Chapter 27

Monitor Channelized OC-12 Interfaces

This chapter describes how to monitor Channelized OC-12 interfaces and begin the process of isolating Channelized OC-12 interface problems when they occur. (See Table 57.)

Table 57: Checklist for Monitoring Channelized OC-12 Interfaces

Monitor Channelized OC-12 Interfaces Tasks	Command or Action
Monitor Channelized OC-12 Interfaces on page 282	
1. Display the Status of Channelized OC-12 Interfaces on page 282	show interfaces terse t3-*interface-name**
2. Display the Status of a Specific Channelized OC-12 Interface on page 283	show interfaces terse t3-*fpc/pic/port:channel*
3. Display Extensive Status Information for a Specific Channelized OC-12 Interface on page 283	show interfaces t3-*fpc/pic/port:channel* extensive
4. Monitor Statistics for a Channelized OC-12 Interface on page 286	monitor interfaces t3-*fpc/pic/port:channel*
Monitor Channelized OC-12 IQ Interfaces on page 287	
1. Display the Status of a Channelized OC-12 IQ Interface on page 287	show interfaces terse coc* show interfaces controller show interfaces terse
2. Display the Status of the Controller Channelized OC-12 IQ Interface on page 291	show interfaces *interface-type-fpc/pic/port* show interfaces *interface-type-fpc/pic/port:channel* show interfaces *interface-type-fpc/pic/port:channel:channel* show interfaces *interface-type-fpc/pic/port:channel:channel:channel*
3. Display the Status of a Specific Channel of a Channelized OC-12 IQ Interface on page 293	show interfaces *interface-type-fpc/pic/port:channel* show interfaces *interface-type-fpc/pic/port:channel:channel* show interfaces *interface-type-fpc/pic/port:channel:channel:channel*
4. Display Extensive Status Information for a Channelized OC-12 IQ Interface on page 295	show interfaces *interface-type-interface-name* extensive
5. Monitor Statistics for a Channelized OC-12 IQ Interface on page 298	monitor interfaces *interface-type-fpc/pic/port:channel*

Monitor Channelized OC-12 Interfaces

Purpose By monitoring Channelized OC-12 interfaces, you begin the process of isolating Channelized OC-12 interface problems when they occur.

Steps To Take To monitor your Channelized OC-12 interfaces, follow these steps:

1. Display the Status of Channelized OC-12 Interfaces on page 282
2. Display the Status of a Specific Channelized OC-12 Interface on page 283
3. Display Extensive Status Information for a Specific Channelized OC-12 Interface on page 283
4. Monitor Statistics for a Channelized OC-12 Interface on page 286

Step 1: Display the Status of Channelized OC-12 Interfaces

Action To display the status of Channelized OC-12 interfaces, use the following JUNOS command-line interface (CLI) operational mode command:

user@host> **show interfaces terse t3-***interface-name**

Sample Output 1 The following sample output is for a Channelized OC-12 interface:

```
user@host> show interfaces terse t3-0/3/0:*
Interface           Admin Link Proto Local                 Remote
t3-0/3/0:0          up    up
t3-0/3/0:1          up    up
t3-0/3/0:2          up    up
t3-0/3/0:3          up    up
t3-0/3/0:4          up    up
t3-0/3/0:5          up    up
t3-0/3/0:6          up    up
t3-0/3/0:7          up    up
t3-0/3/0:8          up    up
t3-0/3/0:9          up    up
t3-0/3/0:10         up    up
t3-0/3/0:11         up    down
```

What It Means The sample output shows the status of both the physical and logical interfaces. In this example, all of the Channelized OC-12 interfaces are up except the channel interface t3-0/3/0:11.

When only one or some individual T3 channels are down, you must troubleshoot the T3 channel by checking the configuration, transmission network, and equipment. If all of the physical layers for the T3 channels are down, you must work with this as a T3 or OC-12 SONET link, or a Physical Interface Card (PIC) problem. For more information on monitoring SONET interfaces, see “Monitor Channelized OC-12 Interfaces” on page 281.

Step 2: Display the Status of a Specific Channelized OC-12 Interface

Action To display the status of specific Channelized OC-12 interface, use the following JUNOS CLI operational mode command:

user@host> **show interfaces terse t3-***fpc*/*pic*/*port*:*channel*

Sample Output

```
user@host> show interfaces terse t3-0/3/0:0
Interface               Admin Link Proto Local                 Remote
t3-0/3/0:0              up    up

user@host> show interfaces terse t3-0/3/0:11
Interface               Admin Link Proto Local                 Remote
t3-0/3/0:11             up    down
```

What It Means. The first line of the output shows the status of the link. If this line shows that the physical link is up, the physical link is healthy and can pass packets. If this line shows that the physical link is down, the physical link is unhealthy and cannot pass packets.

When only one or some individual T3 channels are down, you must troubleshoot the T3 channel by checking the configuration, transmission network, and equipment. If all of the physical layers for the T3 channels are down, you must work with this as an OC-12 SONET link or PIC problem. For more information on monitoring SONET interfaces, see “Monitor Channelized OC-12 Interfaces” on page 281.

