

Chapter 16

Configuring T3/E3 and T1/E1 Modules

This chapter describes how to configure the following T3/E3 and T1/E1 modules:

- CT3, CT1, CE1
- T3 (DS3), E3

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Overview

E-series routers can route traffic, such as IP/Frame Relay, IP/PPP, or IP/ATM, on higher-speed uplink modules into the core of the Internet. T3/E3 and T1/E1 line modules pair with I/O modules to provide particular capabilities and connections.

For complete module details, see Table 52 and the *ERX Module Guide*.

Table 52: T3/E3 and T1/E1 Line Modules and I/O Modules

| Line Module | I/O Module | Description | NMC-RX Software Reference Name |
|-------------|------------|--|--------------------------------|
| CE1 | CE1 FULL | 20-port E1 module that supports channelization to DS0 | CE1-20 port |
| COCX-F3 | CT3/T3 12 | 12-port unchannelized T3 module for frame operation | T3 FRAME-12 port |
| CT1 | CT1 FULL | 24-port E1 module that supports channelization to DS0 | CT1-24 port |
| CT3 | CT3/T3 | 3-port T3 module that supports channelization to T1 and DS0 | CT3-3 port |
| CT3/T3-F0 | CT3/T3 12 | 12-port T3 module that supports both channelized operation (T1 and DS0) and unchannelized T3 operation | CT3-12 port |

Table 52: T3/E3 and T1/E1 Line Modules and I/O Modules (continued)

| Line Module | I/O Module | Description | NMC-RX Software Reference Name |
|--------------|------------|--|--------------------------------|
| E3 ATM | E3 | 3-port unchannelized E3 module for ATM | E3 ATM-3 port |
| E3 FRAME | E3 | 3-port unchannelized E3 module for frame operation | E3 FRAME-3 port |
| OCx/STMx ATM | 4xDS3 ATM | 4-port unchannelized E3 module for ATM operation | T3 ATM-4 port |
| T3 ATM | CT3/T3 | 3-port unchannelized T3 module for ATM operation | T3 ATM-3 port |
| T3 FRAME | CT3/T3 | 3-port unchannelized T3 module for frame operation | T3 FRAME-3 port |

The channelized and unchannelized modules described in this chapter are physically different; however, they are configured in similar ways.

Configuration Tasks

Typically, you configure channelized or unchannelized modules in the following order. Some steps may not apply for a particular module.

1. Set the parameters that provide basic identification and status information about the module.
2. Set the line interface parameters.
3. Set the DS1 interface parameters.
4. Configure the DS0 bundle parameters. (See *Chapter 14, Configuring DS0 Bundles*.)
5. Configure the:
 - ATM interfaces (see *Chapter 18, Configuring ATM*)
 - Bridged IP/1483 interfaces (see *Chapter 20, Configuring Bridged IP*)
 - Cisco HDLC interfaces (see *Chapter 23, Configuring Cisco HDLC*)
 - Frame Relay interfaces (see *Chapter 24, Configuring Frame Relay*)
 - IP interfaces (see *NMC-RX User Guide, Vol. 2, Chapter 6, Configuring IP*)
 - MLPPP bundles (see *Chapter 25, Configuring MLPPP Bundles*)
 - PPP interfaces (see *Chapter 27, Configuring PPP*)
 - PPPoE interfaces (see *Chapter 28, Configuring PPP over Ethernet*)

Configuring a Module

You can configure the admin status for a module only by enabling or disabling it.

To change the admin status:

1. In the Instance Explorer list, select the module that you want to configure.
2. Right-click, and select Configure.

The Module Config tab appears in the work area.

3. Select the admin status (Table 53).

Table 53: Module Configuration Parameters (CT3, T3, and E3)

| Field | Description |
|-------------------|---|
| Module Type | Module type (cannot edit) |
| Admin Status | <ul style="list-style-type: none"> ■ Enabled—Module is running ■ Disabled—Module is not in operation |
| Serial Number | Ten-digit identification number (S/N) on the face plate of the module. This value is automatically retrieved from the device, and you cannot edit it. |
| IOA Serial Number | Ten-digit identification number (S/N) on the face plate of the input/output adapter. This value is automatically retrieved from the device, and you cannot edit it. |

4. Click Save.

Configuring a Line Interface

You can configure line interfaces on CT3, T3, and E3 line modules. CT1 and CE1 line modules do not have line interfaces.

