



Clear Channel T3/E3 with Integrated CSU/DSU

This chapter describes how to implement the Clear Channel T3/E3 with Integrated CSU/DSU feature. The feature delivers Clear Channel service as a T3/E3 pipe with bandwidth of 28x24x64k for T3 or 16x32x64 for E3. The software-configurable T3/E3 network module allows you to switch between T3 and E3 applications with a single Cisco IOS command.

The T3/E3 NM-1 network module supports a single-port T3 or E3 with an integrated channel service unit (CSU) and a data service unit (DSU). It supports High-Level Data Link Control (HDLC), PPP, and frame relay. It includes the following features:

- Single port—universal T3/E3 version
- Clear and subrate support on both T3 and E3 modes
- Online insertion and removal (OIR) support on Cisco 3660 series and Cisco 3745 routers
- Onboard processing of Cisco Message Definition Language (MDL) and performance monitoring
- Support for scrambling and subrate can be independently or simultaneously enabled in each DSU mode
- Support for full T3 and E3 line rates

The T3/E3 NM-1 network module provides high-speed performance for advanced, fully converged networks supporting a wide array of applications and services such as security and advanced QoS for voice and video. T3/E3 and subrate T3/E3 connectivity optimizes WAN bandwidth for deploying the new applications and service delivery.

Feature History for Clear Channel T3/E3 with Integrated CSU/DSU

Release	Modification
12.2(11)YT	This feature was introduced.
12.2(15)T	This feature was integrated into this release.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

**Note**

For more information about related Cisco IOS voice features, see the following:

- [“Overview of ISDN Voice Interfaces” on page 3](#)
- Entire Cisco IOS Voice Configuration Library—including library preface and glossary, other feature documents, and troubleshooting documentation—at http://www.cisco.com/en/US/products/ps6441/prod_configuration_guide09186a0080565f8a.html

For a list of references cited in this chapter, see the [“Additional References” section on page 91](#).

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Prerequisites for Clear Channel T3/E3 with Integrated CSU/DSU

- Perform the prerequisites that are listed in the [“Prerequisites for Configuring an ISDN Voice Interface” section on page 15](#).
- Ensure that you have sufficient system memory ([Table 6](#)).

Table 6 Minimum Memory Requirements

Platform	Flash Memory	DRAM Memory
Cisco 2650	8 MB	32 MB
Cisco 2651XM		
Cisco 2691	32 MB	64 MB
Cisco 3660 series	8 MB	64 MB
Cisco 3725	32 MB	128 MB
Cisco 3745	32 MB	128 MB

Restrictions for Clear Channel T3/E3 with Integrated CSU/DSU

Restrictions are described in the [“Restrictions for Configuring ISDN Voice Interfaces” section on page 4](#).

Information About Clear Channel T3/E3 with Integrated CSU/DSU



Note

General information about ISDN voice interfaces is presented in the [“Information About ISDN Voice Interfaces” section on page 4](#).

All supported platforms are capable of supporting line-rate performance, but impose varying levels of CPU overhead and therefore affect overall platform performance. [Table 7](#) shows recommended branch-office positioning.

Table 7 T3/E3 NM-1 Branch Office Positioning and Support Comparison

Platform	Recommended Positioning		Supported T3/E3 Modes
	Type of Service	Branch Office Size	
Cisco 2650	Subrate T3/E3	Small to medium offices	1
Cisco 2651XM			
Cisco 2691	Subrate T3/E3	Small to medium offices	1
Cisco 3660 series	Subrate and full-rate T3/E3	Large and regional offices	1
Cisco 3725	Subrate and full-rate T3/E3	Medium and large offices	1
Cisco 3745	Subrate and full-rate T3/E3	Medium, large, and regional offices	2

How to Configure Clear Channel T3/E3 with Integrated CSU/DSU

This section contains the following procedures:

- [Configuring Clear-Channel T3, page 73](#)
- [Configuring Clear-Channel E3, page 81](#)
- [Verifying Clear-Channel T3/E3, page 88](#)

Configuring Clear-Channel T3

This section contains the following procedures:

- [Configure the Card Type and Controller for T3, page 74](#)
- [Configure DSU Mode and Bandwidth for T3, page 75](#)
- [Configure Encryption Scrambling for T3, page 76](#)
- [Configure a Bit-Error-Rate Test Pattern for T3, page 77](#)
- [Configure Loopback for T3, page 78](#)
- [Configure the Maintenance Data Link for T3, page 80](#)

Configure the Card Type and Controller for T3

To configure the card type and controller for T3, perform the following steps.



