



## Using the Setup Command Facility

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This chapter describes how to use the **setup** command facility to configure your router. The **setup** command facility prompts you to enter information needed to start a router functioning quickly. The facility steps you through a basic configuration, including local-area network (LAN) and wide-area network (WAN) interfaces. The following sections are included:

- [Before Starting Your Router, page 2-1](#)
- [Using the setup Command Facility, page 2-2](#)
- [Configuring Global Parameters, page 2-2](#)
- [Configuring Interface Parameters, page 2-5](#)
- [Completing the Configuration, page 2-23](#)
- [Where to Go Next, page 2-24](#)

If you prefer to configure the router manually or you wish to configure a module or interface that is not included in the **setup** command facility, proceed to “[Chapter 3, “Configuring with the Command-Line Interface,”](#) for step-by-step instructions.

### Before Starting Your Router

Before you power on your router and begin to use the **setup** command facility, make sure you follow these steps:

- 
- Step 1** Set up the hardware as described in the documentation appropriate to your router.
  - Step 2** Configure your PC terminal emulation program for 9600 baud, 8 data bits, no parity, and 1 stop bit.
  - Step 3** Determine which network protocols you are supporting (for example, AppleTalk, IP, Novell IPX, and so on).
  - Step 4** Determine the following for each network protocol:
    - Addressing plan
    - Which WAN protocols you will run on each interface (for example, Frame Relay, HDLC, X.25, and so on)
-

# Using the setup Command Facility

The setup command facility displays from your PC terminal emulation program window.

To create a basic configuration for your router, do the following:

- Complete the steps in the “[Configuring Global Parameters](#)” section on page 2-2.
- Complete the steps in the “[Configuring Interface Parameters](#)” section on page 2-5 that apply to your router and network.
- Complete the steps in the “[Completing the Configuration](#)” section on page 2-23.



## Note

If you make a mistake while using the **setup** command facility, you can exit and run the facility again. Press **Ctrl-c**, and type **setup** at the enable mode prompt (2600#).

## Configuring Global Parameters

**Step 1** Power on the router. The power switch is on the rear panel of the router, at the lower right corner, near the power cord.

Messages will begin to appear in your terminal emulation program window.



## Caution

*Do not press any keys on the keyboard until the messages stop.* Any keys pressed during this time are interpreted as the first command typed when the messages stop, which might cause the router to power off and start over. It takes a few minutes for the messages to stop.

The messages look similar to the following:



## Note

The messages vary, depending on the Cisco IOS software release, interface modules in place in your router, and feature set you select. The screen displays in this section are for reference only and might not exactly reflect the messages on your console.

```
System Bootstrap, Version 11.3(1)XA, PLATFORM SPECIFIC RELEASE SOFTWARE (fc1)
Copyright (c) 1998 by cisco Systems, Inc.
C2600 platform with 32768 Kbytes of main memory
```

```
rommon 1 b f
program load complete, entry point: 0x80008000, size: 0xef4e0
Self decompressing the image : #####
[OK]
```

```
Notice: NVRAM invalid, possibly due to write erase.
program load complete, entry point: 0x80008000, size: 0x415b20
Self decompressing the image :
#####
#####
#####
##### [OK]
```

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Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, California 95134-1706

Cisco Internetwork Operating System Software  
IOS (tm) C2600 Software (C2600-JS-M), Version 11.3(2)XA,  
PLATFORM SPECIFIC RELEASE SOFTWARE (fc1)  
Copyright (c) 1986-1998 by cisco Systems, Inc.  
Compiled Tue 10-Mar-98 14:18 by rnapier  
Image text-base: 0x80008084, data-base: 0x809CD49C

cisco 2611 (MPC860) processor (revision 0x100) with 24576K/8192K bytes of memory.  
Processor board ID 04614954  
M860 processor, part number 0 mask 32  
Bridging software.  
X.25 software, Version 3.0.0.  
2 Ethernet/IEEE 802.3 interface(s)  
3 Serial network interface(s)  
32 terminal line(s)  
DRAM configuration parity is disabled.  
32K bytes of non-volatile configuration memory.  
8192K bytes of processor board System flash (Read/Write)

--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.  
Use ctrl-c to abort configuration dialog at any prompt.  
Default settings are in square brackets '[]'.

**Step 2** When the following message appears, enter **yes** to begin the initial configuration dialog:

Would you like to enter the initial configuration dialog? [yes/no]:



**Note** If you answer **no** to this message, you are prompted to terminate AutoInstall. AutoInstall is a procedure that configures a new router based on the configuration of an existing router.

If you terminate AutoInstall, you enter the Cisco IOS software CLI.



**Note** The interface numbering that appears in the next step is dependent on the type of Cisco modular router platform. This example shows a Cisco 2600 series router.

**Step 3** When the following message appears, press **Return** to see the current interface summary:

First, would you like to see the current interface summary? [yes]:

Any interface listed with OK? value "NO" does not have a valid configuration

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	unassigned	NO	unset	up	up
Serial0/0	unassigned	NO	unset	up	down
BRI0/0	unassigned	NO	unset	up	up

```
Serial0/1      unassigned      NO  unset  up      down
Serial0/2      unassigned      NO  unset  up      down
```

**Step 4** Enter a host name for the router (this example uses 2600):

Configuring global parameters:

```
Enter host name [Router]: 2600
```

The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.

**Step 5** Enter an enable secret password. This password is encrypted (more secure) and cannot be seen when viewing the configuration:

```
Enter enable secret: xxxxx
```

The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.

**Step 6** Enter an enable password that is different from the enable secret password. This password is *not* encrypted (less secure) and can be seen when viewing the configuration:

```
Enter enable password: guessme
```

The virtual terminal password is used to protect access to the router over a network interface.