Step 3: Display Extensive Status Information for a Specific Channelized OC-12 Interface

Action To display extensive status information for a Channelized OC-12 interface, use the following JUNOS CLI operational mode command:

user@host> **show interfaces t3-***fpc*/*pic*/*port*:*channel* **extensive**

Sample Output

```
user@host> show interfaces t3-0/3/0:0 extensive
Physical interface: t3-0/3/0:0, Enabled, Physical link is Up
  Interface index: 193, SNMP ifIndex: 118, Generation: 122
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: T3,
  Loopback: Local, SONET Loopback: None, FCS: 16, Mode: C/Bit parity
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives
  Hold-times     : Up 0 ms, Down 0 ms
  CoS queues     : 4 supported
  Last flapped   : 2004-05-21 15:23:34 UTC (01:59:02 ago)
  Statistics last cleared: Never
  Traffic statistics:
   Input  bytes :                0                0 bps
   Output bytes :                0                0 bps
   Input  packets:               0                0 pps
   Output packets:               0                0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 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
  Output errors:
    Carrier transitions: 1, 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                  0           0  OK
  LOS                  0           0  OK
  IDLE                 0           0  OK
  YELLOW               0           0  OK
  BPV                  0           0
  EXZ                  0           0
  LCV                  0           0
  PCV                  0           0
  CCV                  0           0
  LES                  0
  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
DS-3 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Algorithm: 2^3 - 1, Pseudorandom (1), Induced error rate: 10e-0
Interface transmit queues:
                B/W  WRR       Packets        Bytes
  Queue0        0    0
    Transmitted:                    0            0
    Drops:                          0            0
    Errors:                         0
  Queue1        0    0
    Transmitted:                    0            0
    Drops:                          0            0
    Errors:                         0
  Queue2        0    0
    Transmitted:                    0            0
    Drops:                          0            0
    Errors:                         0
  Queue3        0    0
    Transmitted:                    0            0
    Drops:                          0            0
    Errors:                         0
SONET PHY:          Seconds       Count  State
  PLL Lock             0           0  OK
  PHY Light            0           0  OK
SONET section:
  BIP-B1               1          22
  SEF                  0           0  OK
  LOS                  0           0  OK
  LOF                  0           0  OK
  ES-S                 1
  SES-S                0
  SEFS-S               0
SONET line:
  BIP-B2               1         307
```

```
  REI-L                0          0
  RDI-L                3          1  OK
  AIS-L                0          0  OK
  BERR-SF                0          0  OK
  BERR-SD                0          0  OK
  ES-L                 1
  SES-L                0
  UAS-L                0
  ES-LFE               3
  SES-LFE                3
  UAS-LFE                0
SONET path:
  BIP-B3               1          35
  REI-P                1          7
  LOP-P                0          0  OK
  AIS-P                0          0  OK
  RDI-P                0          0  OK
  UNEQ-P                 0          0  OK
  PLM-P                1          1  OK
  ES-P                 1
  SES-P                0
  UAS-P                0
  ES-PFE               1
  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
Transmitted SONET overhead:
  F1     : 0x00, J0     : 0x01, K1     : 0x00, K2     : 0x00
  S1     : 0x00, C2     : 0x04, F2     : 0x00, Z3     : 0x00
  Z4     : 0x00
Received path trace: t3-0/1/0:0
  74 33 2d 30 2f 31 2f 30 3a 30 00 00 00 00 0d 0a   t3-0/1/0:0.....
Transmitted path trace: t3-0/3/0:0
  74 33 2d 30 2f 33 2f 30 3a 30 00 00 00 00 00 00   t3-0/3/0:0.....
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 1 (0x00)
  CoS transmit queue           Bandwidth          Buffer Priority   Limit
                          %        bps   %       bytes
  0 best-effort          95     42499200  95          0     low    none
  3 network-control       5      2236800   5          0     low    none
```

What It Means The sample output shows where the errors might be occurring, either with the T3 media or the SONET layer. In this example, there are no SONET or DS-3 alarms or defects. However, if errors occur, you must troubleshoot the T3 media or the SONET layer. For more information on diagnosing a T3 media problem, see “Investigate T3 Interfaces” on page 49. For more information about diagnosing a SONET layer problem, see “Investigate SONET Interfaces” on page 127.