Note

- When the clear-channel T3/E3 network module is used for the first time, the running configuration does not show the T3/E3 controller and its associated serial interface. Use the **show version** command to learn if the router recognized the T3/E3 card and was able to initialize the card properly. After the card type is configured for the slot, the respective controller and serial interfaces appear in the running configuration. See the “[Additional References](#)” section on page 91.
- The autoconfig/setup utility does not support configuring the card type for the T3/E3 network module.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **card type t3**
4. **controller t3**
5. **framing**
6. **cablelength**
7. **clock source**
8. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	card type t3 slot Example: Router(config)# card type t3 1	Configures the card type on the T3 controller for the designated slot. Note By default, the T3 controller does not show up in the show running-config output.
Step 4	controller t3 slot/port Example: Router(config)# controller t3 1	Specifies the T3 controller and enters controller configuration mode for the specified slot/port.

	Command or Action	Purpose
Step 5	framing { <i>c-bit</i> <i>m23</i> } Example: Router(config-controller)# framing c-bit	Specifies the T3 framing type. Keywords are as follows: <ul style="list-style-type: none"> • c-bit—C-bit framing • m23—M23 framing
Step 6	cablelength <i>feet</i> Example: Router(config-controller)# cablelength 250	Specifies the distance from the routers to the network equipment.
Step 7	clock source { <i>internal</i> <i>line</i> } Example: Router(config-controller)# clock source line	Selects the clock source. Keywords are as follows: <ul style="list-style-type: none"> • internal—Internal clock source (T3 default) • line—Network clock source (E3 default)
Step 8	exit Example: Router(config-controller)# exit	Exits the current mode.

Configure DSU Mode and Bandwidth for T3

To configure DSU mode and bandwidth for T3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface serial**
4. **dsu mode**
5. **dsu bandwidth**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<code>interface serial slot/port</code> Example: Router(config)# interface serial 1/1	Enters interface configuration mode for the specified slot/port.
Step 4	<code>dsu mode {0 1 2 3 4}</code> Example: Router(config-if)# dsu mode 0	Specifies the interoperability mode used by a T3 controller—that is, to what the T3 controller connects. Keywords are as follows: <ul style="list-style-type: none"> • 0—Another T3 controller or a Digital Link DSU (DL3100) (default) • 1—Kentrox DSU • 2—Larscom DSU • 3—Adtran T3SU 300 • 4—Verilink HDM 2182
Step 5	<code>dsu bandwidth kbps</code> Example: Router(config-if)# dsu bandwidth 44210	Specifies the maximum allowable bandwidth, in kbps. Range: 1 to 44210. Note The real (actual) vendor-supported bandwidth range is 75 to 44210 kbps. See Table 6 on page 72 .
Step 6	<code>exit</code> Example: Router(config-if)# exit	Exits the current mode.

Configure Encryption Scrambling for T3

To configure encryption scrambling for T3, perform the following steps.

SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `interface serial`
4. `scramble`
5. `exit`

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface serial slot/port Example: Router(config)# interface serial 1/1	Enters interface configuration mode for the specified slot/port.
Step 4	scramble Example: Router(config-if)# scramble	Enables the scrambling of the payload. Default: off.
Step 5	exit Example: Router(config-if)# exit	Exits the current mode.

Configure a Bit-Error-Rate Test Pattern for T3

To configure a bit-error-rate test pattern for T3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **controller t3**
4. **bert pattern**
5. **no bert**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	controller t3 slot/port Example: Router(config)# controller t3 1/1	Enters controller configuration mode for the specified slot/port.
Step 4	bert pattern {2^23 2^20 2^15 1s 0s alt-0-1} interval time Example: Router(config-controller)# bert pattern 2^20 interval 10000	Configures a bit-error-rate test pattern. Keywords and arguments are as follows: <ul style="list-style-type: none"> • 2^23—Pseudorandom 0.151 test pattern, 8,388,607 bits long • 2^20—Pseudorandom 0.153 test pattern, 1,048,575 bits long • 2^15—Pseudorandom 0.151 test pattern, 32,768 bits long • 1s—Repeating pattern of ones (...111...) • 0s—Repeating pattern of zeros (...000...) • alt-0-1—Repeating pattern of alternating zeros and ones (...01010...) • interval time—Duration of the BER test, in minutes.
Step 5	no bert Example: Router(config-controller)# no bert	Disables the BERT test pattern.
Step 6	exit Example: Router(config-controller)# exit	Exits the current mode.