**Step 7** Enter the virtual terminal password, which prevents unauthenticated access to the router through ports other than the console port:

```
Enter virtual terminal password: guessagain
```

**Step 8** Respond to the following prompts as appropriate for your network:

```
Configure SNMP Network Management? [yes]:
Community string [public]:
Configure LAT? [no]:
Configure AppleTalk? [no]:
Configure DECnet? [no]:
Configure IP? [yes]:
Configure IGRP routing? [yes]:
Your IGRP autonomous system number [1]: 15
```




---

**Note** If you answer **no** to IGRP, you are prompted to configure RIP.

---

```
Configure CLNS? [no]:
Configure IPX? [no]:
Configure Vines? [no]:
Configure XNS? [no]:
Configure Apollo? [no]:
Configure bridging? [no]:
```

**Step 9** Configure the ISDN switch type used by the Basic Rate Interface (BRI) module:

```
BRI interface needs isdn switch-type to be configured
Valid switch types are :
[0] none.....Only if you don't want to configure BRI.
[1] basic-1tr6...1TR6 switch type for Germany
[2] basic-5ess...AT&T 5ESS switch type for the US/Canada
[3] basic-dms100..Northern DMS-100 switch type for US/Canada
[4] basic-net3...NET3 switch type for UK and Europe
[5] basic-ni.....National ISDN switch type
```

```
[6] basic-ts013...TS013 switch type for Australia
[7] ntt.....NTT switch type for Japan
[8] vn3.....VN3 and VN4 switch types for France
Choose ISDN BRI Switch Type [2]:
```

- Step 10** Configure the asynchronous serial lines for the integrated modems on the modules installed in the router. (If you want to allow users to dial in through the integrated modems, you must configure the asynchronous lines.)

Async lines accept incoming modems calls. If you will have users dialing in via modems, configure these lines.

```
Configure Async lines? [yes]:
  Async line speed [115200]:
```



**Note** Cisco recommends that you do not change this speed.

```
Will you be using the modems for inbound dialing? [yes]:
```



**Note** If your asynchronous interfaces will be using the same basic configuration parameters, Cisco recommends answering **yes** to the next prompt. That way, you group the modems so that they can be configured as a group. Otherwise, you will need to configure each interface separately.

```
Would you like to put all async interfaces in a group and configure them all at one time?
[yes]:
```

```
  Allow dial-in users to choose a static IP addresses? [no]:
```

```
  Configure for TCP header compression? [yes]:
```

```
  Configure for routing updates on async links? [no]:
```

```
Enter the starting address of IP local pool? [X.X.X.X]: 172.20.30.40
```



**Note** Make sure the starting and ending addresses of the IP pool are in the same subnet.

```
Enter the ending address of IP local pool? [X.X.X.X]: 172.20.30.88
```

You can configure a test user to verify that your dial-up service is working properly

```
What is the username of the test user? [user]:
```

```
What is the password of the test user? [passwd]:
```

```
Will you be using the modems for outbound dialing? [no]:
```

```
Configuring interface parameters:
```

## Configuring Interface Parameters

From this point on in the **setup** process, the prompts you see vary depending on the network modules and WAN interface cards in place in your router. The following sections provide examples of the setup steps for each interface module. Refer to the sections appropriate to your router.

Configuration for network modules includes:

- [Ethernet Interface Configuration, page 2-6](#)
- [FastEthernet Interface Configuration, page 2-6](#)
- [Token Ring Interface Configuration, page 2-7](#)

- [Serial Interface Configuration, page 2-7](#)
- [Asynchronous/Synchronous Serial Interface Configuration, page 2-9](#)
- [ISDN BRI Interface Configuration, page 2-12](#)
- [E1/T1 ISDN PRI Configuration, page 2-17](#)
  - [E1/T1 PRI Mode, page 2-17](#)
  - [E1 Channelized Mode, page 2-18](#)
  - [T1 Channelized Mode, page 2-20](#)
- [1-Port, 4-Wire 56-kbps DSU/CSU Configuration Setup, page 2-22](#)

When you complete the setup steps for your interface modules, go to the [“Completing the Configuration” section on page 2-23](#) for directions on saving your configuration.

## Ethernet Interface Configuration

This section contains a sample configuration for the Ethernet interface. Enter the values appropriate for your router and network. The messages you see may vary.

```
Do you want to configure Ethernet0/0 interface [yes]:
Configure IP on this interface? [yes]:
  IP address for this interface: 255.255.255.0
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 1.0.0.0, 8 subnet bits, mask is /8
Configure IPX on this interface? [no]: y
  IPX network number [1]:
  Need to select encapsulation type
    [0] sap (IEEE 802.2)
    [1] snap (IEEE 802.2 SNAP)
    [2] arpa (Ethernet_II)
    [3] novell-ether (Novell Ethernet_802.3)
  Enter the encapsulation type [2]:
```

## FastEthernet Interface Configuration

This section contains a sample configuration for the FastEthernet interface. Enter the values appropriate for your router and network. The messages you see may vary.

```
Do you want to configure FastEthernet0/0 interface [yes]:
Use the 100 Base-TX (RJ-45) connector? [yes]:
Operate in full-duplex mode? [no]:
Configure IP on this interface? [no]: yes
IP address for this interface: 6.0.0.1
Number of bits in subnet field [0]:
Class A network is 6.0.0.0, 0 subnet bits, mask is /8
Configure IPX on this interface? [yes]:
  IPX network number [1]:
  Need to select encapsulation type
    [0] sap (IEEE 802.2)
    [1] snap (IEEE 802.2 SNAP)
    [2] arpa (Ethernet_II)
    [3] novell-ether (Novell Ethernet_802.3)
  Enter the encapsulation type [2]:
```

## Token Ring Interface Configuration

This section contains a sample configuration for the Token Ring interface. Enter the values appropriate for your router and network. The messages you see may vary.

```
Do you want to configure TokenRing0/0 interface? [yes]:
Tokenring ring speed (4 or 16)? [16]:
Configure IP on this interface? [yes]:
  IP address for this interface: 1.0.0.1
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 1.0.0.0, 8 subnet bits; mask is /8
Configure IPX on this interface? [no]: y
  IPX network number [1]:
  Need to select encapsulation type
    [0] sap (IEEE 802.2)
    [1] snap (IEEE 802.2 SNAP)
  Enter the encapsulation type [0]:
```