Step 4: Monitor Statistics for a Channelized OC-12 Interface

Action To monitor statistics for a Channelized OC-12 interface, use the following JUNOS CLI operational mode command:

user@host> **monitor interfaces t3-***fpc*/*pic*/*port*:*channel*

Sample Output

```
user@host> monitor interfaces t3-0/3/0:11
host                          Seconds: 12          Time: 17:27:15
                                    Delay: 32/0/32
Interface: t3-0/3/0:11, Enabled, Link is Down
Encapsulation: Cisco-HDLC, Keepalives, Speed: T3
Traffic statistics:                          Current delta
  Input bytes:              109846 (176 bps)          [44]
  Output bytes:             110308 (176 bps)          [44]
  Input packets:              1687 (1 pps)            [2]
  Output packets:             1693 (1 pps)            [2]
Encapsulation statistics:
  Input keepalives:              8                    [2]
  Output keepalives:             7                    [2]
Error statistics:
  Input errors:                  0                    [0]
  Input drops:                   0                    [0]
  Input framing errors:       1066                    [0]
  Input runts:                   0                    [0]
  Input giants:                  0                    [0]
  Policed discards:              0                    [0]
  L3 incompletes:                0                    [0]
  L2 channel errors:             3                    [0]
  L2 mismatch timeouts:          0                    [0]
  Carrier transitions:           7                    [0]
  Output errors:                 0  Output drops:      [0]

Interface warnings:
  o Loopback detected while not in test mode
```

What It Means The sample output shows common interface failures, indicates whether loopback is detected, and shows increases in framing errors. Use information from this command to help narrow down possible causes of an interface problem.

NOTE: If you are accessing the router from the console connection, make sure you set the CLI terminal type using the set cli terminal command.

CAUTION: We recommend that you use this command only for diagnostic purposes. Do not leave it on during normal router operations because real-time monitoring of traffic consumes additional CPU and memory resources.

Monitor Channelized OC-12 IQ Interfaces

Purpose By monitoring Channelized OC-12 intelligent queuing (IQ) interfaces, you begin the process of isolating Channelized OC-12 IQ interface problems when they occur.

Steps To Take To monitor your Channelized OC-12 IQ interface, follow these steps:

1. Display the Status of a Channelized OC-12 IQ Interface on page 287
2. Display the Status of the Controller Channelized OC-12 IQ Interface on page 291
3. Display the Status of a Specific Channel of a Channelized OC-12 IQ Interface on page 293
4. Display Extensive Status Information for a Channelized OC-12 IQ Interface on page 295
5. Monitor Statistics for a Channelized OC-12 IQ Interface on page 298

Step 1: Display the Status of a Channelized OC-12 IQ Interface

Action To display the status of Channelized OC-12 IQ interfaces, use one or all of the following JUNOS CLI operational mode commands:

```
user@host> show interfaces terse coc*
user@host> show interfaces controller
user@host> show interfaces terse
```

Sample Output 1

```
user@host> show interfaces terse coc*
Interface             Admin Link Proto Local                 Remote
coc12-0/0/0           up    up
coc1-0/0/0:2          up    up
coc1-0/0/0:3          up    up
coc1-0/0/0:4          up    up
coc1-0/0/0:5          up    up
coc1-0/0/0:6          up    up
```

Sample Output 2

```
user@host> show interfaces controller
Controller                                 Admin Link
coc12-0/0/0                                up    up
  so-0/0/0:1                               up    up
  coc1-0/0/0:2                             up    up
    t1-0/0/0:2:1                           up    up
    t1-0/0/0:2:2                           up    up
    t1-0/0/0:2:3                           up    up
    t1-0/0/0:2:4                           up    up
    t1-0/0/0:2:5                           up    up
    t1-0/0/0:2:6                           up    up
    t1-0/0/0:2:7                           up    up
    t1-0/0/0:2:8                           up    up
    t1-0/0/0:2:9                           up    up
    t1-0/0/0:2:10                          up    up
    t1-0/0/0:2:11                          up    up
    t1-0/0/0:2:12                          up    up
    t1-0/0/0:2:13                          up    up
    t1-0/0/0:2:14                          up    up
    t1-0/0/0:2:15                          up    up
```

```
    t1-0/0/0:2:16                              up    up
    t1-0/0/0:2:17                              up    up
    t1-0/0/0:2:18                              up    up
    t1-0/0/0:2:19                              up    up
    t1-0/0/0:2:20                              up    up
    t1-0/0/0:2:21                              up    up
    t1-0/0/0:2:22                              up    up
    t1-0/0/0:2:23                              up    up
    t1-0/0/0:2:24                              up    up
    t1-0/0/0:2:25                              up    up
    t1-0/0/0:2:26                              up    up
    t1-0/0/0:2:27                              up    up
    t1-0/0/0:2:28                              up    up
  coc1-0/0/0:3                                 up    up
  t3-0/0/0:3                                  up    up
  coc1-0/0/0:4                                 up    up
    ct1-0/0/0:4:1                              up    up
      ds-0/0/0:4:1:1                           up    up
  coc1-0/0/0:5                                 up    up
  ct3-0/0/0:5                                 up    up
    t1-0/0/0:5:1                              up    up
  coc1-0/0/0:6                                 up    up
  ct3-0/0/0:6                                 up    up
    ct1-0/0/0:6:1                              up    up
      ds-0/0/0:6:1:1                           up    up
```

