

# Chapter 12

## Configure E1 Interfaces

E1 is a standard WAN digital communication format designed to operate over copper facilities at a rate of 2.048 Mbps. Widely used outside North America, it is a basic time division multiplexing scheme used to carry digital circuits. The following standards apply to E1 interfaces:

ITU-T Recommendation G.703, *Physical/electrical characteristics of hierarchical digital interfaces*, describes data rates and multiplexing schemes for the E series.

ITU-T Recommendation G.751, *General Aspects of Digital Transmission Systems: Terminal Equipment*, describes framing methods.

ITU-T Recommendation G.775, *Loss of Signal (LOS) and Alarm Indication Signal (AIS) Defect Detection and Clearance Criteria*, describes alarm reporting methods.



**Note**

The Juniper Networks E1 PIC does not support Channel Associated Signaling (CAS).

To configure E1-specific physical interface properties, include the e1-options statement at the [edit interfaces *interface-name*] hierarchy level:

```
[edit interfaces interface-name]  
e1-options {  
  fcs (32 | 16);  
  framing (g704 | unframed);  
  idle-cycle-flag (flags | ones);  
  loopback (local | remote);  
  start-end-flag (shared | filler);  
  timeslots slot-number;  
}
```

You can configure the following E1-specific properties:

Configure the E1 Frame Checksum on page 130

Configure E1 Framing on page 130

Configure E1 Loopback Capability on page 131

Configure E1 Idle Cycle Flag on page 131

Configure E1 Start-End Flag on page 132

Configure E1 Timeslots on page 132

See also the following properties, which apply to a number of different interfaces:

Configure the Media MTU on page 30

Configure the Clock Source on page 35

Configure Receive and Transmit Leaky Bucket Properties on page 36

## Configure the E1 Frame Checksum

By default, the E1 interface supports a 16-bit checksum. You can configure a 32-bit checksum, which provides more reliable packet verification. However, some older equipment might not support 32-bit checksums.

To configure a 32-bit checksum, include the `fcs 32` statement at the [edit interfaces *interface-name* e1-options] hierarchy level:

```
[edit interfaces interface-name e1-options]
fcs 32;
```

To return to the default 16-bit frame checksum, delete the `fcs 32` statement from the configuration:

```
[edit]
user@host# delete interfaces e1-fpc/pic/port e1-options fcs 32
```

To explicitly configure a 16-bit checksum, include the `fcs 16` statement at the [edit interfaces *interface-name* e1-options] hierarchy level:

```
[edit interfaces interface-name e1-options]
fcs 16;
```

## Configure E1 Framing

By default, E1 interfaces use the G704 framing mode. You can configure the alternative unframed mode if needed.

To have the interface use the unframed mode, include the framing statement at the [edit interfaces *interface-name* e1-options] hierarchy level, specifying the unframed option:

```
[edit interfaces interface-name e1-options]
framing unframed;
```

To explicitly configure G704 framing, include the framing statement at the [edit interfaces *interface-name* e1-options] hierarchy level, specifying the `g704` option:

```
[edit interfaces interface-name e1-options]
framing g704;
```

## Configure E1 Idle Cycle Flag

By default, an E1 interface transmits the value 0x7E in the idle cycles. To have the interface transmit the value 0xFF (all ones) instead, include the `idle-cycle-flag` statement at the [edit interfaces *interface-name* e1-options] hierarchy level, specifying the `ones` option:

```
[edit interfaces interface-name e1-options]
idle-cycle-flag ones;
```

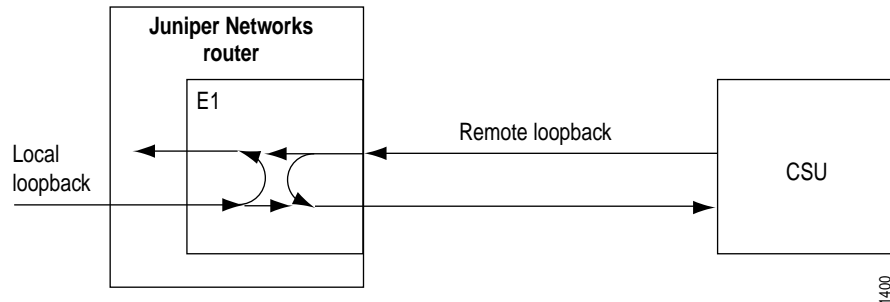
To explicitly configure the default value of 0x7E, include the `idle-cycle-flag` statement with the `flags` option:

```
[edit interfaces interface-name e1-options]
idle-cycle-flag flags;
```

## Configure E1 Loopback Capability

You can configure loopback capability between the local E1 interface and the remote CSU. You can configure the loopback to be local or remote. With local loopback, the E1 interface can transmit packets to the CSU, but receives its own transmission back again and ignores data from the CSU. With remote loopback, packets sent from the CSU are received by the E1 interface but also are immediately retransmitted to the CSU (see Figure 9).

**Figure 9: Remote and Local E1 Loopback**



To configure loopback capability on an E1 interface, include the `loopback` statement at the [edit interfaces *interface-name* e1-options] hierarchy level. Packets can be looped on either the local router or the remote CSU.

```
[edit interfaces interface-name e1-options]
loopback (local | remote);
```

To turn off loopback, remove the `loopback` statement from the configuration:

```
[edit]
user@host# delete interfaces e1-fpc/pic/port e1-options loopback
```

## Configure E1 Start-End Flag

By default, an E1 interface waits two idle cycles between sending start and end flags. To configure the interface to share the transmission of start and end flags, include the `start-end-flag` statement at the [edit interfaces *interface-name* e1-options] hierarchy level, specifying the `shared` option. This configuration can result in better performance on the interface.

```
[edit interfaces interface-name e1-options]
start-end-flag shared;
```

To explicitly configure the default of waiting two idle cycles between the start and end flags, include the `idle-cycle-flag` statement with the `filler` option:

```
[edit interfaces interface-name e1-options]
start-end-flag filler;
```

## Configure E1 Timeslots

To configure the number of timeslots allocated to the interface, include the `timeslots` statement at the [edit interfaces *interface-name* t1-options] hierarchy level, specifying the *slot-number*. The range is 1 through 32 for E1 interfaces.

```
[edit interfaces interface-name e1-options]
timeslots slot-number;
```

There are 32 timeslots on an E1 interface. You can designate any combination of timeslots for usage. The default is to use all the timeslots.

To use timeslots 1 through 10, designate *slot-number* as follows:

```
[edit interfaces interface-name e1-options]
timeslots 1-10;
```

To use timeslots 1 through 5, timeslot 10, and timeslot 24, designate *slot-number* as follows:

```
[edit interfaces interface-name e1-options]
timeslots 1-5,10,24;
```

To use the first four odd-numbered timeslots, designate *slot-number* as follows:

```
[edit interfaces interface-name e1-options]
timeslots 1,3,5,7;
```

Note that spaces are not allowed in specifying timeslot numbers.