## Serial Interface Configuration

This section contains a sample configuration for the 1- or 2-port serial interface. Enter the values appropriate for your router and network. The messages you see may vary.

```
Do you want to configure Serial0/0 interface? [yes]:
```

```
Some encapsulations supported are
  ppp/hdlc/frame-relay/lapb/atm-dxi/smds/x25
Choose encapsulation type [ppp]:
```



### Note

The following sections describe the prompts for each encapsulation type. For PPP and HDLC encapsulation, no further configuration is needed.

```
No serial cable seen.
Choose mode from (dce/dte) [dte]:
```



### Note

If no cable is plugged in to your router, you need to indicate whether the interface is to be used as DTE or DCE. If a cable is present, the **setup** command facility determines the DTE/DCE status. If the serial cable is DCE, you see the following prompt:

```
Serial interface needs clock rate to be set in dce mode.
The following clock rates are supported on the serial interface.
  0
  1200, 2400, 4800, 9600, 19200, 38400
  56000, 64000, 72000, 125000, 148000, 500000
  800000, 1000000, 1300000, 2000000, 4000000, 8000000

Choose clock rate from above: [2000000]:
Configure IP on this interface? [yes]:
  IP address for this interface: 2.0.0.1
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 2.0.0.0, 8 subnet bits; mask is /8
Configure IPX on this interface? [no]: yes
  IPX network number [8]:
```

## Frame Relay Encapsulation

```
The following lmi-types are available to be set,
when connected to a frame relay switch
    [0] none
    [1] ansi
    [2] cisco
    [3] q933a
Enter lmi-type [2]:
```



### Note

The **setup** command facility only prompts for the data-link connection identifier (DLCI) number if you specify **none** for the Local Management Interface (LMI) type. If you accept the default or specify another LMI type, the DLCI number is provided by the specified protocol.

```
Enter the DLCI number for this interface [16]:
```

```
Do you want to map a remote machine's IP address to dlci? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map a remote machine's IPX address to dlci? [yes]:
  IPX address for the remote interface: 40.1234.5678
```

```
Serial interface needs clock rate to be set in dce mode.
The following clock rates are supported on the serial interface.
  0
  1200, 2400, 4800, 9600, 19200, 38400
  56000, 64000, 72000, 125000, 148000, 500000
  800000, 1000000, 1300000, 2000000, 4000000, 8000000
```

```
choose speed from above: [2000000]: 1200
Configure IP on this interface? [yes]:
  IP address for this interface: 2.0.0.1
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 2.0.0.0, 8 subnet bits; mask is /8
```

If IPX is configured on the router, the **setup** command facility prompts for the IPX map:

```
Do you want to map a remote machine's IPX address to dlci? [yes]:
  IPX address for the remote interface: 40.0060.34c6.90ed
```

## LAPB Encapsulation

```
lapb circuit can be either in dce/dte mode.
Choose either from (dce/dte) [dte]:
```

## X.25 Encapsulation

```
x25 circuit can be either in dce/dte mode.
Choose from either dce/dte [dte]:
Enter local x25 address: 1234
```

```
We will need to map the remote x.25 station's x25 address
to the remote stations IP/IPX address
Enter remote x25 address: 4321
```

```
Do you want to map the remote machine's x25 address to IP address? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map the remote machine's x25 address to IPX address? [yes]:
  IPX address for the remote interface: 40.1234.5678
```

```

Enter lowest 2-way channel [1]:
Enter highest 2-way channel [64]:
Enter frame window (K) [7]:
Enter Packet window (W) [2]:
Enter Packet size (must be powers of 2) [128]:

```

## ATM-DXI Encapsulation

```

Enter VPI number [1]:
Enter VCI number [1]:

Do you want to map the remote machine's IP address to vpi and vci's? [yes]:
    IP address for the remote interface: 2.0.0.2
Do you want to map the remote machine's IPX address to vpi and vci's? [yes]:
    IPX address for the remote interface: 40.1234.5678

```

## SMDS Encapsulation

```

Enter smds address for the local interface: c141.5556.1415

We will need to map the remote smds station's address
to the remote stations IP/IPX address
Enter smds address for the remote interface: c141.5556.1414

Do you want to map the remote machine's smds address to IP address? [yes]:
    IP address for the remote interface: 2.0.0.2
Do you want to map the remote machine's smds address to IPX address? [yes]:
    IPX address for the remote interface: 40.1234.5678

```

## Serial Cisco IOS Commands Generated

The following is an example of the Cisco IOS commands generated by a typical serial configuration:

```

interface Serial0/0
encapsulation ppp
clock rate 2000000
ip address 2.0.0.1 255.0.0.0

```

## Asynchronous/Synchronous Serial Interface Configuration

This section contains sample configurations for an asynchronous/synchronous serial interface. Enter the values appropriate for your router and network. The messages you see may vary.

```

Do you want to configure Serial1/0 interface? [yes]:
Enter mode (async/sync) [sync]:

```

### Synchronous Configuration

If you select synchronous, you see screen displays similar to the following:

```

Do you want to configure Serial1/0 interface? [yes]:
Enter mode (async/sync) [sync]:

```

```

Some supported encapsulations are
    ppp/hdlc/frame-relay/lapb/x25/atm-dxi/smds
Choose encapsulation type [hdlc]:

```

**Note**

The following sections describe the prompts for each encapsulation type. For PPP and HDLC encapsulation, no further configuration is needed.

```
No serial cable seen.
Choose mode from (dce/dte) [dte]:
```

**Note**

If no cable is plugged in to your router, you need to indicate whether the interface is to be used as DTE or DCE. If a cable is present, the **setup** command facility determines the DTE/DCE status. If the serial cable is DCE, you see the following prompt:

```
Configure IP on this interface? [no]: yes
Configure IP unnumbered on this interface? [no]:
  IP address for this interface: 2.0.0.0
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 2.0.0.0, 0 subnet bits; mask is /8
Configure LAT on this interface? [no]:
```

## Frame Relay Encapsulation

The following lmi-types are available to be set, when connected to a frame relay switch

```
[0] none
[1] ansi
[2] cisco
[3] q933a
```

```
Enter lmi-type [2]:
```

**Note**

The **setup** command facility only prompts for the data-link connection identifier (DLCI) number if you specify **none** for the Local Management Interface (LMI) type. If you accept the default or specify another LMI type, the DLCI number is provided by the specified protocol.

```
Enter the DLCI number for this interface [16]:
```

```
Do you want to map a remote machine's IP address to dlci? [yes]:
```

```
  IP address for the remote interface: 2.0.0.2
```

```
Do you want to map a remote machine's IPX address to dlci? [yes]:
```

```
  IPX address for the remote interface: 40.1234.5678
```

Serial interface needs clock rate to be set in dce mode.