Sample Output 3

```
user@host> show interfaces terse
Interface               Admin Link Proto Local                 Remote
coc12-0/0/0             up    up
so-0/0/0:1              up    up
so-0/0/0:1.0            up    up   inet  20.20.20.1/30
coc1-0/0/0:2            up    up
t1-0/0/0:2:1            up    up
t1-0/0/0:2:1.0          up    up   inet  20.20.20.5/30
t1-0/0/0:2:2            up    up
[...Output Truncated...]
t1-0/0/0:2:27           up    up
t1-0/0/0:2:28           up    up
coc1-0/0/0:3            up    up
t3-0/0/0:3              up    up
coc1-0/0/0:4            up    up
ct1-0/0/0:4:1           up    up
ds-0/0/0:4:1:1          up    up
ds-0/0/0:4:1:1.0        up    up   inet  20.20.20.13/30
coc1-0/0/0:5            up    up
ct3-0/0/0:5             up    up
t1-0/0/0:5:1            up    up
t1-0/0/0:5:1.0          up    up   inet  20.20.20.17/30
coc1-0/0/0:6            up    up
ct3-0/0/0:6             up    up
ct1-0/0/0:6:1           up    up
ds-0/0/0:6:1:1          up    up
ds-0/0/0:6:1:1.0        up    up   inet  20.20.20.21/30
```

What It Means

The sample output shows the status of both the physical and logical interfaces. In this example, all of the channelized OC-12 IQ interfaces are up.

Sample output 1 shows the channelized interfaces that are configured, but not the channels for those channelized interfaces.

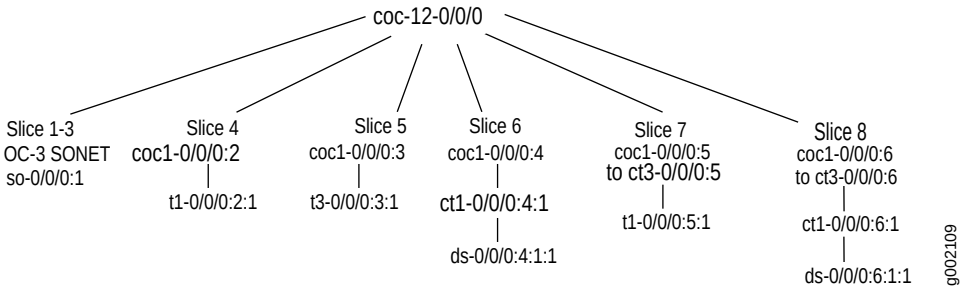
Sample output 2 shows the channels for the channelized interfaces that are configured and the hierarchy, but not the interface address information. At the top, the hierarchy includes the controller interface coc12-0/0/0.

Sample output 3 shows all channelized interfaces and their configured channels and the address information.

When only one or some individual channels are down, you must troubleshoot the channel by checking the configuration, transmission network, and equipment. If all of the physical layers for the channels are down, you must work with this as a T1, T3, DS-0, or OC-12 SONET link or PIC problem. For more information on monitoring these types of interfaces, see the respective sections in this guide.

The interface configuration of the OC-12 IQ interface used for all show commands in this section is shown in Figure 22.

Figure 22: Sample Configuration of Channelized OC-12 IQ Interface



In addition, the configuration is shown in the following output:

```
interfaces {
    coc12-0/0/0 {
        partition 1 oc-slice 1-3 interface-type so;
        partition 2 oc-slice 4 interface-type coc1;
        partition 3 oc-slice 5 interface-type coc1;
        partition 4 oc-slice 6 interface-type coc1;
        partition 5 oc-slice 7 interface-type coc1;
        partition 6 oc-slice 8 interface-type coc1;
    }
    so-0/0/0:1 {
      description "oc-slice 1-3 of coc12-0/0/0. COC12 > OC3.";
        unit 0 {
            family inet {
                address 20.20.20.2/30;
            }
        }
    }
    coc1-0/0/0:2 {
      description "oc-slice 4 of coc12-0/0/0. COC12 to COC-1 VT-mapped to T1s.";
        partition 1-28 interface-type t1;
    }
    t1-0/0/0:2:1 {
        unit 0 {
            family inet {
                address 20.20.20.6/30;
            }
```

```
        }
    }
    coc1-0/0/0:3 {
      description " oc-slice 5 of coc12-0/0/0. COC12 to COC-1 converted to a T3.";
        no-partition interface-type t3;
    }
    t3-0/0/0:3:1 {
        unit 0 {
            family inet {
                address 20.20.20.10/30;
            }
        }
    }
    coc1-0/0/0:4 {
      description " oc-slice 6 of coc12-0/0/0. CT1 to NxDS-Os.";
        partition 1 interface-type ct1;
    }
    ct1-0/0/0:4:1 {
        partition 1 timeslots 1-10 interface-type ds;
    }
    ds-0/0/0:4:1:1 {
        unit 0 {
            family inet {
                address 20.20.20.14/30;
            }
        }
    }
    coc1-0/0/0:5 {
      description " oc-slice 7 of coc12-0/0/0. COC12 to COC-1 converted to a CT3 to
T1s.";
        no-partition interface-type ct3;
    }
    ct3-0/0/0:5 {
        partition 1 interface-type t1;
    }
    t1-0/0/0:5:1 {
        unit 0 {
            family inet {
                address 20.20.20.18/30;
            }
        }
    }
    coc1-0/0/0:6 {
      description " oc-slice 8 of coc12-0/0/0. COC12 to COC-1 converted to a CT3 to
CT1 to NxDS-0s.";
        no-partition interface-type ct3;
    }
    ct3-0/0/0:6 {
        partition 1 interface-type ct1;
    }
    ct1-0/0/0:6:1 {
        partition 1 timeslots 1 interface-type ds;
    }
    ds-0/0/0:6:1:1 {
        unit 0 {
            family inet {
                address 20.20.20.22/30;
```

```
        }
      }
    }
}
```

