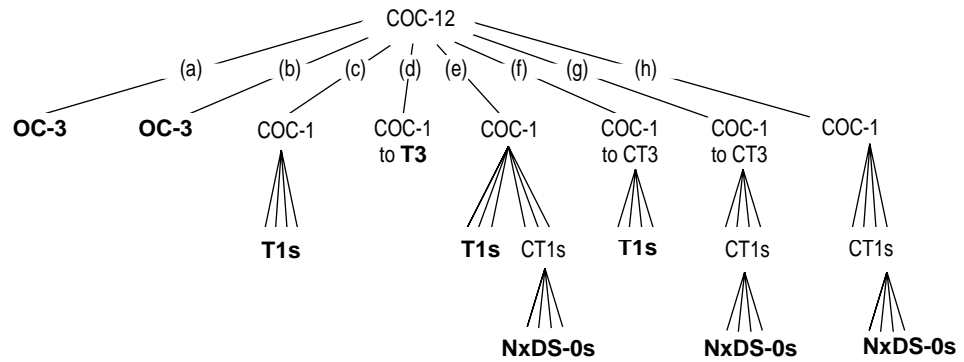


# Chapter 14

## Configure Channelized OC-12 Interfaces

Channelized QPP interfaces allow arbitrary and dynamic channelization of serial links, allowing greater flexibility than the channelized interfaces. For example, each Channelized OC-12 PIC with QPP is capable of supporting a full OC-12 interface or can be channelized into four OC-3 data channels, 12 T3 data channels, 336 T1 data channels, or 336 DS-0 data channels, or any combination of T1, T3, and  $N \times DS-0$ , up to 336 channels. By comparison, the Channelized OC-12 PIC supports only 12 T3 channels. Figure 16 and Figure 13 on page 184 illustrate the difference in flexibility between a Channelized OC-12 PIC with QPP and an Channelized OC-12 PIC.

**Figure 12: Sample Channelization of OC-12 PIC with QPP**



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

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In Figure 16, a Channelized OC-12 PIC with QPP is partitioned into the following OC slices:

- An OC-3 interface.
- Another OC-3 interface.
- A Channelized OC-1 partitioned into T1 interfaces.
- A Channelized OC-1 converted into a T3 interface.
- A Channelized OC-1 partitioned into T1 interfaces and Channelized T1s, which are partitioned into  $N \times DS-0$  interfaces.
- A Channelized OC-1 converted into a Channelized T3, which is partitioned into T1 interfaces.

- g. A Channelized OC-1 converted into a Channelized T3, which is partitioned into into T1 interfaces and a Channelized T1, which is partitioned into NxDS-0 interfaces.
- h. A Channelized OC-1 partitioned into Channelized T1s, which are partitioned into NxDS-0 interfaces.

This is one of thousands of ways to configure a Channelized OC-12 PIC with QPP. To configure the interfaces shown in Figure 16, see “Example: Configure Channelized OC-12 QPP Interfaces” on page 199.

**Figure 13: Sample Channelization of OC-12 PIC**

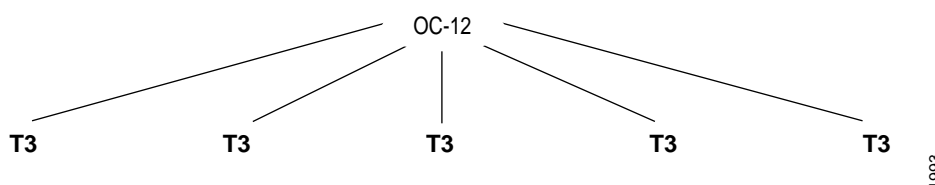


Figure 2 shows five T3 channels configured on the Channelized OC-12 PIC. You can configure seven additional T3 channels. For more information about configuring Channelized OC-12 PICs, see “Configure Channelized OC-12 Interfaces” on page 183. To create the interfaces shown in Figure 13, see “Configure Aggregated SONET/SDH Interfaces” on page 380.