The following clock rates are supported on the serial interface.

```
0
1200, 2400, 4800, 9600, 19200, 38400
56000, 64000, 72000, 125000, 148000, 500000
800000, 1000000, 1300000, 2000000, 4000000, 8000000
```

```
choose speed from above: [2000000]: 1200
```

```
Configure IP on this interface? [yes]:
```

```
  IP address for this interface: 2.0.0.1
```

```
  Subnet mask for this interface [255.0.0.0]:
```

```
  Class A network is 2.0.0.0, 8 subnet bits; mask is /8
```

**Note**

If IPX is configured on the router, the **setup** command facility prompts for the IPX map:

```
Do you want to map a remote machine's IPX address to dlci? [yes]:
```

```
  IPX address for the remote interface: 40.0060.34c6.90ed
```

## LAPB Encapsulation

```
lapb circuit can be either in dce/dte mode.
Choose either from (dce/dte) [dte]:
```

## X.25 Encapsulation

```
x25 circuit can be either in dce/dte mode.
Choose from either dce/dte [dte]:
Enter local x25 address: 1234
```

```
We will need to map the remote x.25 station's x25 address
to the remote stations IP/IPX address
Enter remote x25 address: 4321
```

```
Do you want to map the remote machine's x25 address to IP address? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map the remote machine's x25 address to IPX address? [yes]:
  IPX address for the remote interface: 40.1234.5678
```

```
Enter lowest 2-way channel [1]:
Enter highest 2-way channel [64]:
Enter frame window (K) [7]:
Enter Packet window (W) [2]:
Enter Packet size (must be powers of 2) [128]:
```

## ATM-DXI Encapsulation

```
Enter VPI number [1]:
Enter VCI number [1]:
```

```
Do you want to map the remote machine's IP address to vpi and vci's? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map the remote machine's IPX address to vpi and vci's? [yes]:
  IPX address for the remote interface: 40.1234.5678
```

## SMDS Encapsulation

```
Enter smds address for the local interface: c141.5556.1415
```

```
We will need to map the remote smds station's address
to the remote stations IP/IPX address
Enter smds address for the remote interface: c141.5556.1414
```

```
Do you want to map the remote machine's smds address to IP address? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map the remote machine's smds address to IPX address? [yes]:
  IPX address for the remote interface: 40.1234.5678
```

## Asynchronous Configuration

If you select asynchronous, you see screen displays similar to the following:

```
Do you want to configure Serial1/1 interface? [yes]:
Enter mode (async/sync) [sync]: async
Configure IP on this interface? [yes]:
Configure IP unnumbered on this interface? [no]:
  IP address for this interface: 2.0.0.0
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 2.0.0.0, 0 subnet bits; mask is /8
Configure LAT on this interface? [no]:
```

```

Configure AppleTalk on this interface? [no]:
Configure DECnet on this interface? [no]:
Configure CLNS on this interface? [no]:
Configure IPX on this interface? [no]: yes
  IPX network number [8]:
Configure Vines on this interface? [no]:
Configure XNS on this interface? [no]:
Configure Apollo on this interface? [no]:

```

## ISDN BRI Interface Configuration

Use the System Configuration Dialog to configure an ISDN BRI interface. This configuration requires you to enter the ISDN switch type. These switch types are shown in [Table 2-1](#).

**Table 2-1** ISDN Switch Types

Country	ISDN Switch Type	Description
Australia	basic-ts013	Australian TS013 switches
Europe	basic-1tr6	German 1TR6 ISDN switches
	basic-nwnet3	Norwegian NET3 ISDN switches (phase 1)
	basic-net3	NET3 ISDN switches (UK and others)
	basic-net5	NET5 switches (UK and others)
	vn2	French VN2 ISDN switches
	vn3	French VN3 ISDN switches
Japan	ntt	Japanese NTT ISDN switches
New Zealand	basic-nznet3	New Zealand NET3 switches
North America	basic-5ess	AT&T basic rate switches
	basic-dms100	NT DMS-100 basic rate switches
	basic-ni1	National ISDN-1 switches

When you reach the following prompt on the System Configuration Dialog, enter an ISDN switch type from [Table 2-1](#):

```

BRI interface needs isdn switch-type to be configured
Valid switch types are:
  [0] none.....Only if you don't want to configure BRI.
  [1] basic-1tr6....1TR6 switch type for Germany
  [2] basic-5ess....AT&T 5ESS switch type for the US/Canada
  [3] basic-dms100..Northern DMS-100 switch type for US/Canada
  [4] basic-net3....NET3 switch type for UK and Europe
  [5] basic-ni.....National ISDN switch type
  [6] basic-ts013...TS013 switch type for Australia
  [7] ntt.....NTT switch type for Japan
  [8] vn3.....VN3 and VN4 switch types for France

Choose ISDN BRI Switch Type [2]:

Do you want to configure BRI0/0 interface? [yes]:

Some encapsulations supported are
  ppp/hdlc/frame-relay/lapb/x25

```

```
Choose encapsulation type [ppp]:
```

**Note**

The following sections describe the prompts for each encapsulation type. No further configuration is needed for HDLC encapsulation.

```
Do you have a service profile identifiers (SPIDs) assigned? [no]: y
Enter SPID1: 12345
Enter SPID2: 12345
```