The above configuration shows the OC-12 IQ interface configured into eight channels or slices as shown in Figure 22 on page 289. A summary of the channels follows:

Channels 1 through 3 are for SONET interfaces

Channel 4 is for T1 interfaces

Channel 5 is for T3 interfaces

Channel 6 is for DS-0 interfaces

Channels 7 is for T1 interfaces

Channel 8 is for DS-0 interfaces

Step 2: Display the Status of the Controller Channelized OC-12 IQ Interface

Action To display the status of the controller OC-12 IQ interface, use one or all of the following JUNOS CLI operational mode commands, depending on the level of channelization:

user@host> **show interfaces** *interface-type-fpc/pic/port*
user@host> **show interfaces** *interface-type-fpc/pic/port:channel*
user@host> **show interfaces** *interface-type-fpc/pic/port:channel:channel*
user@host> **show interfaces** *interface-type-fpc/pic/port:channel:channel:channel*

Sample Output 1

```
user@host> show interfaces coc12-0/0/0
Physical interface: coc12-0/0/0, Enabled, Physical link is Up
  Interface index: 195, SNMP ifIndex: 82
  Link-level type: Controller, Clocking: Internal, SONET mode, Speed: OC12,
  Loopback: None, Parent: None
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
  CoS queues     : 4 supported
  Last flapped   : 2004-05-26 21:37:18 UTC (00:44:19 ago)
  SONET alarms   : None
  SONET defects  : None
```

Sample Output 2

```
user@host> show interfaces coc1-0/0/0:2
Physical interface: coc1-0/0/0:2, Enabled, Physical link is Up
  Interface index: 198, SNMP ifIndex: 88
  Link-level type: Controller, Clocking: Internal, SONET mode, Speed: 51840kbps,
  Loopback: None, Parent: coc12-0/0/0 Interface index 195
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
  CoS queues     : 4 supported
  Last flapped   : 2004-05-26 22:19:18 UTC (00:07:06 ago)
  SONET alarms   : None
  SONET defects  : None
```

Sample Output 3

```
user@host> show interfaces ct3-0/0/0:5
Physical interface: ct3-0/0/0:5, Enabled, Physical link is Up
  Interface index: 233, SNMP ifIndex: 169
  Link-level type: Controller, Clocking: Internal, Speed: T3, Loopback: None,
  Mode: C/Bit parity, Parent: coc1-0/0/0:5 Interface index 232
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
  CoS queues     : 4 supported
  Last flapped   : Never
  Active alarms  : None
  Active defects : None
  DS-3 BERT configuration:
    BERT time period: 10 seconds, Elapsed: 0 seconds
    Algorithm: 2^3 - 1, Pseudorandom (1), Induced error rate: 10e-0
```

Sample Output 4

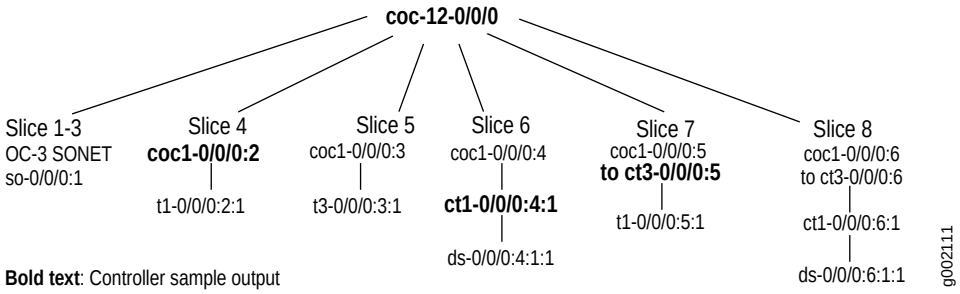
```
user@host> show interfaces ct1-0/0/0:4:1
Physical interface: ct1-0/0/0:4:1, Enabled, Physical link is Up
  Interface index: 230, SNMP ifIndex: 167
  Link-level type: Controller, Clocking: Internal, Speed: T1, Loopback: None,
  Framing: ESF, Parent: coc1-0/0/0:4 Interface index 229
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
  CoS queues     : 4 supported
  Last flapped   : Never
  DS1   alarms   : None
  DS1   defects  : None
  SONET alarms   : None
  SONET defects  : None
```

What It Means

The first line of the output shows the status of the link. If this line shows that the physical link is up, the physical link is healthy and can pass packets. If this line shows that the physical link is down, the physical link is unhealthy and cannot pass packets.

