• <b>Dropped packets</b>—Number of packets dropped by the ASIC's RED mechanism.</li> </ul>	<b>detail extensive</b>
<b>DS1 alarms</b> <b>DS1 defects</b>	<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"> <li>• <b>AIS</b>—Alarm indication signal.</li> <li>• <b>LOF</b>—Loss of frame.</li> <li>• <b>LOS</b>—Loss of signal.</li> <li>• <b>YLW</b>—Yellow alarm. Indicates errors at the remote site receiver.</li> </ul>	<b>detail extensive none</b>

Table 10: 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"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than <b>OK</b> indicates a problem. The T1 or E1 media-specific error types are:</li> <li>• <b>SEF</b>—Severely errored framing</li> <li>• <b>BEE</b>—Bit error</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> <li>• <b>CRC Major</b>—Cyclic redundancy check major alarm threshold exceeded</li> <li>• <b>CRC Minor</b>—Cyclic redundancy check minor alarm threshold exceeded</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—Pulse code violation</li> <li>• <b>CS</b>—Carrier state</li> <li>• <b>CRC</b>—Cyclic redundancy check</li> <li>• <b>FEBE</b>—Far-end block error (E1 only)</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>ES</b>—Errored seconds</li> <li>• <b>BES</b>—Bursty errored seconds</li> <li>• <b>SES</b>—Severely errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	extensive
SAToP Configuration	<p>Information about the SAToP configuration.</p> <ul style="list-style-type: none"> <li>• <b>payload-size</b>—Configure the payload size, in bytes (from 32 through 1024 bytes).</li> <li>• <b>idle-pattern</b>—An 8-bit hexadecimal pattern to replace TDM data in a lost packet (from 0 through 255).</li> <li>• <b>jitter-buffer-packets</b>—Number of packets in the jitter buffer (from 1 through 64 packets).</li> <li>• <b>jitter-buffer-latency</b>—Time delay in the jitter buffer (from 1 through 1000 milliseconds).</li> <li>• <b>excessive-packet-loss-rate</b>—Set packet loss options. The options are <b>groups</b>, <b>sample-period</b>, and <b>threshold</b>.</li> <li>• <b>sample-period</b>—Time required to calculate excessive packet loss rate (from 1000 through 65,535 milliseconds).</li> <li>• <b>threshold</b>—Percentile designating the threshold of excessive packet loss rate (1–100 percent).</li> </ul>	extensive

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>CESoPSN Configuration</b>	<p>Information about the CESoPSN configuration.</p> <ul style="list-style-type: none"> <li>• <b>packetization-latency</b>—Time required to create packets (from 1000 through 8000 microseconds).</li> <li>• <b>idle-pattern</b>—An 8-bit hexadecimal pattern to replace TDM data in a lost packet (from 0 through 255).</li> <li>• <b>jitter-buffer-packets</b>—Number of packets in the jitter buffer (from 1 through 64 packets).</li> <li>• <b>jitter-buffer-latency</b>—Time delay in the jitter buffer (from 1 through 1000 milliseconds).</li> <li>• <b>excessive-packet-loss-rate</b>—Set packet loss options. The options are <b>sample-period</b> and <b>threshold</b>.</li> <li>• <b>sample-period</b>—Time required to calculate excessive packet loss rate (from 1000 through 65,535 milliseconds).</li> <li>• <b>threshold</b>—Percentile designating the threshold of excessive packet loss rate (1–100 percent).</li> </ul>	<b>extensive</b>
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Policing bucket</b>—Configured state of the receiving policer.</li> <li>• <b>Shaping bucket</b>—Configured state of the transmitting shaper.</li> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Timeslots</b>—Time slots configured on the interface.</li> <li>• <b>Buildout</b>—(T1 only) Buildout setting: 0-132, 133-265, 266-398, 399-531, or 532-655 feet.</li> <li>• <b>Timeslots</b>—Configured time slots for the interface.</li> <li>• <b>Byte encoding</b>—(T1 only) Byte encoding used: <b>Nx64K</b> or <b>Nx56K</b>.</li> <li>• <b>Line encoding</b>—Line encoding used. For T1, the value can be <b>B8ZS</b> or <b>AMI</b>. For E1, the value is <b>HDB3</b>.</li> <li>• <b>Data inversion</b>—HDLC data inversion setting: <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Idle cycle flag</b>—Idle cycle flags.</li> <li>• <b>Start end flag</b>—Start and end flag.</li> </ul>	<b>extensive</b>
<b>DS1 BERT configuration</b>	<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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	<b>detail extensive none</b>
<b>Packet Forwarding Engine configuration</b>	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	<b>extensive</b>