This chapter is organized as follows:

- Configure Channelized OC-12 QPP Interfaces on page 184
- Configure Channelized OC-12 QPP Interface Properties on page 192
- Configure Channelized OC-12 Interfaces on page 198

For examples of Channelized OC-12 interface configuration, see the following sections:

- Example: Configure Channelized OC-12 QPP Interfaces on page 199
- Example: Configure Channelized OC-12 Interfaces on page 203

## Configure Channelized OC-12 QPP Interfaces

This section describes how to configure Channelized OC-12 QPP interfaces, discussing the following topics:

- Configure an OC-12 QPP Interface on page 185
- Configure T3 QPP Interfaces on page 185
- Configure OC-3 QPP Interfaces on page 186
- Configure T1 QPP Interfaces on page 187
- Configure NxDS-0 QPP Channels on page 189
- Configure Fractional T1 QPP Interfaces on page 191

## Configure an OC-12 QPP Interface

On a one-port Channelized OC-12 PIC with QPP, you can configure one OC-12 interface. To configure an OC-12 interface, include the no-partition statement at the [edit interfaces coc12-fpc/pic/port] hierarchy level:

```
[edit interfaces coc12-fpc/pic/port]
no-partition;
```

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

## Configure T3 QPP Interfaces

On a Channelized OC-12 PIC with QPP, you can configure up to 12 T3 interfaces.

To configure a T3 interface on an OC-12 PIC, include the partition, oc-slice, and interface-type statements at the [edit interfaces coc12-fpc/pic/port] hierarchy level, specifying the coc1 interface type:

```
[edit interfaces coc12-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 correlates with the channel number. For Channelized OC-1 interfaces, the partition number can be in the range 1 through 12.



**Note**

For Channelized OC-12 interfaces, channel numbering begins with 0 (:0). For Channelized OC-12 QPP 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 OC-1 interfaces, the OC slice can be in the range 1 through 12. You can configure only one OC slice per Channelized OC-1 interface.

The interface type is the channelized interface type or clear channel you are creating. For Channelized OC-12 interfaces, type can be so or coc1.

**Example: Configure T3 QPP Interfaces**

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

```
[edit interfaces coc12-1/1/0]
partition 3 oc-slice 3 interface-type coc1;
```

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

**Configure OC-3 QPP Interfaces**

On a Channelized OC-12 PIC with QPP, you can configure up to four OC-3 QPP interfaces. To configure an OC-3 QPP interface, include the partition, oc-slice, and interface-type statements at the [edit interfaces coc12-fpc/pic/port] hierarchy level, specifying the so interface type:

```
[edit interfaces coc12-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 OC-3 interfaces, the partition number can be 1 through 4.

**Note**

For Channelized OC-12 QPP interfaces, channel numbering begins with 1 (:1). This is unlike Channelized OC-12 interfaces, for which channel numbering begins with 0 (:0).

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. OC-3 QPP interfaces must occupy three consecutive OC slices per interface, in one of the following forms:

1-3

4-6

7-9

10-12

By contrast, the T3 and OC-1 QPP interfaces each occupy one OC slice per interface.

The interface type is the channelized interface type or data channel you are creating. For Channelized OC-12 interfaces, the interface type can be coc1 or so.

**Example: Configure OC-3 QPP Interfaces**

Configure an OC-3 interface, using partition 1 and OC slices 4 through 6. This configuration creates interface so-1/1/0:1.

```
[edit interfaces coc12-1/1/0]
partition 1 oc-slice 4-6 interface-type so;
```

**Configure T1 QPP Interfaces**

On a Channelized OC-12 PIC with QPP, you can configure up to 336 T1 interfaces. To configure T1 interfaces on a Channelized OC-12 PIC with QPP, you perform the following tasks:

1. Partition the Channelized OC-12 interface into Channelized OC-1 interfaces by including the partition, oc-slice, and interface-type statements at the [edit interfaces coc12-*fpc/pic/port*] hierarchy level, specifying the coc1 interface type:

```
[edit interfaces coc12-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type coc1;
```

2. If your network equipment is M13 or C-bit parity mapped, you partition the Channelized OC-1 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 is VT mapped, you convert the Channelized OC-1 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;
```

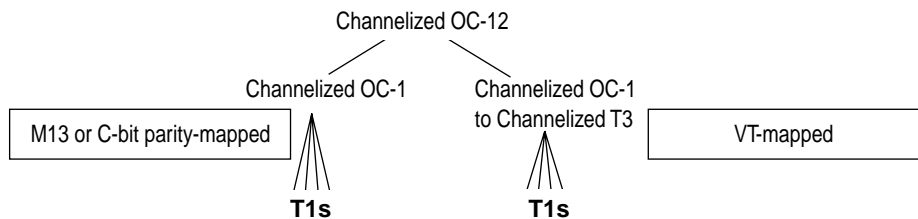
Note that because the no-partition statement is included, this configuration does not create another level of channelization, as denoted by the number of colons in the resulting interface.

You then 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;
```

Figure 14 shows VT-mapped and M13- or C-bit parity-mapped configurations of T1 QPP channels.