The controller interface is partitioned into other interface types and appears at the top of a specific level of channelization. For a visual representation of the controller interface at different levels of channelization, see Figure 23.

Figure 23: Controller Interfaces at Different Levels of Channelization



Each of the four examples of controller output is for a different level of channelization.

Sample output 1 for interface coc12-0/0/0 shows Parent: None, which indicates the top-most level of channelization.

Sample output 2 for interface coc1-0/0/0:2 shows Parent: coc12-0/0/0, which indicates that this interface is one level down from the top-most level, and is the OC1 controller for a first level of channelization.

Sample output 3 for interface ct3-0/0/0:5 shows Parent: coc1-0/0/0:5, which indicates that this interface is at the second level of channelization, and is a CT3 controller.

Sample output 4 for interface ct1-0/0/0:4:1 shows Parent: coc1-0/0/0:4:1, which indicates that this interface is at the third level of channelization, and is a CT1 controller.

Step 3: Display the Status of a Specific Channel of a Channelized OC-12 IQ Interface

Action To display the status of a specific channel of an OC-12 IQ interface, use the following JUNOS CLI operational mode command:

user@host> **show interfaces** *interface-type-fpc/pic/port:channel*
user@host> **show interfaces** *interface-type-fpc/pic/port:channel:channel*
user@host> **show interfaces** *interface-type-fpc/pic/port:channel:channel:channel*

Sample Output 1

```
user@host> show interfaces so-0/0/0:1
Physical interface: so-0/0/0:1, Enabled, Physical link is Up
  Interface index: 197, SNMP ifIndex: 131
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC3,
  Loopback: None, FCS: 16, Payload scrambler: Enabled,
  Parent: coc12-0/0/0 Interface index 195
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 17 (00:00:01 ago), Output: 17 (00:00:08 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   : 2004-05-26 22:19:18 UTC (00:02:59 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  SONET alarms   : None
  SONET defects  : None

  Logical interface so-0/0/0:1.0 (Index 70) (SNMP ifIndex 132)
    Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
    Protocol inet, MTU: 4470
      Flags: None
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: 20.20.20.0/30, Local: 20.20.20.1, Broadcast: 20.20.20.3
```

Sample Output 2

```
user@host> show interfaces t1-0/0/0:2:1
Physical interface: t1-0/0/0:2:1, Enabled, Physical link is Up
  Interface index: 199, SNMP ifIndex: 133
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF,
  Parent: coc1-0/0/0:2 Interface index 198
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives
```

```
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 44 (00:00:07 ago), Output: 46 (00:00:01 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   : Never
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  DS1   alarms   : None
  DS1   defects  : None
  SONET alarms   : None
  SONET defects  : None

  Logical interface t1-0/0/0:2:1.0 (Index 71) (SNMP ifIndex 134)
    Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
    Protocol inet, MTU: 1500
      Flags: None
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: 20.20.20.4/30, Local: 20.20.20.5, Broadcast: 20.20.20.7
```

Sample Output 3

```
user@host> show interfaces ds-0/0/0:4:1:1
Physical interface: ds-0/0/0:4:1:1, Enabled, Physical link is Up
  Interface index: 231, SNMP ifIndex: 168
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: 640kbps,
  Loopback: None, FCS: 16, Parent: ct1-0/0/0:4:1 Interface index 230
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 58 (00:00:06 ago), Output: 59 (00:00:01 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   : Never
  Input rate     : 48 bps (0 pps)
  Output rate    : 48 bps (0 pps)
  DS0 BERT configuration:
    BERT time period: 10 seconds, Elapsed: 0 seconds
    Induced Error rate: 10e-0, Algorithm: 2^15 - 1, O.151, Pseudorandom (9)

  Logical interface ds-0/0/0:4:1:1.0 (Index 75) (SNMP ifIndex 173)
    Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
    Protocol inet, MTU: 1500
      Flags: None
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: 20.20.20.12/30, Local: 20.20.20.13, Broadcast: 20.20.20.15
```

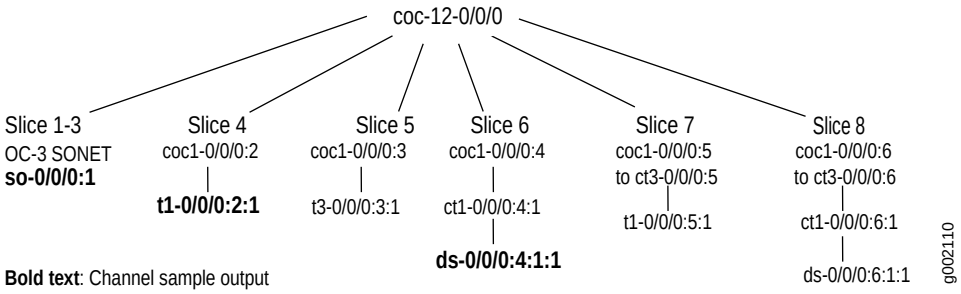
What It Means

The first line of the output shows the status of the link. If this line shows that the physical link is up, the physical link is healthy and can pass packets. If this line shows that the physical link is down, the physical link is unhealthy and cannot pass packets. All four examples of output show the link is up and can pass packets.

