

## Chapter 13

# Configuring Channelized OC3 IQ Interfaces

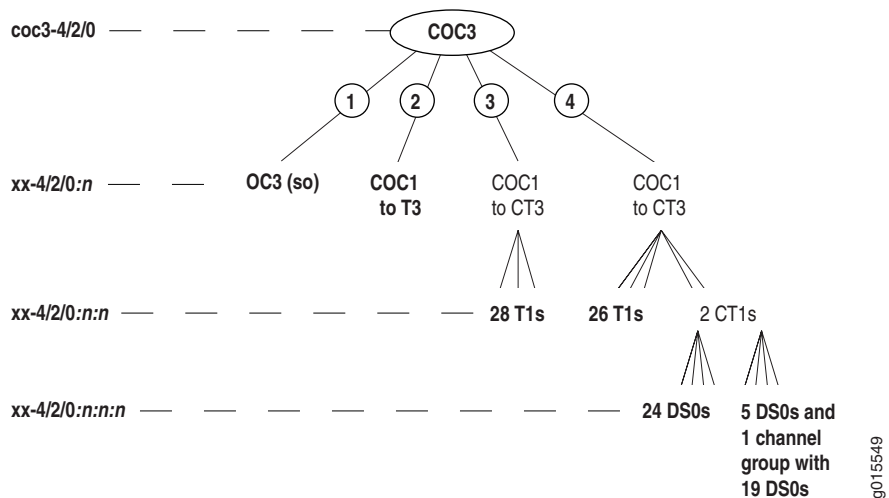
Channelized intelligent queuing (IQ) interfaces allow arbitrary and dynamic channelization of serial links, allowing greater flexibility than regular channelized interfaces.

On a Channelized OC3 IQ PIC, you can configure the following interface types:

- One OC3 SONET/SDH interface
- Up to three T3 interfaces
- Up to 84 T1 interfaces
- Up to 336 NxDS0 interfaces on an M-series platform
- Up to 768 NxDS0 interfaces on a T-series platform

Figure 19 shows an example of how a Channelized OC3 PIC might be partitioned. In the figure, the OC3 SONET interface would be a standalone interface because it would use the entire bandwidth of the PIC.

**Figure 19: Channelized OC3 IQ Interface Example for Show Interfaces Controller**



You can configure the following encapsulation types:

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

For more information about interface encapsulation, see “Configuring Interface Encapsulation” on page 74 and page 115.

To configure channelized interfaces, include the following statements at the [edit interfaces interface-name] hierarchy level:

```
[edit interfaces interface-name]  
no-partition interface-type type;  
partition partition-number oc-slice oc-slice-range interface-type type;  
partition partition-number timeslots time-slot-range interface-type type;
```

This chapter describes how to configure interfaces on a Channelized OC3 IQ PIC, discussing the following topics:

- Partitions, OC Slices, Interface Types, and Time Slots on page 291
- Configuring a Clear Channel on page 291
- Configuring T3 IQ Interfaces on page 292
- Configuring T1 and NxDS0 Interfaces on page 293
- Configuring Fractional T1 IQ Interfaces on page 297

## Partitions, OC Slices, Interface Types, and Time Slots

The partition number is the sublevel interface partition index and is correlated with the channel number. For channelized OC3 interfaces, you can configure up to three OC1 interfaces, so the partition number can be 1, 2, or 3. For channelized T3 interfaces (**ct3**), you can configure multiple interfaces at once by including a partition range, such as 1-3. This creates three T1 interfaces with channel numbers 1 through 3.



**NOTE:** For channelized IQ interfaces, channel numbering begins with 1 (:1). For regular channelized interfaces, channel numbering begins with 0 (:0).

You configure the OC-slice range for SONET/SDH interfaces only. The OC-slice range is correlated with the bandwidth size required for the interface type you are configuring. For example, a channelized OC3 interface (**coc3**) can be divided into three OC1 interfaces, each containing one OC slice. Therefore the OC-slice value must be 1, 2, or 3.

The configurable interface types are dependent on the hierarchy level at which you include the **interface-type** and **partition** or **no-partition** statements. For example, when you include the **no-partition** statement at the `[edit interfaces coc3-fpc/pic/port]` hierarchy level, the only configurable interface type is **so**, because the **no-partition** statement signals that you are creating a clear-channel SONET/SDH interface. When you include the **partition** statement at the `[edit interfaces coc1-fpc/pic/port]` hierarchy level, the configurable interface types are **ct1** or **t1**. If you want to create a T1 interface, include the **t1** option. If you want to further channelize down to the NxDS0 level, include the **ct1** option as an intermediate step before dividing the channelized T1 interface (**ct1**) into NxDS0 interfaces.

You configure time slots for fractional T1 interfaces and NxDS0 interfaces. You can configure ranges by using hyphens. You can configure discontinuous time slots by using commas. Do not include spaces.

### Configuring a Clear Channel

A *clear channel* is an interface that uses the entire bandwidth of the PIC. To configure a clear channel, include the **no-partition** and **interface-type** statements in the configuration.

On a 1-port Channelized OC3 IQ PIC, you can configure one OC3 clear-channel interface. To configure an OC3 interface, include the **no-partition** and **interface-type** statements at the `[edit interfaces coc3-fpc/pic/port]` hierarchy level:

```
[edit interfaces coc3-fpc/pic/port]
no-partition interface-type so;
```

This configuration creates interface `so-fpc/pic/port`. When you include the **no-partition** statement at the `[edit interfaces coc3-fpc/pic/port]` hierarchy level, the only configurable interface type is **so**, because the **no-partition** statement signals that you are creating a clear-channel SONET/SDH interface.