Configure Loopback for T3

To configure loopback for T3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**

3. **controller t3**
4. **loopback**
5. **no loopback**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	controller t3 slot/port Example: Router(config)# controller t3 1/1	Enters controller configuration mode for the specified slot/port.
Step 4	loopback {local network {line payload} remote} Example: Router(config-controller)# loopback local	Loops the T3 line toward the line and back toward the router. Keywords are as follows: <ul style="list-style-type: none"> • local—Loops the data back toward the router and sends an alarm-indication signal (AIS) out toward the network. On a dual port card, it is possible to run channelized on one port and primary rate on the other port. • network {line payload}—Sets loopback toward the network before going through the framer (line) or after going through the framer (payload). • remote—Sends a far-end alarm control (FEAC) request to the remote end requesting that it enter into a network line loopback. FEAC requests (and therefore remote loopbacks) are possible only when the T3 is configured for C-bit framing. M23 format does not support remote loopbacks.
Step 5	no loopback Example: Router(config-controller)# no loopback	Removes the loop.
Step 6	exit Example: Router(config-controller)# exit	Exits the current mode.

Configure the Maintenance Data Link for T3

To configure the maintenance data link for T3, perform the following steps.



Note

This configuration information is applicable only to C-bit parity T3.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **controller t3**
4. **mdl**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	controller t3 slot/port Example: Router(config)# controller t3 1/1	Enters controller configuration mode for the specified slot/port.

	Command or Action	Purpose
Step 4	<pre>mdl {transmit {path idle-signal test-signal} string {eic lic fic unit pfi port generator} string}</pre> <p>Example: Router(config-controller)# mdl transmit path</p>	<p>Configures the MDL message. Keywords and arguments are as follows:</p> <ul style="list-style-type: none"> • transmit path—Enables transmission of the MDL path message. • transmit idle-signal—Enables transmission of the MDL idle signal message. • transmit test-signal—Enables transmission of the MDL test signal message. • string eic string—Equipment identification code (EIC); can be up to 10 characters. • string lic string—Location identification code (LIC); can be up to 11 characters. • string fic string—Frame identification code (FIC); can be up to 10 characters. • string unit string—Unit identification code (UIC); can be up to 6 characters. • string pfi string—Facility identification code (PFI) sent in the MDL path message; can be up to 38 characters. • string port string—Port number string sent in the MDL idle signal message; can be up to 38 characters. • string generator string—Generator number string sent in the MDL test signal message; can be up to 38 characters.
Step 5	<pre>exit</pre> <p>Example: Router(config-controller)# exit</p>	<p>Exits the current mode.</p>

Configuring Clear-Channel E3

This section contains the following procedures:

- [Configure the Card Type and Controller for E3, page 82](#)
- [Configure DSU Mode and Bandwidth for T3, page 75](#)
- [Configure Encryption Scrambling for E3, page 84](#)
- [Configure a Bit-Error-Rate Test Pattern for E3, page 85](#)
- [Configure Loopback for E3, page 86](#)
- [Configure the National Bit in the G.751 Frame for E3, page 87](#)

Configure the Card Type and Controller for E3

To configure the card type and controller for E3, perform the following steps.



Note

The autoconfig/setup utility does not support configuring the card type for the T3/E3 network module.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **card type e3**
4. **controller e3**
5. **framing**
6. **clock source**
7. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	card type e3 slot Example: Router(config)# card type e3 1	Configures the card type on the E3 controller for the designated slot. Note By default, the E3 controller does not show up in the show running-config output.
Step 4	controller e3 slot/port Example: Router(config)# controller e3 1	Enters controller configuration mode for the specified slot/port.
Step 5	framing {bypass g751} Example: Router(config-controller)# framing bypass	Specifies the framing type. Keywords are as follows: <ul style="list-style-type: none"> • bypass—G.751 framing is bypassed • g751—G.751 is the E3 framing type (default)

	Command or Action	Purpose
Step 6	<pre>clock source {internal line}</pre> <p>Example: Router(config-controller)# clock source line</p>	Selects the clock source. Keywords are as follows: <ul style="list-style-type: none"> internal—Internal clock source (T3 default) line—Network clock source (E3 default)
Step 7	<pre>exit</pre> <p>Example: Router(config-controller)# exit</p>	Exits the current mode.

Configure DSU Mode and Bandwidth for E3

To configure DSU mode and bandwidth for E3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface serial**
4. **dsu mode**
5. **dsu bandwidth**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>enable</pre> <p>Example: Router> enable</p>	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	<pre>configure terminal</pre> <p>Example: Router# configure terminal</p>	Enters global configuration mode.
Step 3	<pre>interface serial slot/port</pre> <p>Example: Router(config)# interface serial 1/1</p>	Enters interface configuration mode for the specified slot/port.