Sample output 1 shows an OC-3 SONET interface. Sample output 2 shows a T1 interface that is the result of a partitioned OC-1 interface, and sample output 3 shows a DS-0 interface that is the result of an OC-1 interface partitioned into a T1 interface, which is further partitioned into the DS-0 interface.

Figure 24 shows a visual representation of the different channel levels.

Figure 24: Specific Channels of a Channelized OC-12 IQ Interface



When only one or some individual channels are down, you must troubleshoot the channel by checking the configuration, transmission network, and equipment. If all of the physical layers for the channels are down, you must work with this as a T1, T3, DS-0, or OC-12 SONET link or PIC problem. For more information on monitoring these types of interfaces, see the respective sections in this guide.

Step 4: Display Extensive Status Information for a Channelized OC-12 IQ Interface

Action To display extensive status information for a Channelized OC-12 IQ interface, use the following JUNOS CLI operational mode command:

user@host> **show interfaces** *interface-type-interface-name* **extensive**

Sample Output 1 The following sample output is for a controller interface:

```
user@host> show interfaces coc12-0/0/0 extensive
Physical interface: coc12-0/0/0, Enabled, Physical link is Up
  Interface index: 138, SNMP ifIndex: 82, Generation: 21
  Link-level type: Controller, Clocking: Internal, SONET mode, Speed: OC12,
  Loopback: None, Parent: None
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link flags     : None
  Hold-times     : Up 0 ms, Down 0 ms
  CoS queues     : 4 supported
  Last flapped   : 2004-05-18 21:25:45 UTC (2d 00:04 ago)
  Statistics last cleared: Never
  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                    77           1  OK
    LOS                    77           1  OK
    LOF                    77           1  OK
    ES-S                   77
    SES-S                  77
    SEFS-S                 77
  SONET line:
    BIP-B2                  0           0
    REI-L               82584     1274876
    RDI-L                   5           1  OK
```

```
  AIS-L                0          0  OK
  BERR-SF             77          1  OK
  BERR-SD              2          1  OK
  ES-L                77
  SES-L               77
  UAS-L               67
  ES-LFE           82589
  SES-LFE              5
  UAS-LFE              0
 Received SONET overhead:
  F1     : 0x00, J0     : 0x00, K1     : 0x00, K2     : 0x00
  S1     : 0x00
 Transmitted SONET overhead:
  F1     : 0x00, J0     : 0x01, K1     : 0x00, K2     : 0x00
  S1     : 0x00
```

Sample Output 2 The following sample output is for a channel on a Channelized OC-12 IQ interface:

```
user@host> show interfaces t1-0/0/0:2:1 extensive
Physical interface: t1-0/0/0:2:1, Enabled, Physical link is Up
  Interface index: 186, SNMP ifIndex: 133, Generation: 69
  Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1,
  Loopback: None, FCS: 16, Framing: ESF,
  Parent: coc1-0/0/0:2 Interface index 185
  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 : 444 (last seen 00:00:05 ago)
    Output: 442 (last sent 00:00:09 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   : Never
  Statistics last cleared: Never
  Traffic statistics:
   Input  bytes :              10948                 0 bps
   Output bytes :              11792                 0 bps
   Input  packets:               892                 0 pps
   Output packets:               940                 0 pps
  Input errors:
    Errors: 2, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 2, L3 incompletes: 0, L2 channel errors: 0,
    L2 mismatch timeouts: 0, HS link CRC errors: 0, SRAM errors: 0
  Output errors:
    Carrier transitions: 1, Errors: 0, Drops: 0, Aged packets: 0
  Queue counters:       Queued packets  Transmitted packets      Dropped packets
    0 best-effort                  3                  3                   0
    1 expedited-fo                 0                  0                   0
    2 assured-forw                 0                  0                   0
    3 network-cont               937                937                   0
  DS1   alarms   : None
  DS1   defects  : None
  T1  media:           Seconds       Count  State
    SEF                  1           1  OK
    BEE                  2           2  OK
    AIS                  0           0  OK
    LOF                108           1  OK
```

```
  LOS                 0          0  OK
  YELLOW              0          0  OK
  BPV                 0          0
  EXZ                 0          0
  LCV                 1          1
  PCV                 0          0
  CS                  0          0
  LES                 108
  ES                  108
  SES                 108
  SEFS                108
  BES                 0
  UAS                 116
HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 1514, Runt threshold: 0
  Timeslots      : All active
  Line encoding: B8ZS, Byte encoding: Nx64K
  Buildout       : 0 to 132 feet
  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, O.151, Pseudorandom (9)
SONET alarms   : None
SONET defects  : None
SONET vt:
  BIP-BIP2            0          0
  REI-V               25         25
  LOP-V               93         1  OK
  AIS-V               0          0  OK
  RDI-V               0          0  OK
  UNEQ-V              0          0  OK
  PLM-V               93         1  OK
  ES-V                93
  SES-V               93
  UAS-V               83
  ES-VFE              25
  SES-VFE             25
  UAS-VFE             0
Received SONET overhead:
  V5     : 0x02, V5(cmp) : 0x02
Transmitted SONET overhead:
  V5     : 0x02
Packet Forwarding Engine configuration:
  Destination slot: 0, PLP byte: 4 (0x00)

Logical interface t1-0/0/0:2:1.0 (Index 70) (SNMP ifIndex 134)
(Generation 15)
  Flags: Point-To-Point SNMP-Traps Encapsulation: PPP
  Protocol inet, MTU: 1500, Generation: 24, Route table: 0
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 20.20.20.4/30, Local: 20.20.20.5, Broadcast: 20.20.20.7,
      Generation: 29
```