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>CoS information</b>	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	<b>extensive</b>
<b>Logical Interface</b>		
<b>Logical interface</b>	Name of the logical interface.	All levels
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Flags</b>	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Encapsulation</b>	Encapsulation on the logical interface.	All levels
<b>Input packets</b>	Number of packets received on the logical interface.	None specified
<b>Output packets</b>	Number of packets transmitted on the logical interface.	None specified
<b>Traffic statistics</b>	(Frame Relay) Number and rate of bytes and packets received and transmitted on the logical interface. <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Local statistics</b>	(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.	<b>detail extensive</b>

Table 10: T1 or E1 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Transit statistics</b>	(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.	<b>detail extensive</b>
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , <b>mlfr</b> , or <b>mpls</b> .	<b>detail extensive</b> none
<b>Multilink bundle</b>	Interface name for the multilink bundle, if configured.	<b>detail extensive</b> none
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive</b> none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, <b>0</b> refers to the routing table <b>inet.0</b> .	<b>detail extensive</b>
<b>Flags</b>	Information about the protocol family flags. Possible values are described in the “Family Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive</b> none
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive</b> none
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive</b> none
<b>Local</b>	IP address of the logical interface.	<b>detail extensive</b> none
<b>Broadcast</b>	Broadcast address.	<b>detail extensive</b> none
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b> none
<b>DLCI</b>	<p>(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b>, <b>Total down time</b>, <b>Last down</b>, and <b>Traffic statistics</b> or (<b>Input packets</b>, <b>Output packets</b>). <b>Flags</b> can be one or more of the following:</p> <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when the link is active, but no information is received from the DCE.</li> <li>• <b>DCE-Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>DCE-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive</b> none
<b>DLCI statistics</b>	<p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive</b> none

Table 10: 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"> <li>• <b>CE Tx</b>—Number of transmitted packets and bytes (TDM to PSN flow).</li> <li>• <b>CE Rx</b>—Number of received packets and bytes and forward bytes (PSN to TDM flow).</li> <li>• <b>CE Rx Forwarded</b>—Number of forwarded bytes.</li> <li>• <b>CE Strayed</b>—Number of stray packets.</li> <li>• <b>CE Lost</b>—Number of lost packets.</li> <li>• <b>CE Malformed</b>—Number of malformed packets</li> <li>• <b>CE Misinserted</b>—Number of misinserted packets.</li> <li>• <b>CE AIS dropped</b>—Number of dropped bytes due to buffer overrun (PSN to TDM).</li> <li>• <b>CE Dropped</b>—Number of dropped packets during resynchronization</li> <li>• <b>CE Overrun Events</b>—Number of overrun events.</li> <li>• <b>CE Underrun Events</b>—Number of underrun events.</li> </ul>	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 timeout : 1
  CoS queues : 8 supported
  Last flapped : 2005-11-30 14:50:34 PST (4d 20:33 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes : 0 0 bps
    Output bytes : 225 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                0          0
Tx-Stuff              0          0
Rx-SES                 0          0
Rx-UAS                 0          0
Rx-UUS                 1          0
Tx-UUS                 0          0
FE-Rx-SES             0          0
FE-Rx-UAS             0          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          Bandwidth          Buffer Priority
Limit                          %          bps          %          usec          low
    0 best-effort              95          1459200      95          0          low
none
    3 network-control          5           76800       5           0          low
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
    %      bps      %      usec
    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)

