

Chapter 11

Configure Channelized Interfaces

Juniper Networks routers support two types of channelized interfaces, described in the following sections of this chapter:

Configure Channelized DS-3 Interfaces on page 121

Configure Channelized OC-12 Interfaces on page 125

Configure Channelized DS-3 Interfaces

To configure Channelized DS-3 interface properties, you can include both the t1-options and t3-options statements. Only a subset of the T3 options is valid for this configuration, and the buildout, invert-data, and line-encoding statements under t1-options are ignored; the following configuration lists all the valid parameters.

To specify options for the T3 side of the connection, include the following statement at the [edit interfaces *interface-name*] hierarchy:

```
[edit interfaces interface-name]  
t3-options {  
  bert-algorithm algorithm;  
  bert-error-rate rate;  
  bert-period seconds;  
  (cbit-parity | no-cbit-parity);  
  (feac-loop-respond | no-feac-loop-respond);  
  loopback (local | remote);  
}
```

To specify options for each of the T1 channels, include the following statement at the [edit interfaces *interface-name*] hierarchy:

```
[edit interfaces interface-name]  
t1-options {  
  byte-encoding (nx64 | nx56);  
  fcs (32 | 16);  
  framing (sf | esf);  
  idle-cycle-flag (flags | ones);  
  loopback (local | remote);  
  start-end-flag (shared | filler);  
  timeslots slot-number;  
}
```

For more information about specific parameters, see “Configure E1 and T1 Physical Interface Properties” on page 40 and “Configure E3 and T3 Physical Interface Properties” on page 45. For a configuration example, see “Example: Configure Channelized DS-3 Interfaces” on page 122.

Channelized DS-3 Interface Naming

You can configure 28 T1 channels per T3 interface, and each interface can have logical interfaces. To specify the channel number, include it after the colon (:) in the interface name. For example, a four-port T1 PIC in FPC 1 and slot 1 will have the following physical interfaces, depending on the media type:

```
t1-1/1/0:x
t1-1/1/1:x
t1-1/1/2:x
t1-1/1/3:x
```

x is a channel number ranging from 0 through 27.

Example: Configure Channelized DS-3 Interfaces

The following configuration is sufficient to get the Channelized DS-3 interface up and running. The T3 interface can be divided into 28 channels, each at T1 line rate. DS-3 channels can use PPP, Frame Relay, or Cisco HDLC encapsulation for their logical interfaces; however, each DS-3 channel can support a maximum of 64 Frame Relay data link connection identifiers (DLCIs), numbered from 0 to 63. For more information, see “Configure Frame Relay DLCIs” on page 67.

Configure Cisco HDLC encapsulation on a Channelized DS-3 interface:

```
[edit interfaces]
t1-2/0/1:20 {
  encapsulation cisco-hdlc;
  unit 0 {
    family inet {
      address 20.0.4.40/32 {
        destination 20.0.4.41;
      }
    }
  }
}
```

Configure PPP encapsulation on a Channelized DS-3 interface:

```
[edit interfaces]
t1-2/0/1:20 {
  encapsulation ppp;
  unit 0 {
    family inet {
      address 20.0.4.40/32 {
        destination 20.0.4.41;
      }
    }
  }
}
```

Configure five Frame Relay DLCIs on a Channelized DS-3 interface:

```
[edit interfaces]
t1-5/1/3:0 {
  mtu 9192;
  encapsulation frame-relay;
  unit 1 {
    dlc1 1;
    family inet {
      mtu 9000;
      address 10.123.1.2/32 {
        destination 10.123.1.1;
      }
    }
    family iso {
      mtu 9000;
    }
    family mpls {
      mtu 9000;
    }
  }
  unit 2 {
    dlc1 2;
    family inet {
      mtu 9000;
      address 10.123.1.4/32 {
        destination 10.123.1.3;
      }
    }
    family iso {
      mtu 9000;
    }
    family mpls {
      mtu 9000;
    }
  }
  unit 3 {
    dlc1 3;
    family inet {
      mtu 9000;
      address 10.123.1.6/32 {
        destination 10.123.1.5;
      }
    }
    family iso {
      mtu 9000;
    }
    family mpls {
      mtu 9000;
    }
  }
  unit 4 {
    dlc1 4;
    family inet {
      mtu 9000;
      address 10.123.1.8/32 {
        destination 10.123.1.7;
      }
    }
  }
}
```

```

    family iso {
      mtu 9000;
    }
    family mpls {
      mtu 9000;
    }
  }
  unit 5 {
    dlc1 5;
    family inet {
      mtu 9000;
      address 10.123.1.10/32 {
        destination 10.123.1.9;
      }
    }
    family iso {
      mtu 9000;
    }
    family mpls {
      mtu 9000;
    }
  }
}