Figure 14: Configure T1 Interfaces on a Channelized OC-12 PIC



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

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**Example: Configure T1 QPP 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 coc12-0/0/0]
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 coc12-0/0/0]
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 NxDS-0 QPP Channels

On a Channelized OC-12 PIC with QPP, you can configure up to 336 NxDS-0 channels. To configure NxDS-0 interfaces on a Channelized OC-12 PIC with QPP, you perform the following tasks:

1. Partition the Channelized OC-12 interface into Channelized OC-1 interfaces by including the partition, oc-slice, and interface-type statements at the [edit interfaces coc12-fpc/pic/port] hierarchy level, specifying the coc1 interface type:

```
[edit interfaces coc12-fpc/pic/port]
partition partition-number oc-slice oc-slice-range interface-type coc1;
```

2. If your network equipment is M13 or C-bit parity mapped, you partition the Channelized OC-1 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;
```

If your network equipment is VT mapped, you convert the Channelized OC-1 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;
```

Note that 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.

You then 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:

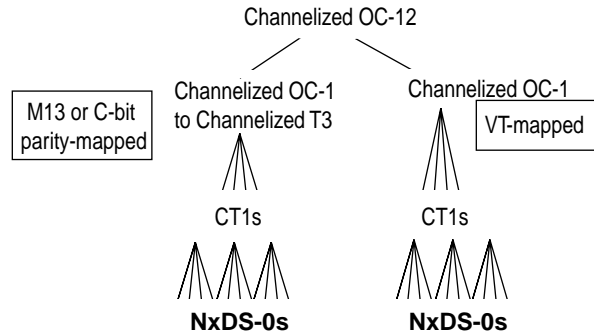
```
[edit interfaces ct3-fpc/pic/port:channel]
partition partition-number interface-type ct1;
```

3. Configure Channelized NxDS-0 QPP interfaces on the Channelized T1 QPP 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 15 shows VT-mapped and M13- or C-bit parity-mapped configurations of NxDS-0 QPP channels.

Figure 15: Configure NxDS-0 Interfaces on a Channelized OC-12 PIC



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

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**Example: Configure an NxDS-0 QPP Interface**

Configure the following two NxDS-0 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 coc12-0/0/0]
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 12-16 interface-type ds;
```

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

```
[edit interfaces coc12-0/0/0]
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;
```

## Configure Fractional T1 QPP Interfaces

On a Channelized OC-12 PIC with QPP, you can configure up to 336 fractional T1 interfaces. To configure a fractional T1 interface on a Channelized OC-12 PIC with QPP, you must perform the following tasks:

1. Configure a T1 QPP interface. For more information, see “Configure T1 QPP Interfaces” on page 187:

This configuration creates interface `t1-fpc/pic/port:channel:channel`.

2. Configure the number of time slots allocated to the T1 QPP 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 QPP interfaces, the time-slot range is 1 through 24. You can designate any combination of time slots for usage. The default is to use all the time slots. For more information about T1 time slots, see “Configure Fractional T1 Time Slots” on page 394.

### Example: Configure Fractional T1 QPP Interfaces

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

```
[edit interfaces coc12-0/0/0]
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 1-10;
```

## Configure Channelized OC-12 QPP Interface Properties

This section lists the interface properties that are valid at each channel level on a Channelized OC-12 QPP interface, discussing the following topics:

Specify Options at the Channelized OC-12 QPP Level on page 192

Specify Options at the Channelized OC-1 QPP Level on page 193

Specify Options at the Channelized T3 QPP Level on page 194

Specify Options at the Channelized T1 QPP Level on page 194

Specify Options at the T3 QPP Interface Level on page 195

Specify Options at the T1 QPP Interface Level on page 196

Specify Options at the NxDS-0 QPP Interface Level on page 197

For more information, see “Channelized QPP Interface Properties” on page 169.

### **Specify Options at the Channelized OC-12 QPP Level**

To specify options at the Channelized OC-12 interface level, include the following statements at the [edit interfaces coc12-fpc/pic/port] hierarchy level:

```
[edit interfaces coc12-fpc/pic/port]
clocking clock-source;
disable;
description text;
no-partition;
partition partition-number oc-slice oc-slice-range interface-type type;
sonet-options {
  aps {
    advertise-interval milliseconds;
    authentication-key key;
    force;
    hold-time milliseconds;
    lockout;
    neighbor address;
    paired-group group-name;
    protect-circuit group-name;
    request;
    revert-time seconds;
    working-circuit group-name;
  }
  bytes {
    sonet-header-byte-options;
  }
  loopback (local | remote);
  (zO-increment | no-zO-increment);
}
traceoptions {
  flag flag <flag-modifier> <disable>;
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39 and “Configure SONET/SDH Interfaces” on page 359.

For OC-12 and OC-3 SONET/SDH QPP interfaces (*so-fpc/pic/port* and *so-fpc/pic/port:[1-4]*), all physical interface properties and SONET/SDH interface properties are valid, except SONET link aggregation, receive bucket, and transmit bucket which are ignored if configured.

### **Specify Options at the Channelized OC-1 QPP Level**

To specify options at the Channelized OC-1 interface level, include the following statements at the [edit interfaces coc1-*fpc/pic/port:channel*] hierarchy level:

```
[edit interfaces coc1-fpc/pic/port:channel]
clocking clock-source;
disable;
description text;
no-partition {
    interface-type type;
}
partition partition-number oc-slice oc-slice-range interface-type type;
sonet-options {
    bytes {
        sonet-header-byte-options;
    }
    loopback (local | remote);
    path-trace trace-string;
}
traceoptions {
    flag flag <flag-modifier> <disable>;
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39 and “Configure SONET/SDH Interfaces” on page 359.

## Specify Options at the Channelized T3 QPP Level

To specify options at the Channelized T3 interface level, include the following statements at the [edit interfaces ct3-fpc/pic/port:channel] hierarchy level:

```
[edit interfaces ct3-fpc/pic/port:channel]
clocking clock-source;
disable;
description text;
no-partition;
partition partition-number oc-slice oc-slice-range interface-type type;
t3-options {
  bert-algorithm algorithm;
  bert-error-rate rate;
  bert-period seconds;
  (cbit-parity | no-cbit-parity);
  (feac-loop-respond | no-feac-loop-respond);
  (long-buildout | no-long-buildout);
  loopback (local | payload | remote);
}
traceoptions {
  flag flag <flag-modifier> <disable>;
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39 and “Configure T3 Interfaces” on page 395.

## Specify Options at the Channelized T1 QPP Level

To specify options at the channelized T1 QPP interface level, include the following statements at the [edit interfaces ct1-fpc/pic/port:channel] hierarchy level:

```
[edit interfaces ct1-fpc/pic/port:channel]
clocking clock-source;
disable;
description text;
partition partition-number oc-slice oc-slice-range interface-type type;
t1-options {
  bert-algorithm algorithm;
  bert-error-rate rate;
  bert-period seconds;
  framing (esf | sf);
  line-encoding (ami | b8zs);
  loopback (local | payload | remote);
  remote-loopback-respond;
}
traceoptions {
  flag flag <flag-modifier> <disable>;
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39 and “Configure T3 Interfaces” on page 395.

## Specify Options at the T3 QPP Interface Level

To specify options at the T3 interface level, include the following statements at the [edit interfaces t3-fpc/pic/port:channel] hierarchy level:

```
[edit interfaces t3-fpc/pic/port:channel]
dce;
disable;
description text;
encapsulation type;
hold-time up milliseconds down milliseconds;
keepalives <interval seconds> <down-count number> <up-count number>;
mtu bytes;
no-keepalives;
ppp-options {
  chap {
    access-profile name;
    local-name name;
    passive;
  }
}
t3-options {
  bert-algorithm algorithm;
  bert-error-rate rate;
  bert-period seconds;
  (cbit-parity | no-cbit-parity);
  compatibility-mode (adtran | digital-link | kentrox | larscom | verilink) <subrate value>;
  fcs (32 | 16);
  (feac-loop-respond | no-feac-loop-respond);
  idle-cycle-flag value;
  (long-buildout | no-long-buildout);
  loopback (local | remote);
  (payload-scrambler | no-payload-scrambler);
  start-end-flag (shared | filler);
}
unit logical-unit-number {
  logical-interface-statements;
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39 and “Configure T3 Interfaces” on page 395.