<b>Syntax</b>	<pre>show interfaces <i>interface-type</i> &lt;brief   detail   extensive   terse&gt; &lt;descriptions&gt; &lt;media&gt; &lt;snmp-index <i>snmp-index</i>&gt; &lt;statistics&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	Display status information about the specified T3 or E3 interface.
<b>Options</b>	<p><b><i>interface-type</i></b>—On M Series and T Series routers, the T3 interface type is <b>t3-fpc/pic/port</b>, whereas the E3 interface type is <b>e3-fpc/pic/port</b>. On the J Series routers, the T3 interface type is <b>t3-pim/0/port</b>, whereas the E3 interface type is <b>e3-pim/0/port</b>.</p> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>descriptions</b>—(Optional) Display interface description strings.</p> <p><b>media</b>—(Optional) Display media-specific information about network interfaces.</p> <p><b>snmp-index <i>snmp-index</i></b>—(Optional) Display information for the specified SNMP index of the interface.</p> <p><b>statistics</b>—(Optional) Display static interface statistics.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<p><a href="#">show interfaces (T3, PPP) on page 219</a></p> <p><a href="#">show interfaces detail (T3, PPP) on page 220</a></p> <p><a href="#">show interfaces extensive (T3, PPP) on page 221</a></p> <p><a href="#">show interfaces (E3, Frame Relay) on page 222</a></p> <p><a href="#">show interfaces detail (E3, Frame Relay) on page 223</a></p> <p><a href="#">show interfaces extensive (E3, Frame Relay) on page 224</a></p>
<b>Output Fields</b>	Table 11 on page 210 lists the output fields for the <b>show interfaces</b> (T3 or E3) command. Output fields are listed in the approximate order in which they appear.

Table 11: T3 or E3 show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
<b>Physical interface</b>	Name of the physical interface.	All levels
<b>Enabled</b>	State of the interface. Possible values are described in the “Enabled Field” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface index</b>	Physical interface's index number, which reflects its initialization sequence.	<b>detail extensive</b> none

Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>SNMP ifIndex</b>	SNMP index number for the physical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Link-level type</b>	Encapsulation being used on the physical interface.	All levels
<b>MTU</b>	MTU size on the physical interface.	All levels
<b>Clocking</b>	Reference clock source. It can be <b>Internal</b> or <b>External</b> .	All levels
<b>Speed</b>	Speed at which the interface is running.	All levels
<b>Loopback</b>	Whether loopback is enabled and the type of loopback ( <b>local</b> or <b>remote</b> ).	All levels
<b>FCS</b>	Frame check sequence on the interface (either <b>16</b> or <b>32</b> ). The default is <b>16</b> bits.	All levels
<b>Mode</b>	(T3 only) Whether C-bit parity mode or M13 mode is enabled.	All levels
<b>Long buildout</b>	(T3 only) Buildout setting: less than 255 feet (68 meters) or greater than 255 feet and shorter than 450 feet (137 meters).	All levels
<b>Framing</b>	(E3 only) Physical layer framing format used on the link. It can be <b>G751</b> or <b>Unframed</b> . The default is <b>G751</b> .	All levels
<b>Device flags</b>	Information about the physical device. Possible values are described in the “Device Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Interface flags</b>	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Link flags</b>	Information about the link. Possible values are described in the “Link Flags” section under <i>Common Output Fields Description</i> .	All levels
<b>Hold-times</b>	Current interface hold-time up and hold-time down, in milliseconds.	<b>detail extensive</b>
<b>Keepalive settings</b>	(PPP and HDLC) Configured settings for keepalives. <ul style="list-style-type: none"> <li><b>interval seconds</b>—Time in seconds between successive keepalive requests. The range is <b>10</b> seconds through <b>32,767</b> seconds, with a default of <b>10</b> seconds.</li> <li><b>down-count number</b>—Number of keepalive packets a destination must fail to receive before the network takes a link down. The range is <b>1</b> through <b>255</b>, with a default of <b>3</b>.</li> <li><b>up-count number</b>—Number of keepalive packets a destination must receive to change a link’s status from down to up. The range is <b>1</b> through <b>255</b>, with a default of <b>1</b>.</li> </ul>	<b>detail extensive none</b>

