

Preparing for First-Time Startup

This chapter helps you prepare for first-time startup. Read it *before* you power up your router.

By preparing for first-time startup, you can take advantage of the full range of configurations available on your routers, including the protocol translation option. You are not required to plan your network before sitting at the console and using the **setup** command facility for the first time, but you must connect an ASCII terminal to the router's system console port as described in the "Overview" chapter. By separating the planning tasks from the configuration tasks, you can set up the router in one sitting. You can also tailor the router to meet your needs and to fit within a consistent network scheme.

This chapter helps you complete the following tasks:

- Filling in the Global Configuration Worksheet
- Filling in the Interface Configuration Worksheet

Use the blank configuration worksheets in the "Blank Worksheets" appendix to record parameter values, according to the information in this chapter. The Global Configuration Worksheet can accommodate global information about a single router. If you plan to install more than one router, make additional copies of the blank worksheet. The Interface Configuration Worksheet can accommodate four interfaces. If you plan to install more than four interfaces on your router, make additional copies of the blank worksheet.

You use these worksheets to help gather and maintain information about your router. The worksheets map to the two-part configuration process of the **setup** command facility, which is automatically invoked at first-time startup. In the first part of the configuration process, you use the values recorded on the Global Configuration Worksheet to specify *global* or system-wide parameters. In the second part, you configure each individual interface using the values you recorded on the Interface Configuration Worksheet.

Filling in the Global Configuration Worksheet

The Global Configuration Worksheet, when properly filled in, contains all the values you need to enter when you configure global parameters with the **setup** command facility. Remember, the **setup** command facility is automatically invoked at first-time startup. Preparing the pertinent information before you start up the router enables you to get your system running quickly and uneventfully.

The worksheet lists two levels of information:

- System hardware information
- Global parameters

The **setup** command facility does *not* request system hardware information at first-time startup, but it is useful to write the information on the worksheet to complete your records. The facility *does* request global parameters at first-time startup.

Figure 2-1 shows the Global Configuration Worksheet. Obtain a copy of the blank Global Configuration Worksheet in the “Blank Worksheets” appendix before continuing. As you proceed through the following descriptions, record your information on it.

Note To configure a specific protocol on an individual interface, you must first specify that protocol as a global parameter. For example, if you specify No to the XNS protocol at the global level, XNS parameters do not appear at the interface level. Likewise, if you specify Yes to the XNS protocol at the global level, you must also provide interface-specific information for XNS at the interface configuration level. For this reason, you should complete both the global and interface configuration worksheets before powering up your system.

Figure 2-1 Global Configuration Worksheet

Network Design Information Sheet

System Type: (for example, Cisco 1000, Cisco 4000...): _____

System Serial No.: _____ Number of Interfaces: _____

Global Parameters

Host Name:			
Enable Secret:			
Enable Password:			
Virtual Terminal Password:			
SNMP:	Yes	No	Community String: _____
XRemote	Yes	No	
Font			
Server:	IP Address:	_____	
	IP Address:	_____	
	IP Address:	_____	
	IP Address:	_____	
DECnet:	Yes	No	
	Area No.:	_____	
	Node No.:	_____	
	Area (Level 2) Routing:	Yes	No
IP:	Yes	No	
	Routing Protocol (choose one):		
	IGRP	Yes	No IGRP Autonomous System: _____
	RIP	Yes	No
IPX:	Yes	No	
XNS:	Yes	No	
AppleTalk:	Yes	No	
	Multizone:	Yes	No
Apollo:	Yes	No	
	Routing No.:	_____	
CLNS:	Yes	No	
	Router Tag:	_____	
	Domain:	_____	
	Area:	_____	
	Station ID:	_____	
Banyan VINES:	Yes	No	
Bridging:	Yes	No	
LAT	(Yes / No)		
ISDN BRI	Switch Type:	_____	

52871

Determining System Hardware Information

Use this section to determine system hardware information and record the information on the Global Configuration Worksheet.

A **Default:** label marks the factory default and an **Action:** label marks the action you take to fill in the worksheet.

System Type

Several network routers accommodate a wide variety of connectors, appliques, and interface controller cards. The system type is clearly marked on the front of your router. The following system types are available:

- AGS+
- MGS
- CGS
- Cisco 2500
- Cisco 3000 series
- Cisco 4000 series
- Cisco 7000 series

Default: None

Action: Circle your system type on the worksheet, or write it in.