## Configuring T3 IQ Interfaces

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To configure a T3 interface on an OC3 PIC, include the `partition`, `oc-slice`, and `interface-type` statements at the `[edit interfaces coc3-fpc/pic/port]` hierarchy level, specifying the `coc1` interface type:

```
[edit interfaces coc3-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type coc1;
```

When you include the `partition` statement at the `[edit interfaces coc3-fpc/pic/port]` hierarchy level, the only configurable interface type is `coc1`. This configuration creates interface `coc1-fpc/pic/port:channel`.



The channelized OC1 IQ interface, configured on the Channelized OC12 IQ PIC, does not support class of service (CoS).

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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`.

### Example: Configuring T3 IQ Interfaces

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

```
[edit interfaces coc3-1/1/0]
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 Feature Guide*.

## Configuring T1 and NxDS0 Interfaces

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To configure T1 interfaces on a Channelized OC3 IQ PIC, you perform the following tasks:

1. Partition the channelized OC3 interface into channelized OC1 interfaces by including the **partition**, **oc-slice**, and **interface-type** statements at the `[edit interfaces coc3-fpc/pic/port]` hierarchy level, specifying the **coc1** interface type:

```
[edit interfaces coc3-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:channel]` hierarchy level, specifying the **t1** interface type:

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

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:

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



The channelized T3 IQ interface, configured on the Channelized DS3 IQ PIC or Channelized OC12 IQ PIC, does not support class of service (CoS).

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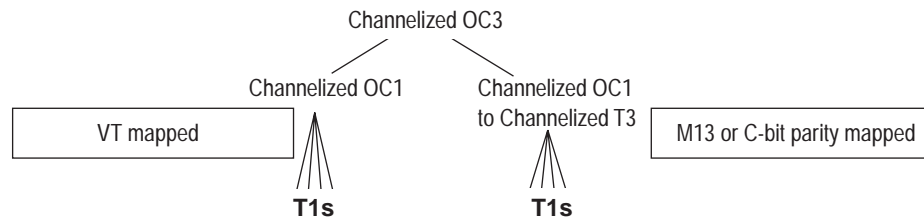
Note that because the **no-partition** statement is included, this configuration does not create another level of channelization, as denoted by the number of colons in the resulting interface.

To configure T1 interfaces, partition the channelized T3 interface into T1 interfaces by specifying the **t1** interface type:

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

Figure 20 shows VT-mapped and M13 or C-bit parity-mapped configurations of T1 IQ interfaces.

**Figure 20: T1 Interfaces on a Channelized OC3 PIC**



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

To configure *N*xDS0 interfaces, partition the channelized T3 interface into channelized T1 interfaces by specifying the **ct1** interface type:

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



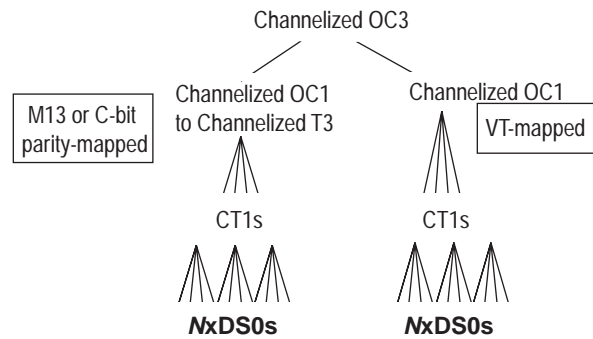
The channelized T1 IQ interface, configured on the Channelized DS3 IQ PIC or Channelized OC12 IQ PIC, does not support class of service (CoS).

3. Configure channelized *N*xDS0 IQ interfaces on the channelized T1 IQ 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 21 shows VT-mapped and M13 or C-bit parity-mapped configurations of NxDS0 IQ interfaces.

**Figure 21: Sample Channelization of OC3 IQ PIC**



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

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### Examples: Configuring T1 and NxDS0 IQ 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 coc3-0/0/0]
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 coc3-0/0/0]
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;

```

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

```

ds-0/0/0:1:2:1
ds-0/0/0:1:2:2

```

#### VT-Mapped Configuration

```

[edit interfaces coc3-0/0/0]
partition 1 oc-slice 1 interface-type coc1;

```

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

```
[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 12-16 interface-type ds;
```

```
[edit interfaces coc3-0/0/0]
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 12-16 interface-type ds;
```

For a full configuration example, see the *JUNOS Feature Guide*.

**Setting Remote Loopback and Running BERT Tests on NxDS0 Interfaces**

For Channelized OC3 IQ PICs, if you need remote loopback on a far-end NxDS0 interface, and you are running a BERT test from the local NxDS0 interface, you must set remote loopback on the far-end router's associated Channelized T1 interface (ct1). To do this, include the `loopback remote` statement at the `[edit interfaces ct1-fpc/pic/port t1-options]` hierarchy level. For example:

Local router:

```
[edit interfaces]
ct1-0/0/0:2:2 {
  partition 1 timeslots 1-10 interface-type ds;
  ds-0/0/0:2:2:1 {
    ds0-options {
      bert-period 30;
    }
  }
}
```

Remote router:

```
[edit interfaces]
ct1-0/0/0:2:2 {
  partition 1 timeslots 1-10 interface-type ds;
  t1-options {
    loopback remote;
  }
}
```

## Configuring Fractional T1 IQ Interfaces

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By default, all the time slots on a channelized T1 interface are used. To configure a fractional T1 interface on a Channelized OC3 IQ PIC, you must perform the following tasks:

1. Configure a T1 interface on the Channelized OC3 IQ PIC. For more information, see “Configuring T1 and NxDS0 Interfaces” on page 293.
2. Configure the number of time slots allocated to the T1 IQ 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 IQ 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” on page 555.

### Example: Configuring Fractional T1 IQ Interfaces

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

```
[edit interfaces coc3-0/0/0]
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 Feature Guide*.