To configure a line interface:

1. In the Instance Explorer, select the line interface that you want to configure.
2. Right-click, and select Configure.

The Config tab appears in the work area.



NOTE: Fields vary depending on the type of CT3, T3, and E3 line module that you are configuring. (See the following examples and Table 54 on page 201.)

The screenshot shows the 'CT3 Config' dialog box. At the top, there are 'Save' and 'Lower Layer' buttons. The dialog is titled 'CT3 Config'. Under 'Location:', there are two text boxes: 'Physical' containing 'Module: CT3-3 port, Slot: 2, Port: 0' and 'Logical' which is empty. Below this, there are four dropdown menus: 'Admin Status' set to 'Down', 'Framing Type' set to 'C-Bit Parity', 'Transmit Clock' set to 'Local Timing', and 'Loopback Mode' set to 'None'. At the bottom, there is a text box for 'Length(meters):' with the value '0'.

CT3 line module

The screenshot shows the 'E3 Config' dialog box. At the top, there are 'Save' and 'Lower Layer' buttons. The dialog is titled 'E3 Config'. Under 'Location:', there are two text boxes: 'Physical' containing 'Module: E3 FRAME-3 port, Slot: 8, Port: 0' and 'Logical' which is empty. Below this, there are four dropdown menus: 'Admin Status' set to 'Down', 'Framing Type' set to 'Framed', 'Transmit Timing' set to 'Received Timing', and 'Loopback Mode' set to 'None'. At the bottom, there is an 'HDLC Settings' section with a checked box for 'CRC Checking Enabled', an unchecked box for 'Data Inversion', and a 'CRC Algorithm' section with radio buttons for '16 Bit' (selected) and '32 Bit'. Below these are text boxes for 'MTU:' and 'MRU:' both set to '1600'.

E3 Frame line module

The screenshot shows the 'T3 Config' window with the following settings:

- Location: Physical: Module: T3 FRAME-3 port, Slot: 3, Port: 0
- Admin Status: Down
- Framing Type: M23
- Transmit Timing: Received Timing
- Loopback Mode: None
- Length(meters): 0
- DSU Settings: Mode: None, Bandwidth Limit: 0, Scramble Mode:
- HDLG Settings: CRC Checking Enabled: , Data Inversion: , CRC Algorithm: 16 Bit (selected), 32 Bit
- MTU: 1600, MRU: 1600

T3 Frame line module

3. Set the line interface parameters (Table 54).

Table 54: Line Interface Parameters (CT3, T3, and E3)

| Parameter | Description | CT3 | T3 ATM | T3 FRAME | E3 ATM | E3 FRAME |
|-----------------|--|-----|--------|----------|--------|----------|
| Admin Status | <ul style="list-style-type: none"> ■ Up—Interface is enabled by the administrator ■ Down—Interface is disabled by the administrator | X | X | X | X | X |
| Transmit Timing | Specifies the type of timing: <ul style="list-style-type: none"> ■ Local Timing—System receives its clocking from an internal source ■ Module Timing—System receives its clocking from a network source ■ Chassis Timing—System receives its clocking from the configured system clock | X | X | X | X | X |
| Length (meters) | Specifies the cable length. The length of cable determines power requirements: <ul style="list-style-type: none"> ■ 0 to 224—Use for low-power output ■ 225 to 450—Use for high-power output | X | - | X | - | - |
| Framing Type | <ul style="list-style-type: none"> ■ M23—M23 multiplexer framing ■ M23Plcp—M23 with PLCP framing ■ C-Bit Parity—C-bit parity framing ■ CbitParityPlcp—C-bit parity with PLCP framing ■ G832—G.832 ATM direct mapping ■ Framed—Framed mode ■ PLCP—PLPC framing | X | X | X | - | - |
| | | - | X | - | - | - |
| | | X | X | X | - | - |
| | | - | X | - | - | - |
| | | - | - | - | X | X |
| | | - | - | - | X | X |
| | | - | - | - | X | - |