```

Configure Cisco HDLC encapsulation with byte-encoding:

```

[edit interfaces t1-1/1/0:1]
no-keepalives;
encapsulation cisco-hdlc;
t1-options {
  byte-encoding nx56;
}
unit 0 {
  family inet {
    address 10.221.2.8/24;
  }
}

```

Configure Cisco HDLC encapsulation with byte-encoding and framing:

```

[edit interfaces t1-1/1/0:1]
no-keepalives;
encapsulation cisco-hdlc;
t1-options {
  byte-encoding nx56;
  framing sf;
}
unit 0 {
  family inet {
    address 10.221.2.8/24;
  }
}

```

Configure Channelized OC-12 Interfaces

To configure Channelized OC-12 interface properties, you can include the `sonet-options` and `t3-options` statements. Some of the 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 more information, see “Configure SONET/SDH Physical Interface Properties” on page 53 and “Configure E3 and T3 Physical Interface Properties” on page 45. You can configure twelve channels per interface, and each interface can have logical interfaces. For a configuration example, see “Example: Configure Channelized OC-12 Interfaces” on page 125.

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, each at T3 line rate. DS-3 channels can use PPP, Frame Relay, or Cisco HDLC encapsulation. The channels can also have logical interfaces.

```
[edit]
user@host# edit interfaces t3-fpc/pic/port:0
[edit interfaces t3-fpc/pic/port:0]
user@host# set encapsulation cisco-hdlc
[edit interfaces t3-fpc/pic/port:0]
user@host# set t3-options compatibility-mode larscom payload-scrambler
[edit interfaces t3-fpc/pic/port:0]
user@host# edit unit 0
[edit interfaces t3-fpc/pic/port:0 unit 0]
user@host# set family inet address 10.11.30.1/30
user@host# set family iso
user@host# top
[edit]
user@host# edit interfaces t3-fpc/pic/port:1
[edit interfaces t3-fpc/pic/port:1]
user@host# set encapsulation ppp
user@host# set t3-options compatibility-mode larscom payload-scrambler
user@host# edit unit 0
[edit interfaces t3-fpc/pic/port:1 unit 0]
user@host# set family inet address 10.11.30.5/30
user@host# set family iso
user@host# top
[edit]
user@host# edit interfaces t3-fpc/pic/port:2
[edit interfaces t3-fpc/pic/port:2]
user@host# set encapsulation frame-relay
[edit interfaces t3-fpc/pic/port:2]
user@host# set t3-options compatibility-mode larscom payload-scrambler
user@host# edit unit 0
[edit interfaces t3-fpc/pic/port:2 unit 0]
user@host# set dlci 100
user@host# set family inet address 10.11.30.9/30
user@host# set family iso
user@host# up
[edit interfaces t3-fpc/pic/port:2]
user@host# edit unit 1
[edit interfaces t3-fpc/pic/port:2 unit 1]
user@host# set dlci 101
user@host# set family inet address 10.11.31.9/30
user@host# set family iso
user@host# up
```

```

[edit interfaces t3-fpc/pic/port:2]
user@host# up
[edit]
user@host# edit interfaces t3-fpc/pic/port:3
[edit interfaces t3-fpc/pic/port:3]
user@host# set encapsulation cisco-hdlc-ccc
user@host# set t3-options compatibility-mode larscom payload-scrambler
user@host# up
[edit]
user@host# edit interfaces t3-fpc/pic/port:4
[edit interfaces t3-fpc/pic/port:4]
user@host# set encapsulation ppp-ccc
user@host# set t3-options compatibility-mode larscom payload-scrambler
user@host# up
[edit]
user@host# edit interfaces t3-fpc/pic/port:5
[edit interfaces t3-fpc/pic/port:5]
user@host# set dce
user@host# set encapsulation frame-relay-ccc
user@host# set t3-options compatibility-mode larscom payload-scrambler
user@host# edit unit 0
[edit interfaces t3-fpc/pic/port:5 unit 0]
user@host# set encapsulation frame-relay-ccc
user@host# set dlci 1000
user@host# up
[edit interfaces t3-fpc/pic/port:5]
user@host# edit unit 1
[edit interfaces t3-fpc/pic/port:5 unit 1]
user@host# set encapsulation frame-relay-ccc
user@host# set dlci 1001
user@host# top
[edit]
user@host# show
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;
  }
}
t3-1fpc/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;
  }
}
}

```