System Serial Number

The serial number is on the bottom or back panel. This number can help you track your physical inventory.

Default: None

Action: Write your system serial number on the worksheet.

Number of Interfaces

When you order a system, you specify the number and type of interfaces you want the factory to install. The number of interfaces depends on the type of system you have and the number of interface cards installed. Check the back of your router to verify the number of installed interfaces. For help in identifying the installed interfaces, refer to the installation and maintenance guide for your router.

The number of installed interfaces affects the second part of the configuration process. It determines how many Interface Configuration Worksheets you fill in, and what information you need to provide at first-time startup.

Default: None

Action: Write the number of interfaces on the worksheet.

Determining Global Parameters

This section contains information about the global parameters that you can configure through the **setup** command facility. A **Default:** label marks the factory default, and an **Action:** label marks the action you take to fill in the worksheet. Use this information to complete the Global Configuration Worksheet.

Host Name

The host name is the name of your router. The name you specify is used in system prompts and can contain from 1 to 80 uppercase and lowercase alphanumeric characters. The host name is case sensitive. A number can be the first character. Leading spaces are ignored. For example, “ 4000F2” is interpreted as “4000F2” (without the space).

Use a name that helps you identify the location of the router, or to whom it is providing routing services. If you will be naming more than one host in your network, devise a consistent naming scheme so that host identification is easy.

Default: Router

Action: Write your host name on the worksheet the way you want it to appear in system prompts.

Enable Password

Your system has two default levels of security: user and privileged. The commands at the user level are a subset of those at the privileged level. Because many privileged commands are used to set operating parameters, you should password-protect these commands to prevent unauthorized use. Users must enter the correct password, called the “enable password,” to gain access to the privileged-level commands.

There is no factory default enable password. However, the enable password you set during first-time startup appears as the default the next time you run the **setup** command facility.

An enable password can contain from 1 to 80 uppercase and lowercase alphanumeric characters, except that the first character cannot be a number. Some spaces are valid password characters; for example, “two words” is valid. Leading spaces are ignored, but trailing spaces are recognized. For example, “ woolly” is interpreted as “woolly” (without the space). On the other hand, “woolly ” is interpreted as “woolly ” (with the space).

For more information about the enable password, refer to the *Router Products Configuration Guide* or the *Router Products Command Reference* publication.

Default: None

Action: Write the enable password on the worksheet.

Virtual Terminal Password

In addition to the enable password, every virtual terminal line requires a password. If you do not set a password, by default the system responds to attempted connections by displaying an error message and closing the connection. (You use virtual terminal lines when you access the router remotely via the Telnet protocol or the DEC Maintenance Operation Protocol [MOP].)

A virtual terminal password can contain from 1 to 80 uppercase and lowercase alphanumeric characters, except that the first character cannot be a number. Some spaces are valid password characters; for example, “two words” is valid. Leading spaces are ignored, but trailing spaces are recognized. For example, “ woolly” is interpreted as “woolly” (without the space). On the other hand, “woolly ” is interpreted as “woolly ” (with the space).

The virtual terminal password is case sensitive. There is no factory default virtual terminal password. However, the virtual terminal password you set during first-time startup appears as the default the next time you run the **setup** command facility.

Although each virtual terminal line requires a password by default, you can disable password checking to allow line connections without passwords. With this configuration, users are not required to give a password, although one may exist. To disable passwords, use the **no login** command. Refer to the *Router Products Configuration Guide* and the *Router Products Command Reference* for more information on disabling passwords.

Default: None

Action: Write your virtual terminal password on the worksheet. This single password applies to all virtual terminal lines.

SNMP

The Simple Network Management Protocol (SNMP) is the most widely supported open standard for network management. It provides a means to access and set configuration and run-time parameters of routers and communication servers. SNMP defines a set of functions that can be used to monitor and control network elements.

You configure SNMP on a global basis only; you cannot specify it for individual interfaces.

Default: No

Action: Circle Yes on the worksheet if you want to configure SNMP on a system-wide basis. At first-time startup, this value configures read-only SNMP with a blank password. Circle No if you do not want to run SNMP.