## Specify Options at the T1 QPP Interface Level

To specify options at the T1 interface level, include the following statements at the [edit interfaces t1-fpc/pic/port<:channel>] hierarchy level:

```
[edit interfaces t1-fpc/pic/port<:channel>]
clocking clock-source;
dce;
disable;
description text;
encapsulation type;
hold-time up milliseconds down milliseconds;
keepalives <interval seconds> <down-count number> <up-count number>;
lmi {
  lmi-type (ansi | itu);
  n391dte number;
  n392dce number;
  n392dte number;
  n393dce number;
  n393dte number;
  t391dte seconds;
  t392dce seconds;
}
mtu bytes;
no-keepalives;
ppp-options {
  chap {
    access-profile name;
    local-name name;
    passive;
  }
}
t1-options {
  bert-algorithm algorithm;
  bert-error-rate rate;
  bert-period seconds;
  byte-encoding (nx64 | nx56);
  fcs (32 | 16);
  framing (esf | sf);
  idle-cycle-flag (flags | ones);
  invert-data;
  line-encoding (ami | b8zs);
  loopback (local | payload | remote);
  start-end-flag (shared | filler);
  remote-loopback-respond;
  timeslots time-slot-range;
}
traceoptions {
  flag flag <flag-modifier> <disable>;
}
(traps | no-traps);
unit logical-unit-number {
  logical-interface-statements;
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39 and “Configure T1 Interfaces” on page 387.

## Specify Options at the NxDS-0 QPP Interface Level

To specify options at the NxDS-0 interface level, include the following statements at the [edit interfaces ds-fpc/pic/port<:channel>] hierarchy level:

```
[edit interfaces ds-fpc/pic/port<:channel>]
  accounting-profile name;
  dce;
  disable;
  description text;
  ds0-options {
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    byte-encoding (nx64 | nx56);
    fcs (32 | 16);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback (payload | remote);
    start-end-flag (shared | filler);
  }
  encapsulation type;
  hold-time up milliseconds down milliseconds;
  keepalives <down-count number> <interval seconds> <up-count number>;
  lmi {
    lmi-type (ansi | itu);
    n391dte number;
    n392dce number;
    n392dte number;
    n393dce number;
    n393dte number;
    t391dte seconds;
    t392dce seconds;
  }
  mtu bytes;
  no-keepalives;
  ppp-options {
    chap {
      access-profile name;
      local-name name;
      passive;
    }
  }
  traceoptions {
    flag flag <flag-modifier> <disable>;
  }
  (traps | no-traps);
  unit {
    logical-interface-statements;
  }
}
```

For more information about specific parameters, see “Configure Physical Interface Properties” on page 39.

## Configure Channelized OC-12 Interfaces

On Channelized OC-12 PICs, you can configure 12 T3 channels per port. To configure Channelized OC-12 interface properties, you can include the `sonet-options` and `t3-options` statements at the `[edit interfaces interface-name]` hierarchy level. Some SONET options are ignored, and some can only be configured for channel 0, though they apply equally to all channels. The `long-buildout` statement under `t3-options` is also ignored.

For T3 channels on a Channelized OC-12 interface, the clocking statement is supported only for channel 0; it is ignored if included in the configuration of channels 1 through 11. The clock source configured for channel 0 applies to all channels on the Channelized OC-12 interface. The individual T3 channels use a gapped 45-MHz clock as the transmit clock. When you configure the clock source for a channelized interface—`ds-x/y/z:0`, for example—you must also include the `channel-group` statement at the `[edit chassis]` hierarchy level, and specify channel group 0. For more information, see “Clock Sources on Channelized Interfaces” on page 166.

For more information, see “Configure SONET/SDH Interfaces” on page 359, and “Configure T3 Interfaces” on page 395. For a configuration example, see “Configure Aggregated SONET/SDH Interfaces” on page 380.

Table 19 summarizes the OC-12 to DS-3 numbering scheme.

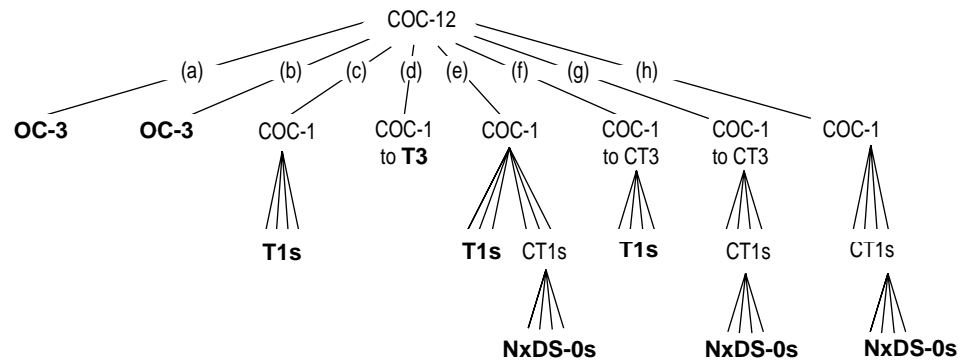
**Table 19: OC-12 to DS-3 Numbering Scheme**

Two-Level STS-1 Number (STS-3, STS-1)	One-Level STS Number	OC-12 to DS-3 PIC DS-3 Number
1,1	1	0
1,2	2	1
1,3	3	2
2,1	4	3
2,2	5	4
2,3	6	5
3,1	7	6
3,2	8	7
3,3	9	8
4,1	10	9
4,2	11	10
4,3	12	11

## Example: Configure Channelized OC-12 QPP Interfaces

In Figure 16, a Channelized OC-12 PIC with QPP is partitioned into multiple OC slices.

**Figure 16: Sample Channelization of OC-12 PIC with QPP**



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

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Figure 16 shows the following OC slices:

- a. An OC-3 interface.
- b. Another OC-3 interface.
- c. A Channelized OC-1 partitioned into T1 interfaces.
- d. A Channelized OC-1 converted into a T3 interface.
- e. A Channelized OC-1 partitioned into T1 interfaces and Channelized T1s, which are partitioned into NxDS-0 interfaces.
- f. A Channelized OC-1 converted into a Channelized T3, which is partitioned into T1 interfaces.
- g. A Channelized OC-1 converted into a Channelized T3, which is partitioned into into T1 interfaces and a Channelized T1, which is partitioned into NxDS-0 interfaces.
- h. A Channelized OC-1 partitioned into Channelized T1s, which are partitioned into NxDS-0 interfaces.

The following example shows how to configure cases (a) through (h):