	Command or Action	Purpose
Step 4	dsu mode {0 1} Example: Router(config-if)# dsu mode 0	Specifies the interoperability mode used by an E3 controller—that is, to what the E3 controller connects. Keywords are as follows: <ul style="list-style-type: none"> • 0—(default) Another E3 controller or a digital link DSU (DL3100) • 1—Kentrox DSU
Step 5	dsu bandwidth <i>kbps</i> Example: Router(config-if)# dsu bandwidth 34010	Specifies the maximum allowable bandwidth, in kbps. Range: 22 to 34010. Note The real (actual) vendor-supported bandwidth range is 358 to 34010 kbps. See Table 6 on page 72 .
Step 6	exit Example: Router(config-if)# exit	Exits the current mode.

Configure Encryption Scrambling for E3

To configure encryption scrambling for E3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface serial**
4. **scramble**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface serial <i>slot/port</i> Example: Router(config)# interface serial 1/1	Enters interface configuration mode for the specified slot/port.

	Command or Action	Purpose
Step 4	scramble Example: Router(config-if)# scramble	Enables the scrambling of the payload. Default: off.
Step 5	exit Example: Router(config-if)# exit	Exits the current mode.

Configure a Bit-Error-Rate Test Pattern for E3

To configure a bit-error-rate test pattern for E3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **controller t3**
4. **bert pattern**
5. **no bert**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	controller e3 slot/port Example: Router(config)# controller e3 1/0	Enters controller configuration mode for the specified slot/port.

	Command or Action	Purpose
Step 4	<pre>bert pattern {2^23 2^20 2^15 1s 0s alt-0-1} interval time</pre> <p>Example: Router(config-controller)# bert pattern 2^20 interval 1440</p>	<p>Enables a bit-error-rate (BER) test pattern on a T1 or E1 line, and sets the length of the test pattern and duration of the test. Keywords and arguments are as follows:</p> <ul style="list-style-type: none"> • 2^23—Pseudorandom 0.151 test pattern, 8,388,607 bits long • 2^20—Pseudorandom 0.153 test pattern, 1,048,575 bits long • 2^15—Pseudorandom 0.151 test pattern, 32,768 bits long • 1s—Repeating pattern of ones (...111...) • 0s—Repeating pattern of zeros (...000...) • alt-0-1—Repeating pattern of alternating zeros and ones (...01010...) • interval time—Duration of the BER test, in minutes
Step 5	<pre>no bert</pre> <p>Example: Router(config-controller)# no bert</p>	Disables the BER test pattern.
Step 6	<pre>exit</pre> <p>Example: Router(config-controller)# exit</p>	Exits the current mode.

Configure Loopback for E3

To configure loopback for E3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **controller e3**
4. **loopback**
5. **no loopback**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	controller e3 slot/port Example: Router(config)# controller e3 1/1	Enters controller configuration mode for the specified slot/port.
Step 4	loopback {local network {line payload}} Example: Router(config-controller)# loopback local	Loops the E3 line toward the line and back toward the router. Keywords are as follows: <ul style="list-style-type: none"> local—Loops the data back toward the router and sends an AIS signal out toward the network. network {line payload}—Sets loopback toward the network before going through the framer (line) or after going through the framer (payload).
Step 5	no loopback Example: Router(config-controller)# no loopback	Removes the loop.
Step 6	exit Example: Router(config-controller)# exit	Exits the current mode.
Step 7	exit Example: Router(config)# exit	Exits the current mode.

Configure the National Bit in the G.751 Frame for E3

To configure the national bit in the G.751 frame for E3, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **controller e3**
4. **national bit**

5. `exit`

DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code> Example: Router> <code>enable</code>	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	<code>configure terminal</code> Example: Router# <code>configure terminal</code>	Enters global configuration mode.
Step 3	<code>controller e3 slot/port</code> Example: Router(config)# <code>controller e3 1/1</code>	Enters controller configuration mode for the specified slot/port.
Step 4	<code>national bit {1 0}</code> Example: Router(config-controller)# <code>national bit 1</code>	Sets the E3 national bit in the G.751 frame used by the E3 controller. Valid values: 0 and 1. Default: 1.
Step 5	<code>exit</code> Example: Router(config-controller)# <code>exit</code>	Exits the current mode.

Verifying Clear-Channel T3/E3

To verify clear-channel T3/E3, perform the following steps (listed alphabetically).

SUMMARY STEPS

1. `show controllers`
2. `show interfaces serial`
3. `show isdn status`
4. `show running-config`
5. `show version`

DETAILED STEPS

Step 1 `show controllers`

Use this command to display information about the specified port, connector, or interface card number (location of voice module) or slot/port (location of voice network module and VIC).