**Note**

The **setup** command facility only prompts for the SPID number if you specify **basic-5ess**, **basic-ni1**, or **basic-dms100** for the switch type.

```
Do you want to map the remote machine's IP address in dialer map? [yes]:
IP address for the remote interface: 2.0.0.1
Do you want to map the remote machine's IP address in dialer map? [yes]:
IPX address of the remote interface: 40.0060.34c6.90ed
```

```
To get to 2.0.0.1 we will need to make a phone call.
Please enter the phone number to call: 1234567890
Configure IP on this interface? [yes]:
```

**Note**

If your router has at least one configured LAN interface, you can choose to use an unnumbered IP address on the interface.

```
Configure IP unnumbered on this interface? [no]: y
Assign to which interface [Ethernet0/0]:
```

**Note**

If your router does not have a configured LAN interface, you must use a numbered IP address.

```
IP address for this interface: 2.0.0.0.1
Enter the subnet mask [255.0.0.0]:
```

## PPP Encapsulation

```
Would you like to enable multilink PPP [yes]:
```

```
Enter a remote hostname for PPP authentication [Router]:
Enter a password for PPP authentication:
```

**Note**

The password, which is used by the Challenge Handshake Authentication Protocol (CHAP) authentication process, is case sensitive and must match the remote router's password exactly.

## Frame Relay Encapsulation

```
The following lmi-types are available to be set,
when connected to a frame relay switch
```

```
[0] none
[1] ansi
[2] cisco
[3] q933a
Enter lmi-type [2]:
```

**Note**

The **setup** command facility only prompts for the data-link connection identifier (DLCI) number if you specify **none** for the Local Management Interface (LMI) type. If you accept the default or specify another LMI type, the DLCI number is provided by the specified protocol.

```
Enter the DLCI number for this interface [16]:
```

```
Do you want to map a remote machine's IP address to dlci? [yes]:
```

```
IP address for the remote interface: 2.0.0.2
```

```
Do you want to map a remote machine's IPX address to dlci? [yes]:
```

```
IPX address for the remote interface: 40.1234.5678
```

```
Serial interface needs clock rate to be set in dce mode.
```

```
The following clock rates are supported on the serial interface.
```

```
0
```

```
1200, 2400, 4800, 9600, 19200, 38400
```

```
56000, 64000, 72000, 125000, 148000, 500000
```

```
800000, 1000000, 1300000, 2000000, 4000000, 8000000
```

```
choose speed from above: [2000000]: 1200
```

```
Configure IP on this interface? [yes]:
```

```
IP address for this interface: 2.0.0.1
```

```
Subnet mask for this interface [255.0.0.0]:
```

```
Class A network is 2.0.0.0, 8 subnet bits; mask is /8
```

**Note**

If IPX is configured on the router, the **setup** command facility prompts for the IPX map:

```
Do you want to map a remote machine's IPX address to dlci? [yes]:
```

```
IPX address for the remote interface: 40.0060.34c6.90ed
```

**LAPB Encapsulation**

```
lapb circuit can be either in dce/dte mode
```

```
Choose either from (dce/dte) [dte]:
```

**ATM-DXI Encapsulation**

```
Enter VPI number [1]:
```

```
Enter VCI number [1]:
```

```
Do you want to map the remote machine's IP address to vpi and vci's? [yes]:
```

```
IP address for the remote interface: 6.0.0.1
```

```
Do you want to map the remote machine's IPX address to vpi and vci's? [yes]:
```

```
IPX address for the remote interface: 40.0060.34c6.90ed
```

**SMDS Encapsulation**

```
Enter smds address for the local interface: c141.5556.1415
```

```
We will need to map the remote smds station's address to the remote stations IP address
```

```
Enter smds address for the remote interface: c141.5556.1414
```

```
Do you want to map the remote machine's smds address to IP address? [yes]:
```

```
IP address for the remote interface: 2.0.0.1
```

```
Do you want to map the remote machine's smds address to IP address? [yes]:
```

```
IPX address for the remote interface: 40.0060.34c6.90ed
```

## X.25 Encapsulation

```
x25 circuit can be either in dce/dte mode.
Choose from either dce/dte [dte]:
Enter local x25 address: 1234

We will need to map the remote x.25 station's x25 address
to the remote stations IP/IPX address
Do you want to map the remote machine's x25 address to IP address? [yes]:
    IP address for the remote interface: 6.0.0.1
Do you want to map the remote machine's x25 address to IPX address? [yes]:
    IPX address for the remote interface: 40.0060.34c6.90ed
Enter remote x25 address: 4321
Enter lowest 2-way channel [1]:
Enter highest 2-way channel [64]:
Enter frame window (K) [7]:
Enter Packet window (W) [2]:
Enter Packet size (must be powers of 2) [128]:
```

## ISDN BRI Line Configuration

Before using a router with an ISDN BRI interface, you must order a correctly configured ISDN BRI line from your local telecommunications service provider.

The ordering process varies from provider to provider and from country to country. However, here are some general guidelines:

- Ask for two channels to be called by one number.
- Ask for delivery of calling line identification, also known as caller ID or Automatic Number Identification (ANI).
- If the router will be the only device attached to the ISDN BRI line, ask for point-to-point service and a data-only line.
- If you plan to connect another ISDN device (such as an ISDN telephone) to the ISDN BRI line through the router, ask for point-to-multipoint service (subaddressing is required) and a voice-and-data line.

## ISDN BRI Provisioning by Switch Type

ISDN BRI provisioning refers to the types of services provided by the ISDN BRI line. Although provisioning is performed by your ISDN BRI service provider, you must tell the provider what you want.

[Table 2-2](#) lists the provisioning you should order for the router based on switch type.