Table 54: Line Interface Parameters (CT3, T3, and E3) (continued)

| Parameter | Description | CT3 | T3 ATM | T3 FRAME | E3 ATM | E3 FRAME |
|-------------------------------------|--|-----|-----------|-------------|-----------|-------------|
| Loopback Mode | <ul style="list-style-type: none"> ■ None—No loopback specified (default) ■ Network Payload—Loops the data toward the network ■ Network Line—Sets a local loopback at the payload controllers ■ Local—Loops back outgoing data from the transmit to the receive side | x | x | - | x | x |
| Cell Scramble | Enables cell scrambling on the interface | - | x | - | x | - |
| DSU Settings | | | | | | |
| Mode | None, Larscom, Digital Link | - | - | x | - | - |
| Bandwidth Limit | Range: 0–44210 | - | - | x | - | - |
| Scramble Mode | Enables cell scrambling on the interface | - | - | x | - | - |
| HDLC Settings | | | | | | |
| CRC Checking Enabled | Enables cyclic redundancy check (CRC), an error-checking technique that uses a calculated numeric value to detect errors in transmitted data | - | - | x | - | x |
| CRC Algorithm | Cyclic redundancy check algorithm used during error checking (16 bit or 32 bit) | - | - | x | - | x |
| Data Inversion | Enables data stream inversion for the interface | - | - | x | - | x |
| MTU | Maximum transmission unit size for the interface. Coordinate this value with the network administrator on the other end of the line; default 1500 | - | - | x | - | x |
| MRU | Maximum receive unit size for the interface. Coordinate this value with the network administrator on the other end of the line; default 1500 | - | - | x | - | x |
| (x = parameter available on module) | | | | | | |

4. Click Save.

Your configuration settings are saved.

Configuring a DS1 Interface

You can configure DS1 interfaces on CT3, CT1, and CE1 line modules.

- CT3 modules are made up of three DS3 line interfaces. Each DS3 line interface multiplexes 28 asynchronous T1 (DS1) channels.
- CT1 modules have 24 T1 channels
- CE1 modules have 20 E1 channels

To configure a DS1 interface:

1. In the Instance Explorer, navigate to the DS1 level.
2. Select the DS1 interface that you want to configure, right-click, and select Configure.

The DS1 Config tab appears in the work area.

3. Set the DS1 configuration parameters (Table 55).

Table 55: DS1 Configuration Parameters

| Field | Description |
|----------------|--|
| Name | Identifier for the interface; generated automatically |
| Alias | Description of the interface; 0–15 characters; default: blank |
| IfIndex | Identifier for the interface on a particular line interface; generated automatically |
| Operational | Current operational status of the interface |
| Administrative | Desired status of the interface: Up/Down; default: Up |
| Framing Type | <ul style="list-style-type: none"> ■ ESF—T1 framing for extended superframes (ESF) (default) ■ SF—T1 framing for superframes (SF) ■ CRC4—Cyclic redundancy check (CE1 only) ■ no CRC4—(CE1 only) |

Table 55: DS1 Configuration Parameters (continued)

| Field | Description |
|----------------------------|---|
| Transmit Clock | <ul style="list-style-type: none"> ■ Received Timing—Sets the clock source on the active line ■ Module Timing—Receives its clocking from a network source ■ Chassis Timing—Receives its clocking from the configured system clock |
| Operation Mode | Specifies the type of controller (DS1): <ul style="list-style-type: none"> ■ T1—T1 and CT3 modules only ■ E1—E1 module only (Europe) ■ J1—T1 module only; J1 variant of the T1 framing (Japan) |
| Line Coding | <ul style="list-style-type: none"> ■ AMI—Specifies alternate mark inversion; default ■ B8ZS—Specifies bipolar with eight-zero substitution; T1 and CT3 modules only ■ HDB3—Specifies high-density bipolar 3 line-code type; E1 module only (Europe) |
| Loopback Mode | <ul style="list-style-type: none"> ■ None—No loopback specified; default ■ Network Payload—Loops the data toward the network ■ Network Line—Sets a local loopback at the payload controllers ■ Local—Loops back outgoing data from the transmit to the receive side |
| DS0 Bundle Time Slots | <ul style="list-style-type: none"> ■ Time slots 1–24 (CT3 and CT1) or 1–31 (CE1) ■ An X indicates preallocated DS0 bundle timeslots on the T1 line interface selected |
| Allocated Bandwidth (kbps) | <ul style="list-style-type: none"> ■ Displays the total amount of allocated bandwidth |

4. Click Save.

You can now create DS0 interfaces on the DS1 interface. See *Chapter 14, Configuring DS0 Bundles*.