```
[edit interfaces]
coc12-1/1/0 {
  sonet-options {
    sonet-options-statements;
  }
  partition 1 oc-slice 1-3 interface-type so; # (a) so-1/1/0:1.
  partition 2 oc-slice 4-6 interface-type so; # (b) so-1/1/0:2
  partition 3 oc-slice 7 interface-type coc1; # (c) coc1-1/1/0:3
  partition 4 oc-slice 8 interface-type coc1; # (d) coc1-1/1/0:4
  partition 5 oc-slice 9 interface-type coc1; # (e) coc1/1/0:5
  partition 6 oc-slice 10 interface-type coc1; # (f) coc1-1/1/0:6
  partition 7 oc-slice 11 interface-type coc1; # (g) coc1-1/1/0:7
  partition 8 oc-slice 12 interface-type coc1; # (h) coc1-1/1/0:8
}

so-1/1/0:1 {
  description "(a) oc-slice 1-3 of coc12-1/1/0. COC12 > OC3.";
  sonet-options {
    sonet-options-statements;
  }
}

so-1/1/0:2 {
  description "(b) oc-slice 4-6 of coc12-1/1/0. COC12 > OC3.";
  sonet-options {
    sonet-options-statements;
  }
}

coc1-1/1/0:3 {
  description "(c) oc-slice 7 of coc12-1/1/0. COC12 to COC-1 VT-mapped to T1s.";
  sonet-options {
    sonet-options-statements;
  }
  partition 1 - 10 interface-type t1; # t1-1/1/0:[1-10]
}

t1-1/1/0:3:1 {
  description "(c) oc-slice 7 of coc12-1/1/0. T1 interface config.";
  t1-options {
    t1-options-statements;
  }
}

...

coc1-1/1/0:4 {
  description "(d) oc-slice 8 of coc12-1/1/0. COC12 to COC-1 converted to a T3.";
  sonet-options {
    sonet-options-statements;
  }
  no-partition interface-type t3; # t3-1/1/0:4
}

t3-1/1/0:4 {
  description "(d) oc-slice 8 of coc12-1/1/0. T3 interface config.";
}
}
```