Table 11: 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"> <li><b>Input</b>—Number of keepalive packets received by PPP. <ul style="list-style-type: none"> <li><b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was received, in the format <i>hh:mm:ss</i>.</li> </ul> </li> <li><b>Output</b>—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"> <li><b>(last seen 00:00:00 ago)</b>—Time since the last keepalive packet was sent, in the format <i>hh:mm:ss</i>.</li> </ul> </li> </ul>	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 <b>LMI settings: value, value... xx seconds</b>, where <i>value</i> can be:</p> <ul style="list-style-type: none"> <li><b>n391dte</b>—DTE full status polling interval (1–255)</li> <li><b>n392dce</b>—DCE error threshold (1–10)</li> <li><b>n392dte</b>—DTE error threshold (1–10)</li> <li><b>n393dce</b>—DCE monitored event count (1–10)</li> <li><b>n393dte</b>—DTE monitored event count (1–10)</li> <li><b>t391dte</b>—DTE polling timer (5–30 seconds)</li> <li><b>t392dce</b>—DCE polling verification timer (5–30 seconds)</li> </ul>	detail extensive none
LMI	<p>(Frame Relay) LMI statistics:</p> <ul style="list-style-type: none"> <li><b>Input</b>—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 <b>Input: nn (last seen hh:mm:ss ago)</b>.</li> <li><b>Output</b>—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 <b>Output: nn (last sent hh:mm:ss ago)</b>.</li> </ul>	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"> <li><b>Enquiries sent</b>—Number of link status enquiries sent from the DTE to the DCE.</li> <li><b>Full enquiries sent</b>—Number of full enquiries sent from the DTE to the DCE.</li> <li><b>Enquiry responses received</b>—Number of enquiry responses received by the DTE from the DCE.</li> <li><b>Full enquiry responses received</b>—Number of full enquiry responses sent from the DTE to the DCE.</li> </ul>	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"> <li><b>Enquiries received</b>—Number of enquiries received by the DCE from the DTE.</li> <li><b>Full enquiries received</b>—Number of full enquiries received by the DCE from the DTE.</li> <li><b>Enquiry responses sent</b>—Number of enquiry responses sent from the DCE to the DTE.</li> <li><b>Full enquiry responses sent</b>—Number of full enquiry responses sent from the DCE to the DTE.</li> </ul>	detail extensive none

Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Common statistics</b>	(Frame Relay) Statistics about messages sent between the DTE and the DCE: <ul style="list-style-type: none"> <li><b>Unknown messages received</b>—Number of received packets that do not fall into any category.</li> <li><b>Asynchronous updates received</b>—Number of link status peer changes received.</li> <li><b>Out-of-sequence packets received</b>—Number of packets for which the sequence of the packets received is different from the expected sequence.</li> <li><b>Keepalive responses timedout</b>—Number of keepalive responses that timed out when no LMI packet was reported for <b>n392dte</b> or <b>n393dce</b> intervals. (See <b>LMI settings</b>.)</li> </ul>	<b>detail extensive none</b>
<b>Nonmatching DCE-end DLCIs</b>	(Frame Relay. Displayed only from the DTE.) Number of DLCIs configured from the DCE.	<b>detail extensive none</b>
<b>LCP state</b>	(PPP) Link Control Protocol state. <ul style="list-style-type: none"> <li><b>Conf-ack-received</b>—Acknowledgement was received.</li> <li><b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li><b>Conf-req-sent</b>—Request was sent.</li> <li><b>Down</b>—LCP negotiation is incomplete (not yet completed or has failed).</li> <li><b>Opened</b>—LCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>NCP state</b>	(PPP) Network Control Protocol state. <ul style="list-style-type: none"> <li><b>Conf-ack-received</b>—Acknowledgement was received.</li> <li><b>Conf-ack-sent</b>—Acknowledgement was sent.</li> <li><b>Conf-req-sent</b>—Request was sent.</li> <li><b>Down</b>—NCP negotiation is incomplete (not yet completed or has failed).</li> <li><b>Opened</b>—NCP negotiation is successful.</li> </ul>	<b>detail extensive none</b>
<b>CHAP state</b>	(PPP) Displays the state of the Challenge Handshake Authentication Protocol (CHAP) during its transaction. <ul style="list-style-type: none"> <li><b>Chap-Resp-received</b>—Response received for the challenge sent, but CHAP not yet moved into the Success state. (Most likely with RADIUS authentication.)</li> <li><b>Chap-Resp-sent</b>—Response sent for the challenge received.</li> <li><b>Chap-Chal-sent</b>—Challenge sent.</li> <li><b>Chap-Chal-received</b>—Challenge received but response not yet sent.</li> <li><b>Down</b>—CHAP authentication is incomplete (not yet completed or has failed).</li> <li><b>Not-configured</b>—CHAP is not configured on the interface.</li> <li><b>Opened</b>—CHAP authentication was successful.</li> </ul>	<b>detail extensive none</b>
<b>Last flapped</b>	Date, time, and how long ago the interface went from down to up. The format is <b>Last flapped: year-month-day hour:minute:second timezone (year-month-day hour:minute:second ago)</b> . For example, <b>Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> .	<b>detail extensive none</b>
<b>CoS queues</b>	Number of CoS queues configured.	<b>detail extensive none</b>

Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Input rate</b>	Input rate in bits per second (bps) and packets per second (pps).	None specified
<b>Output rate</b>	Output rate in bps and pps.	None specified
<b>Statistics last cleared</b>	Time when the statistics for the interface were last set to zero.	<b>detail extensive</b>
<b>Traffic statistics</b>	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface</li> <li>• <b>Output packets</b>—Number of packets received on the interface.</li> </ul>	<b>detail extensive</b>
<b>Input errors</b>	<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"> <li>• <b>Errors</b>—Sum of the incoming frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Framing errors</b>—Number of packets received with an invalid frame checksum (FCS).</li> <li>• <b>Runts</b>—(T3 only) Number of frames received that are smaller than the runt threshold.</li> <li>• <b>Giants</b>—(T3 only) Number of frames received that are larger than the giant threshold.</li> <li>• <b>Bucket Drops</b>—Drops resulting from the traffic load exceeding the interface transmit/receive leaky bucket configuration. The default is <b>off</b>.</li> <li>• <b>Policed discards</b>—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.</li> <li>• <b>L3 incompletes</b>—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.</li> <li>• <b>L2 channel errors</b>—Number of times the software did not find a valid logical interface for an incoming frame.</li> <li>• <b>L2 mismatch timeouts</b>—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable.</li> <li>• <b>HS link CRC errors</b>—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces.</li> <li>• <b>SRAM errors</b>—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.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>



Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Output errors</b>	<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"> <li>• <b>Carrier transitions</b>—Number of times the interface has gone from <b>down</b> to <b>up</b>. 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.</li> <li>• <b>Errors</b>—Sum of the outgoing frame aborts and FCS errors.</li> <li>• <b>Drops</b>—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.</li> <li>• <b>Aged packets</b>—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.</li> <li>• <b>MTU errors</b>—Number of packets whose size exceeded the MTU of the interface.</li> <li>• <b>Resource errors</b>—Sum of transmit drops.</li> </ul>	<b>extensive</b>
<b>Queue counters</b>	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> <li>• <b>Queued packets</b>—Number of queued packets.</li> <li>• <b>Transmitted packets</b>—Number of transmitted packets.</li> <li>• <b>Dropped packets</b>—Number of packets dropped by the ASIC's RED mechanism.</li> </ul>	<b>detail extensive</b>
<b>Active alarms</b> <b>Active defects</b>	<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"> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>FERF</b>—Far-end receive failures</li> <li>• <b>IDLE</b>—Idle code detected</li> <li>• <b>LCD</b>—Loss of cell delineation</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>PLL</b>—Phase-locked loop</li> <li>• <b>YLW</b>—Remote defect indication</li> </ul>	<b>detail extensive none</b>

Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>DS3 media or E3 media</b>	<p>Counts of DS3 (T3) or E3 media-specific errors.</p> <ul style="list-style-type: none"> <li>• <b>Seconds</b>—Number of seconds the defect has been active.</li> <li>• <b>Count</b>—Number of times that the defect has gone from inactive to active.</li> <li>• <b>State</b>—State of the error. State other than OK indicates a problem.</li> </ul> <p>The DS3 or E3 media-specific error types can be:</p> <ul style="list-style-type: none"> <li>• <b>PLL Lock</b>—Phase-locked loop out of lock</li> <li>• <b>Reframing</b>—Frame alignment recovery time</li> <li>• <b>AIS</b>—Alarm indication signal</li> <li>• <b>LOF</b>—Loss of frame</li> <li>• <b>LOS</b>—Loss of signal</li> <li>• <b>IDLE</b>—Idle code detected</li> <li>• <b>YELLOW</b>—Errors at the remote site receiver</li> <li>• <b>BPV</b>—Bipolar violation</li> <li>• <b>EXZ</b>—Excessive zeros</li> <li>• <b>LCV</b>—Line code violation</li> <li>• <b>PCV</b>—(DS3 only) Pulse code violation</li> <li>• <b>CCV</b>—(DS3 only) C-bit coding violation</li> <li>• <b>FEBE</b>—(DS3 only) Far-end block error</li> <li>• <b>LES</b>—Line error seconds</li> <li>• <b>PES</b>—(DS3 only) P-bit errored seconds</li> <li>• <b>PSSES</b>—(DS3 only) P-bit errored seconds (section)</li> <li>• <b>CES</b>—(DS3 only) C-bit errored seconds</li> <li>• <b>CSES</b>—(DS3 only) C-bit severely errored seconds</li> <li>• <b>SEFS</b>—Severely errored framing seconds</li> <li>• <b>UAS</b>—Unavailable seconds</li> </ul>	<b>extensive</b>
<b>HDLC configuration</b>	<p>Information about the HDLC configuration.</p> <ul style="list-style-type: none"> <li>• <b>Policing bucket</b>—Configured state of the receiving policer.</li> <li>• <b>Shaping bucket</b>—Configured state of the transmitting shaper.</li> <li>• <b>Giant threshold</b>—Giant threshold programmed into the hardware.</li> <li>• <b>Runt threshold</b>—Runt threshold programmed into the hardware.</li> <li>• <b>Idle cycle flag</b>—Idle cycle flags.</li> <li>• <b>Start end flag</b>—Start and end flag.</li> </ul>	<b>extensive</b>