What It Means The sample output shows where the errors might be occurring: either with the channel media or the SONET layer. In this example, there are no errors. However, if errors occur, you must troubleshoot the channel media or the SONET layer. For more information, see the sections of this guide that correspond to the media with which you are working.

Step 5: Monitor Statistics for a Channelized OC-12 IQ Interface

Action To monitor statistics for a Channelized OC-12 interface, use the following JUNOS CLI operational mode command:

user@host> **monitor interfaces** *interface-type-fpc/pic/port:channel*

Sample Output

```
user@host> monitor interfaces so-0/0/0:1.0
host                                Seconds: 10          Time: 00:23:13
                                  Delay: 0/0/32
Interface: so-0/0/0:1.0, Enabled, Link is Up
Flags: Point-To-Point SNMP-Traps
Encapsulation: PPP
Local statistics:                              Current delta
  Input bytes:              431244                   [0]
  Output bytes:             432268                   [0]
  Input packets:             35933                   [0]
  Output packets:            36019                   [0]
Remote statistics:
  Input bytes:           0 (0 bps)                   [0]
  Output bytes:          0 (0 bps)                   [0]
  Input packets:         0 (1 pps)                   [0]
  Output packets:        0 (0 pps)                   [0]
Traffic statistics:
  Input bytes:              431244                   [0]
  Output bytes:             432268                   [0]
  Input packets:             35933                   [0]
  Output packets:            36019                   [0]
Protocol: inet, MTU: 4470

user@host> monitor interfaces t1-0/0/0:2:1.0
host                                Seconds: 1           Time: 00:32:07
                                  Delay: 0/0/26
Interface: t1-0/0/0:2:1.0, Enabled, Link is Up
Flags: Point-To-Point SNMP-Traps
Encapsulation: PPP
Local statistics:                              Current delta
  Input bytes:              432028                   [0]
  Output bytes:             433076                   [0]
  Input packets:             35954                   [0]
  Output packets:            36041                   [0]
Remote statistics:
  Input bytes:           0 (0 bps)                   [0]
  Output bytes:          0 (0 bps)                   [0]
  Input packets:         0 (0 pps)                   [0]
  Output packets:        0 (0 pps)                   [0]
Traffic statistics:
  Input bytes:              432028                   [0]
  Output bytes:             433076                   [0]
  Input packets:             35954                   [0]
  Output packets:            36041                   [0]
Protocol: inet, MTU: 1500

user@host> monitor interfaces ds-0/0/0:4:1:1.0
host                                Seconds: 3           Time: 00:36:59
                                  Delay: 0/0/0
Interface: ds-0/0/0:4:1:1.0, Enabled, Link is Up
Flags: Point-To-Point SNMP-Traps
Encapsulation: PPP
Local statistics:                              Current delta
  Input bytes:              432836                   [0]
  Output bytes:             433882                   [0]
```

```
  Input packets:              36065                [0]
  Output packets:             36152                [0]
Remote statistics:
  Input bytes:                0 (0 bps)            [0]
  Output bytes:               0 (0 bps)            [0]
  Input packets:              0 (0 pps)            [0]
  Output packets:             0 (0 pps)            [0]
Traffic statistics:
  Input bytes:                432836               [0]
  Output bytes:               433882               [0]
  Input packets:              36065                [0]
  Output packets:             36152                [0]
Protocol: inet, MTU: 1500
```

What It Means The sample output shows common interface failures, indicates whether loopback is detected, and shows increases in framing errors. Use information from this command to help narrow down possible causes of an interface problem.

NOTE: If you are accessing the router from the console connection, make sure you set the CLI terminal type using the set cli terminal command.

CAUTION: We recommend that you use this command only for diagnostic purposes. Do not leave it on during normal router operations because real-time monitoring of traffic consumes additional CPU and memory resources.