Table 2-2 ISDN Provisioning by Switch Type

Switch Type	Provisioning
5ESS Custom BRI	<b>For data only</b> 2 B channels for data Point to point Terminal type = E 1 directory number (DN) assigned by service provider MTERM = 1 Request delivery of calling line ID on Centrex lines Set speed for ISDN calls to 56 kbps outside local exchange
5ESS Custom BRI	<b>For voice and data</b> (Use these values only if you have an ISDN telephone connected.) 2 B channels for voice or data MultiPoint Terminal type = D 2 directory numbers assigned by service provider 2 service profile identifiers (SPIDs) required, assigned by service provider MTERM = 2 Number of call appearances = 1 Display = No Ringing/idle call appearances = idle Autohold= no Onetouch = no Request delivery of calling line ID on Centrex lines Set speed for ISDN calls to 56 kbps outside local exchange Directory number 1 can hunt to directory number 2
5ESS National ISDN (NI-1) BRI	Terminal type = A 2 B channels for voice and data 2 directory numbers assigned by service provider 2 SPIDs required; assigned by service provider Set speed for ISDN calls to 56 kbps outside local exchange Directory number 1 can hunt to directory number 2
DMS-100 BRI	2 B channels for voice and data 2 directory numbers assigned by service provider 2 SPIDs required; assigned by service provider Functional signaling Dynamic terminal endpoint identifier (TEI) assignment Maximum number of keys = 64 Release key = no, or key number = no Ringing indicator = no EKTS = no PVC = 2 Request delivery of calling line ID on Centrex lines Set speed for ISDN calls to 56 kbps outside local exchange Directory number 1 can hunt to directory number 2

## Defining ISDN Service Profile Identifiers

Some service providers assign service profile identifiers (SPIDs) to define the services subscribed to by an ISDN device. If your service provider requires SPIDs, your ISDN device cannot place or receive calls until it sends a valid SPID to the service provider when initializing the connection. A SPID is usually a seven-digit telephone number plus some optional numbers, but service providers may use different numbering schemes. SPIDs have significance at the local access ISDN interface only; remote routers are never sent the SPID.

Currently, only DMS-100 and NI-1 switch types require SPIDs. Two SPIDs are assigned for the DMS-100 switch type, one for each B channel. The AT&T 5ESS switch type may support SPIDs, but Cisco recommends that you set up that ISDN service without SPIDs.

If your service provider assigns you SPIDs, you must define these SPIDs on the router. To define SPIDs and the local directory number (LDN) on the router for both ISDN BRI B channels, use the following **isdn spid** commands:

```
Router(config-if)# isdn spid1 spid-number [ldn]
```

```
Router(config-if)# isdn spid2 spid-number [ldn]
```



### Note

Although the LDN is an optional parameter in the command, you may need to enter it so the router can answer calls made to the second directory number.

## E1/T1 ISDN PRI Configuration

This section contains a sample configuration for the channelized E1/T1 ISDN PRI interface. Enter the values appropriate for your router and network. The messages you see may vary.

The following ISDN switch types are available:

```
[0] none.....If you do not want to configure ISDN
[1] primary-4ess....AT&T 4ESS switch type for US and Canada
[2] primary-5ess....AT&T 5ESS switch type for US and Canada
[3] primary-dms100..Northern Telecom switch type for US and Canada
[4] primary-net5....European switch type for NET5
[5] primary-ni.....National ISDN Switch type for the U.S
[6] primary-ntt....Japan switch type
[7] primary-ts014...Australian switch type
Choose ISDN PRI Switch Type [2]:
```

Configuring controller T1 1/0 in pri or channelized mode

Do you want to configure this interface controller? [no]:

Will you be using PRI on this controller? [yes]:

### E1/T1 PRI Mode

The following is an example of a E1/T1 PRI mode configuration using the **setup** command facility:

The following framing types are available:

```
esf | sf
```

Enter the framing type [esf]:

The following linecode types are available:

```
ami | b8zs
```

Enter the line code type [b8zs]:

Enter number of time slots [24]:

Do you want to configure Serial1/0:23 interface? [yes]:

Configuring the PRI D-channel

```
Would you like to enable multilink PPP? [yes]:
Configure IP on this interface? [no]: y
Configure IP unnumbered on this interface? [no]: y
Assign to which interface [Ethernet0/0]:
```

All users dialing in through the PRI will need to be authenticated using CHAP. The username and password are case sensitive.

```
Enter more username and passwords for PPP authentication? [no]: y
Enter the username used for dial-in CHAP authentication [Router]: Enter the PPP password
of the user dialling in on PRI:
Enter more username and passwords for PPP authentication? [no]:
```

## E1 Channelized Mode

The following is an example of an E1 channelized mode configuration using the **setup** command facility:

The following framing types are available:

```
no-crc4 | crc4
Enter the framing type [crc4]:
```

The following linecode types are available:

```
ami | hdb3
Enter the line code type [hdb3]:
```

```
Do you want to configure Serial1/1:0 interface?: [Yes]:
```

Configuring the Channelized E1/T1 serial channels

Some encapsulations supported are

```
ppp/hdlc/frame-relay/lapb/atm-dxi/smds/x25
Choose encapsulation type [ppp]:
Configure IP on this interface? [no]: y
Configure IP unnumbered on this interface? [no]:
IP address for this interface: 3.0.0.1
Subnet mask for this interface [255.0.0.0]:
Class A network is 3.0.0.0, 8 subnet bits; mask is /8
```



### Note

The following sections describe the prompts for each encapsulation type. No further configuration is needed for HDLC encapsulation.

## PPP Encapsulation

```
Would you like to enable multilink PPP [yes]:
```

```
Enter a remote hostname for PPP authentication [Router]:
Enter a password for PPP authentication:
```



### Note

The password, which is used by the Challenge Handshake Authentication Protocol (CHAP) authentication process, is case sensitive and must match the remote router's password exactly.