Table 11: 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 (<b>Bit count</b>, <b>Error bit count</b>, and <b>LOS information</b>) are displayed only if a BERT has ever been run on the interface.</p> <ul style="list-style-type: none"> <li>• <b>Compatibility mod</b>—CSU/DSU compatibility mode: <b>None</b>, <b>Larscom</b>, <b>Kentrox</b>, or <b>Digital-Link</b>.</li> <li>• <b>Scrambling</b>—Payload scrambling: <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Subrate</b>—Configured subrate setting. Applies only when <b>Digital-Link</b> compatibility mode is used. The subrate can be <b>Disabled</b> or display units in Kbps.</li> <li>• <b>FEAC loopbac</b>—(T3) Whether a far-end alarm and control (FEAC) loopback is <b>Active</b> or <b>Inactive</b>. 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.</li> <li>• <b>Response</b>—Whether the FEAC signal is <b>Enabled</b> or <b>Disabled</b>.</li> <li>• <b>Count</b>—Number of FEAC loopbacks.</li> </ul>	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"> <li>• <b>BERT time period</b>—Configured total time period that the BERT is to run.</li> <li>• <b>Elapsed</b>—Actual time elapsed since the start of the BERT (in seconds).</li> <li>• <b>Induced error rate</b>—Configured rate at which the bit errors are induced in the BERT pattern.</li> <li>• <b>Algorithm</b>—Type of algorithm selected for the BERT.</li> </ul>	detail extensive none
Packet Forwarding Engine configuration	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> <li>• <b>Destination slot</b>—FPC slot number.</li> <li>• <b>PLP byte</b>—Packet Level Protocol byte.</li> </ul>	extensive
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> <li>• <b>CoS transmit queue</b>—Queue number and its associated user-configured forwarding class name.</li> <li>• <b>Bandwidth %</b>—Percentage of bandwidth allocated to the queue.</li> <li>• <b>Bandwidth bps</b>—Bandwidth allocated to the queue (in bps).</li> <li>• <b>Buffer %</b>—Percentage of buffer space allocated to the queue.</li> <li>• <b>Buffer usec</b>—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.</li> <li>• <b>Priority</b>—Queue priority: <b>low</b> or <b>high</b>.</li> <li>• <b>Limit</b>—Displayed if rate limiting is configured for the queue. Possible values are <b>none</b> and <b>exact</b>. If <b>exact</b> is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If <b>none</b> is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.</li> </ul>	extensive

---

#### Logical Interface

---

Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Logical interface</b>	Name of the logical interface.	<b>detail extensive none</b>
<b>Index</b>	Logical interface index number, which reflects its initialization sequence.	<b>detail extensive none</b>
<b>SNMP ifIndex</b>	Logical interface SNMP interface index number.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>extensive</b>
<b>Flags</b>	Information about the interface. Possible values are described in the "Interface Flags" section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Encapsulation</b>	Encapsulation on the logical interface.	<b>detail extensive none</b>
<b>Input packets</b>	Number of packets received on the logical interface.	None specified
<b>Output packets</b>	Number of packets transmitted on the logical interface.	None specified
<b>Traffic statistics</b>	<p>(Frame Relay) Number and rate of bytes and packets received and transmitted on the logical interface.</p> <ul style="list-style-type: none"> <li>• <b>Input bytes</b>—Number of bytes received on the interface.</li> <li>• <b>Output bytes</b>—Number of bytes transmitted on the interface.</li> <li>• <b>Input packets</b>—Number of packets received on the interface.</li> <li>• <b>Output packets</b>—Number of packets transmitted on the interface.</li> </ul>	<b>detail extensive</b>
<b>Local statistics</b>	(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.	<b>detail extensive</b>
<b>Transit statistics</b>	(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.	<b>detail extensive</b>
<b>Protocol</b>	Protocol family configured on the logical interface, such as <b>iso</b> , <b>inet6</b> , <b>mlfr</b> , or <b>mpls</b> .	<b>detail extensive none</b>
<b>Multilink bundle</b>	(Multilink) Interface name for the multilink bundle.	<b>detail extensive none</b>
<b>MTU</b>	MTU size on the logical interface.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive</b>
<b>Route table</b>	Routing table in which the logical interface address is located. For example, 0 refers to the routing table inet.0.	<b>detail extensive</b>
<b>Flags</b>	Information about the protocol family flags. Possible values are described in the "Family Flags" section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>