```

coc1-1/1/0:5 {
  description "(e) oc-slice 9 of coc12-1/1/0. COC12 to COC-1 VT-mapped to T1s.";
  sonet-options {
    sonet-options-statements;
  }
  partition 1 - 3 interface-type t1; # t1-1/1/0:5:[1-3]
  partition 4 interface-type ct1; # ct1-1/1/0:5:4
}
t1-1/1/0:5:1 {
  description "(e) oc-slice 9 of coc12-1/1/0. T1 interface config.";
  t1-options {
    t1-options-statements;
  }
}
...
ct1-1/1/0:5:4 {
  description "(e) oc-slice 9 of coc12-1/1/0. CT1 to NxDS-0s.";
  t1-options {
    t1-options-statements;
  }
  partition 1 timeslots 0 - 10 interface-type ds0; # ds-1/1/0:5:4:1
  partition 2 timeslots 11- 23 interface-type ds0; # ds-1/1/0:5:4:2
  ...
}

coc1-1/1/0:6 {
  description "(f) oc-slice 10 of coc12-1/1/0. COC12 to COC-1 converted to a CT3 to T1s.";
  sonet-options {
    sonet-options-statements;
  }
  no-partition interface-type ct3; # ct3-1/1/0:6
}
ct3-1/1/0:6 {
  description "(f) COC12 to CT3 M-13 and C-bit parity-mapped to T1s.";
  sonet-options {
    sonet-options-statements;
  }
  partition 1 - 10 interface-type t1; # t1-1/1/0:6:[1-10]
}
t1-1/1/0:6:1 {
  description "(f) T1 interface config.";
  t1-options {
    t1-options-statements;
  }
}
...

coc1-1/1/0:7 {
  description "(g) oc-slice 11 of coc12-1/1/0. COC12 to COC-1 converted to a CT3 to T1s
and CT1 to NxDS-0s.";
  sonet-options {
    sonet-options-statements;
  }
  no-partition interface-type ct3; # ct3-1/1/0:7
}

```

```

ct3-1/1/0:7 {
  description "(g) COC12 to CT3 M-13 and C-bit parity-mapped to T1s and CT1.";
  sonet-options {
    sonet-options-statements;
  }
  partition 1 - 10 interface-type t1; # t1-1/1/0:7:[1-10]
  partition 2 interface-type ct1; # ct1-1/1/0:7:11
}
t1-1/1/0:7:1 {
  description "(g) T1 interface config.";
  t1-options {
    t1-options-statements;
  }
}
...
ct1-1/1/0:7:11 {
  description "(g) CT1 to NxDS-Os.";
  t1-options {
    t1-options-statements;
  }
  partition 1 timeslots 0 - 10 interface-type ds0; # ds-1/1/0:7:11:1
  partition 2 timeslots 11- 23 interface-type ds0; # ds-1/1/0:7:11:2
  ...
}

coc1-1/1/0:8 {
  description "(h) oc-slice 12 of coc12-1/1/0. COC12 to COC-1 VT-mapped to CT1 to
NxDS-Os.";
  sonet-options {
    sonet-options-statements;
  }
  partition 1 interface-type t1; # ct1-1/1/0:8:1
}
ct1-1/1/0:8:1 {
  description "(h) CT1 to NxDS-Os.";
  t1-options {
    t1-options-statements;
  }
  partition 1 timeslots 0 - 10 interface-type ds0; # ds-1/1/0:8:1:1
  partition 2 timeslots 11- 23 interface-type ds0; # ds-1/1/0:8:1:2
  ...
}

```

## Example: Configure Channelized OC-12 Interfaces

The following configuration is sufficient to get the Channelized OC-12 interface up and running. The OC-12 interface can be divided into 12 channels. DS-3 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 {
    dci 100;
    family inet {
      address 10.11.30.9/30;
    }
    family iso;
  }
}
```

```
    unit 1 {
      dlc1 101;
      family inet {
        address 10.11.31.9/30;
      }
      family iso;
    }
  }
  t3-fpc/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;
      dlc1 1000;
    }
    unit 1 {
      encapsulation frame-relay-ccc;
      dlc1 1001;
    }
  }
}
```