## Frame Relay Encapsulation

```
The following lmi-types are available to be set,
when connected to a frame relay switch
[0] none
```

```

[1] ansi
[2] cisco
[3] q933a
Enter lmi-type [2]:

```

**Note**

The **setup** command facility only prompts for the data-link connection identifier (DLCI) number if you specify **none** for the Local Management Interface (LMI) type. If you accept the default or specify another LMI type, the DLCI number is provided by the specified protocol.

```

Enter the DLCI number for this interface [16]:

Do you want to map a remote machine's IP address to dlci? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map a remote machine's IPX address to dlci? [yes]:
  IPX address for the remote interface: 40.1234.5678

Serial interface needs clock rate to be set in dce mode.
The following clock rates are supported on the serial interface.
  0
  1200, 2400, 4800, 9600, 19200, 38400
  56000, 64000, 72000, 125000, 148000, 500000
  800000, 1000000, 1300000, 2000000, 4000000, 8000000

choose speed from above: [2000000]: 1200
Configure IP on this interface? [yes]:
  IP address for this interface: 2.0.0.1
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 2.0.0.0, 8 subnet bits; mask is /8

```

**Note**

If IPX is configured on the router, the **setup** command facility prompts for the IPX map:

```

Do you want to map a remote machine's IPX address to dlci? [yes]:
  IPX address for the remote interface: 40.0060.34c6.90ed

```

**LAPB Encapsulation**

```

lapb circuit can be either in dce/dte mode
Choose either from (dce/dte) [dte]:

```

**ATM-DXI Encapsulation**

```

Enter VPI number [1]:
Enter VCI number [1]:
Do you want to map the remote machine's IP address to vpi and vci's? [yes]:
  IP address for the remote interface: 6.0.0.1
Do you want to map the remote machine's IPX address to vpi and vci's? [yes]:
  IPX address for the remote interface: 40.0060.34c6.90ed

```

**SMDS Encapsulation**

```

Enter smds address for the local interface: c141.5556.1415

We will need to map the remote smds station's address to the remote stations IP address
Enter smds address for the remote interface: c141.5556.1414

Do you want to map the remote machine's smds address to IP address? [yes]:
  IP address for the remote interface: 2.0.0.1
Do you want to map the remote machine's smds address to IP address? [yes]:
  IPX address for the remote interface: 40.0060.34c6.90ed

```

## X.25 Encapsulation

```
x25 circuit can be either in dce/dte mode.
Choose from either dce/dte [dte]:
Enter local x25 address: 1234
```

```
We will need to map the remote x.25 station's x25 address
to the remote stations IP/IPX address
Do you want to map the remote machine's x25 address to IP address? [yes]:
    IP address for the remote interface: 6.0.0.1
Do you want to map the remote machine's x25 address to IPX address? [yes]:
    IPX address for the remote interface: 40.0060.34c6.90ed
Enter remote x25 address: 4321
Enter lowest 2-way channel [1]:
Enter highest 2-way channel [64]:
Enter frame window (K) [7]:
Enter Packet window (W) [2]:
Enter Packet size (must be powers of 2) [128]:
```

## T1 Channelized Mode

The following is an example of a T1 channelized mode configuration using the **setup** command facility:

```
The following framing types are available:
    esf | sf
Enter the framing type [esf]:

The following linecode types are available:
    ami | b8zs
Enter the line code type [b8zs]:

T1 is capable of being configured for channel 1-24
Enter number of time slots [24]: 3
Configure more channel groups? [no]: y
Enter number of time slots [21]: 3
Configure more channel groups? [no]: y
Enter number of time slots [18]: 3
Configure more channel groups? [no]: y
Enter number of time slots [15]:
Configure more channel groups? [no]:
```



### Note

The following sections describe the prompts for each encapsulation type. No further configuration is needed for HDLC encapsulation.

## PPP Encapsulation

```
Would you like to enable multilink PPP [yes]:

Enter a remote hostname for PPP authentication [Router]:
Enter a password for PPP authentication:
```



### Note

The password, which is used by the Challenge Handshake Authentication Protocol (CHAP) authentication process, is case sensitive and must match the remote router's password exactly.

## Frame Relay Encapsulation

The following lmi-types are available to be set,

```

when connected to a frame relay switch
    [0] none
    [1] ansi
    [2] cisco
    [3] q933a
Enter lmi-type [2]:

```

**Note**

The **setup** command facility only prompts for the data-link connection identifier (DLCI) number if you specify **none** for the Local Management Interface (LMI) type. If you accept the default or specify another LMI type, the DLCI number is provided by the specified protocol.

```

Enter the DLCI number for this interface [16]:

Do you want to map a remote machine's IP address to dlci? [yes]:
  IP address for the remote interface: 2.0.0.2
Do you want to map a remote machine's IPX address to dlci? [yes]:
  IPX address for the remote interface: 40.1234.5678

Serial interface needs clock rate to be set in dce mode.
The following clock rates are supported on the serial interface.
  0
  1200, 2400, 4800, 9600, 19200, 38400
  56000, 64000, 72000, 125000, 148000, 500000
  800000, 1000000, 1300000, 2000000, 4000000, 8000000

choose speed from above: [2000000]: 1200
Configure IP on this interface? [yes]:
  IP address for this interface: 2.0.0.1
  Subnet mask for this interface [255.0.0.0]:
  Class A network is 2.0.0.0, 8 subnet bits; mask is /8

If IPX is configured on the router, the setup command facility prompts for the IPX map:
Do you want to map a remote machine's IPX address to dlci? [yes]:
  IPX address for the remote interface: 40.0060.34c6.90ed

```

**LAPB Encapsulation**

```

lapb circuit can be either in dce/dte mode
Choose either from (dce/dte) [dte]:

```

**ATM-DXI Encapsulation**

```

Enter VPI number [1]:
Enter VCI number [1]:
Do you want to map the remote machine's IP address to vpi and vci's? [yes]:
  IP address for the remote interface: 6.0.0.1
Do you want to map the remote machine's IPX address to vpi and vci's? [yes]:
  IPX address for the remote interface: 40.0060.34c6.90ed

```

**SMDS Encapsulation**

```

Enter smds address for the local interface: c141.5556.1415

We will need to map the remote smds station's address to the remote stations IP address
Enter smds address for the remote interface: c141.5556.1414

Do you want to map the remote machine's smds address to IP address? [yes]:
  IP address for the remote interface: 2.0.0.1
Do you want to map the remote machine's smds address to IP address? [yes]:

```

```
IPX address for the remote interface: 40.0060.34c6.90ed
```

## 1-Port, 4-Wire 56-kbps DSU/CSU Configuration Setup

This section describes using **setup** command facility to configure a 1-port, 4-wire 56-kbps DSU/CSU WAN interface card. It discusses the following:

- [Choosing Circuit-Switched or Dedicated-Line Service](#)
- [Switched Mode](#)
- [Dedicated Mode](#)

### Choosing Circuit-Switched or Dedicated-Line Service

The switched-56 WAN interface card is configured for dedicated or leased-line service by default, but it can also be configured for circuit-switched service. Depending on the type of data transmissions you typically use, you can configure the switched-56 WAN interface card for circuit-switched or dedicated-line service.