Table 11: T3 or E3 show interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Addresses, Flags</b>	Information about the address flags. Possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	<b>detail extensive none</b>
<b>Destination</b>	IP address of the remote side of the connection.	<b>detail extensive none</b>
<b>Local</b>	IP address of the logical interface.	<b>detail extensive none</b>
<b>Broadcast</b>	Broadcast address.	<b>detail extensive none</b>
<b>Generation</b>	Unique number for use by Juniper Networks technical support only.	<b>detail extensive none</b>
<b>DLCI</b>	<p>(Frame Relay) DLCI number of the logical interface. The following DLCI information is displayed: <b>Flags</b>, <b>Total down time</b>, <b>Last down</b>, and <b>Traffic statistics</b> (or <b>Input packets</b>, <b>Output packets</b>). <b>Flags</b> is one or more of the following:</p> <ul style="list-style-type: none"> <li>• <b>Active</b>—Set when the link is active and the DTE and DCE are exchanging information.</li> <li>• <b>Down</b>—Set when the link is active, but no information is received from the DCE.</li> <li>• <b>DCE Unconfigured</b>—Set when the corresponding DLCI in the DCE is not configured.</li> <li>• <b>Configured</b>—Set when the corresponding DLCI in the DCE is configured.</li> <li>• <b>DCE-configured</b>—Displayed when the command is issued from the DTE.</li> </ul>	<b>detail extensive none</b>
<b>DLCI statistics</b>	<p>(Frame Relay) Data-link connection identifier (DLCI) statistics.</p> <ul style="list-style-type: none"> <li>• <b>Active DLCI</b>—Number of active DLCIs.</li> <li>• <b>Inactive DLCI</b>—Number of inactive DLCIs.</li> </ul>	<b>detail extensive none</b>

## 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

```

## PART 4

# Troubleshooting

- [Interface Diagnostics on page 229](#)



## CHAPTER 6

# Interface Diagnostics

- [Interface Diagnostics on page 229](#)

## 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 229](#)
- [Interface Diagnostics on page 231](#)

## 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 12 on page 230 shows the loopback modes supported on the various interface types.

**Table 12: 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 12: 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* gigether-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 13 on page 234 shows the BERT capabilities for various interface types.

**Table 13: 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"> <li>Limited algorithms</li> </ul>
4-port Channelized OC3/STM1 Circuit Emulation	Yes (port 0–3)		<ul style="list-style-type: none"> <li>Limited algorithms</li> </ul>
E1 or T1	Yes (port 0–3)	Yes (port 0–3)	<ul style="list-style-type: none"> <li>Single port at a time</li> <li>Limited algorithms</li> </ul>
E3 or T3	Yes (port 0–3)	Yes (port 0–3)	<ul style="list-style-type: none"> <li>Single port at a time</li> </ul>
Channelized OC12	N/A	Yes (channel 0–11)	<ul style="list-style-type: none"> <li>Single channel at a time</li> <li>Limited algorithms</li> <li>No bit count</li> </ul>
Channelized STM1	Yes (channel 0–62)	N/A	<ul style="list-style-type: none"> <li>Multiple channels</li> <li>Only one algorithm</li> <li>No error insert</li> <li>No bit count</li> </ul>
Channelized T3 and Multichannel T3	Yes (channel 0–27)	Yes (port 0–3 on channel 0)	<ul style="list-style-type: none"> <li>Multiple ports and channels</li> <li>Limited algorithms for T1</li> <li>No error insert for T1</li> <li>No bit count for T1</li> </ul>

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 [CLI Explorer](#).



**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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