Step 2 `show interfaces serial`

Use this command to display information about a serial interface.

Step 3 show isdn status

Use this command to display the status of all ISDN interfaces, including active layers, timer information, and switch-type settings.

Step 4 show running-config

Use this command to display basic router configuration.

Step 5 show version

Use this command to display whether the router recognized the T3/E3 card and was able to initialize the card properly. Lists the hardware interfaces and controllers present in the router. You should find “1 Subrate T3/E3 port(s)”.

```
Router# show version

.
.
.
Router uptime is 2 hours, 6 minutes
System returned to ROM by power-on
System image file is "flash:c3725-i-mz"

cisco 3725 (R7000) processor (revision 0.4) with 111616K/19456K bytes of memory.
Processor board ID 12345678901
R7000 CPU at 240Mhz, Implementation 39, Rev 3.3, 256KB L2 Cache
Bridging software.
X.25 software, Version 3.0.0
Primary Rate ISDN software, Version 1.1
2 FastEthernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
2 Channelized T1/PRI port(s)
1 Subrate T3/E3 port(s)
DRAM configuration is 64 bits wide with parity disabled.
55K bytes of non-volatile configuration memory.
15680K bytes of ATA System CompactFlas (Read/Write)

Configuration register is 0x0
```

Troubleshooting Tips

Set Loopbacks

- Use T3/E3 local loopback to ensure that the router and the T3/E3 network module are working properly. The controller clock source should be configured to “internal.”
- Use T3/E3 network loopback and remote loopback to diagnose problems with cables between the T3/E3 controller and the central switching office at the link level. For this diagnostic setup to work, if the network module is looped toward the network, the network module must be configured with the clock source as “line.”

Run Bit Error Rate Test

- The network module contains onboard BERT circuitry. With this circuitry present, the software can send and detect a programmable pattern that is compliant with CCITT/ITU pseudorandom and repetitive test patterns. BERT allows you to test cables and signal problems in the field.

- When a BERT is running, your system expects to receive the same pattern that it is sending. To help ensure this, two common options are available.
 - Use a loopback somewhere in the link or network.
 - Configure remote testing equipment to send the same BERT pattern at the same time.

Configuration Example for Clear Channel T3/E3 with Integrated CSU/DSU

This example shows the running configuration of a router whose E3 (slot1/0) interface is configured to use G.751 framing and a network (line, or network, is the E3 default) clock source. Note that the bandwidth of the interface is configured to 34010 kbps.

```
Router# show running-config

Building configuration...
%AIM slot 0 doesn't exist

Current configuration :1509 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router1
!
card type e3 1
no logging console
!
ip subnet-zero
no ip routing
!
voice call carrier capacity active
!
mta receive maximum-recipients 0
!
controller E3 1/0
  clock source line
  framing g751
  linecode <line code>
  dsu bandwidth 34010
!
interface Loopback0
  no ip address
  no ip route-cache
  shutdown
  no keepalive
!
interface FastEthernet0/0
  ip address 10.0.145.34 255.255.255.0
  no ip route-cache
  no ip mroute-cache
  duplex auto
  speed auto
  no cdp enable
!
interface Serial0/0
  no ip address
```

```
encapsulation ppp
no ip route-cache
no ip mroute-cache
shutdown
clockrate 2000000
no fair-queue
!
interface FastEthernet0/1
no ip address
no ip route-cache
no ip mroute-cache
shutdown
duplex auto
speed auto
no keepalive
no cdp enable
!
interface Serial0/1
no ip address
encapsulation ppp
no ip route-cache
no ip mroute-cache
shutdown
clockrate 2000000
!
interface Serial0/2:0
ip address 172.27.27.2 255.255.255.0
no ip route-cache
no keepalive
!
interface Serial1/0
no ip address
no ip route-cache
no keepalive
dsu bandwidth 34010
!
ip classless
no ip http server
!
ip pim bidir-enable
!
call rsvp-sync
!
mgcp profile default
!
dial-peer cor custom
!
line con 0
exec-timeout 0 0
line aux 0
line vty 0 4
login
!
end
```

Additional References

General ISDN References

- [“ISDN Features Roadmap” on page 1](#)—Describes how to access Cisco Feature Navigator; also lists and describes, by Cisco IOS release, ISDN features for that release

- [“Overview of ISDN Voice Interfaces” on page 3](#)—Describes relevant underlying technology; lists related documents, standards, MIBs, and RFCs; and describes how to obtain technical assistance
- [“Additional References” section on page 64](#)—Lists additional ISDN references