Generally, circuit-switched service is ideal for short duration data transmissions or as an alternative route if a dedicated line fails. For example, circuit-switched service is ideal for sending electronic mail messages or doing such tasks as updating inventory and ordering records from one network database to another at the end of each day.

Dedicated service is ideal for heavy network traffic. Dedicated service is ideal if you need a constant network connection or you need connection for more than eight hours per day.

### Switched Mode

The following is an example of a 1-port, 4-wire 56-kbps DSU/CSU switched-mode configuration using the **setup** command facility:

```
Do you want to configure Serial0/0 interface? [yes]:
  Some encapsulations supported are
    ppp/hdlc/frame-relay/lapb/atm-dxi/smds/x25
  Choose encapsulation type [ppp]:

Switched 56k interface may either be in switched/Dedicated mode
  Choose from either (switched/dedicated) [switched]:

The following switched carrier types are to be set when in switched mode
(at&t, sprint or other)
  Choose carrier (at&t/sprint/other) [other]:

Do you want to map the remote machine's ip address in dialer map? [yes]:
  IP address for the remote interface : 1.0.0.2
Do you want to map the remote machine's ipx address in dialer map? [yes]:
  IPX address for the remote interface : 40.0060.34c6.90ed
```



#### Note

The **setup** command facility will ask for only one telephone number for both IP and IPX (if enabled).

```
Please enter the phone number to call : 1234567890
Configure IP on this interface? [yes]:
  IP address for this interface: 1.0.0.1
  Subnet mask for this interface [255.0.0.0] :
  Class A network is 1.0.0.0, 8 subnet bits; mask is /8
```

## Dedicated Mode

The following is an example of a 1-port, 4-wire 56-kbps DSU/CSU dedicated-mode configuration using the **setup** command facility:

```
Do you want to configure Serial0/0 interface? [yes]:
```

```
Some encapsulations supported are
    ppp/hdlc/frame-relay/lapb/atm-dxi/smds/x25
Choose encapsulation type [ppp]:
```

```
Switched 56k interface may either be in switched/Dedicated mode
Choose from either (switched/dedicated) [switched]: dedi
```

```
When in dds mode, the clock for sw56 module can either from line/internal.
Choose clock from (line/internal) [line]:
```



### Note

If **internal** is selected, speed cannot be set to “auto.” Auto-sensing is only allowed when the clock source is line.

```
When in dds mode, the clock for sw56 module can either from line/internal.
Choose clock from (line/internal) [line]: internal
Warning: internal can be choose only when connected back to back.
```

```
Serial interface needs clock rate to be set in dce mode.
The following clock rates are supported on the serial interface.
```

```
    auto, 2.4, 4.8, 9.6, 19.2, 38.4
    56, 64
```

```
choose clock rate from above [56]:
Configure IP on this interface? [yes]:
IP address for this interface: 1.0.0.1
Subnet mask for this interface [255.0.0.0] :
Class A network is 1.0.0.0, 8 subnet bits; mask is /8
```

## Completing the Configuration

When you have provided all the information prompted for by the **setup** command facility, the configuration appears. Some examples of the configurations of the Cisco 2600 Series, Cisco 3600 series, and Cisco 3700 series routers are shown in [Appendix A, “Configuration Examples.”](#)

To complete your router configuration, do the following:

**Step 1** A **setup** command facility prompt asks if you want to save this configuration.

If you answer no, the configuration information you entered is *not* saved, and you return to the router enable prompt (2600#). Type **setup** to return to the System Configuration Dialog.

If you answer yes, the configuration is saved and you are returned to the EXEC prompt (2600>).

```
Use this configuration? {yes/no} : yes
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.
```

Press RETURN to get started!

```
%LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
%LINK-3-UPDOWN: Interface Ethernet0/1, changed state to up
%LINK-3-UPDOWN: Interface Serial0/0, changed state to up
%LINK-3-UPDOWN: Interface Serial0/1, changed state to down
%LINK-3-UPDOWN: Interface Serial0/2, changed state to down
%LINK-3-UPDOWN: Interface Serial1/0, changed state to up
%LINK-3-UPDOWN: Interface Serial1/1, changed state to down
%LINK-3-UPDOWN: Interface Serial1/2, changed state to down
```

<Additional messages omitted.>

**Step 2** When the messages stop displaying on your screen, press **Return** to get the `2600>` prompt.



**Note** If you see the next message, it means that no other AppleTalk routers were found on the network attached to the port.

```
%AT-6-ONLYROUTER: Ethernet0/0: AppleTalk port enabled; no neighbors found
```

**Step 3** The `2600>` prompt indicates that you are now at the command-line interface (CLI) and you have just completed a basic router configuration. However, this is *not* a complete configuration. At this point you have two choices:

- Run the **setup** command facility again and create another configuration. Enter the following:

```
2600> enable
Password: password
2600# setup
```

- Modify the existing configuration or configure additional features with the CLI as described in [Chapter 3, “Configuring with the Command-Line Interface.”](#)

## Where to Go Next

At this point you can proceed to the following:

- [“Chapter 3, “Configuring with the Command-Line Interface,”](#) to learn how to use the CLI to configure additional features.
- The Cisco IOS software configuration guide and command reference publications for more advanced configuration topics. These publications are available on Cisco.com, the Documentation CD-ROM that came with your router, or you can order printed copies. For more information, refer to [“Obtaining Documentation.”](#)