If you configure SNMP, also specify a community string as follows:

- Community string

SNMP v.1 message headers contain a version number and a community string. The community string defines an access environment for network management systems that use the community string. Network management systems that do not know the correct community string are precluded from SNMP v.1 operations.

The community string can be any number of printable characters. Leading, embedded, and trailing spaces are not permitted. For example, “ mycommunity”, “my community”, and “mycommunity ” are invalid community strings due to the leading, embedded, and trailing spaces, respectively. “ThisIsMyCommunity5” is a valid community string because no spaces exist. The community string is case sensitive.

Default: public

Action: Create a community string name that acts as a password. Write the community string on the worksheet.

XRemote Font Server

Your router supports the Network Computing Device, Inc. XRemote feature on the Cisco 2500, Cisco 3000 series, and Cisco 4000 series of routers. When an NCD terminal does not include in ROM the fonts used by X applications, you must identify one or more font servers from which the router and the NCD terminal can obtain fonts. You can identify as many XRemote font servers as you need; it is unlikely you will reach the maximum number that the software allows.

You can use the **setup** command facility at first-time startup to identify one or more XRemote font servers. If you use **setup** to configure your XRemote font servers, the facility prompts you to enter an IP address for each font server. After first-time startup, you use the **xremote tftp host** command to configure XRemote font servers.

Default: No

Action: If you want to configure one or more XRemote font servers during first-time startup, circle Yes on the worksheet. If you do not want to configure XRemote font servers on your system or you do not want to configure XRemote font servers using the **setup** command facility, circle No.

Enter an IP address for each XRemote font server.

- IP address for the XRemote font server

Internet addresses are 32-bit values assigned to hosts that use the IP protocols. Write these addresses in dotted decimal format (four decimal numbers separated by periods) such as 192.17.5.100. Each number is an 8-bit value between 0 and 255. Refer to the *Internetworking Technology Overview* for a detailed discussion of IP addressing.

Default: None.

Action: Enter your Internet address in dotted decimal format on the worksheet. Repeat this for each XRemote font server you plan to configure.

For information about subnetting parameters, refer to Table 2-1 later in this chapter.

For more information about XRemote configuration and management information, refer to the publication *Protocol Translation Configuration Guide and Command Reference*.

DECnet

DECnet is a protocol suite developed and supported by Digital Equipment Corporation. The DECnet protocol associates addresses with machines, not interfaces.

A router can have only one DECnet address. DECnet addresses are specified by area number and node number. For example, in DECnet address 53.6, DECnet node 6 is located in area 53.

An area can span many routers, and many areas can be attached to a single cable. If a DECnet host such as a router exists on many cables, its area/node address is the same on all cables. This type of addressing is called DECnet Phase IV addressing.

Default: No

Action: If you plan to use DECnet Phase IV addressing, circle Yes on the worksheet. If you do not want to use DECnet Phase IV, circle No. If you want Phase V addressing, select the Connectionless Network Services (CLNS) protocol (further down on the worksheet) in addition to circling No.

If you plan to use DECnet Phase IV addressing, provide the area number and node number, and indicate whether you want area routing. Write in values for the following:

- Area number

Area numbers are values that indicate a contiguous set of network segments.

Default: 1

Action: Assign a decimal number in the range 1 through 63.

- Node number

Each area consists of machines uniquely identified by their node number.

Default: 1

Action: Assign a decimal number in the range 1 through 1023.

- Area (Level 2) router

A DECnet router always participates in the routing protocol for its home area. However, it does not necessarily participate in the routing protocol used to get packets into other areas. Instead, it routes packets destined to other areas via an area router.

Default: No

Action: If your router will have direct connections to area routers in other areas, circle Yes. If you do not want to configure area routing, circle No.

IP and Routing Protocol

The United States Department of Defense originally defined the Internet Protocol (IP) as a standard protocol for interconnecting computers from different manufacturers on a given network. IP is now the de facto standard for vendor-independent networking.

Default: Yes

Action: If you plan to route IP, circle Yes. If not, circle No.

Select an interior routing protocol for IP. Using the **setup** command facility, you can specify only one of two interior routing protocols to operate on your system: Interior Gateway Routing Protocol (IGRP) or Routing Information Protocol (RIP). These protocols are mutually exclusive.

Note Other routing protocols are available on your router, but you cannot configure them through the **setup** command facility. You must enable them through other commands. Refer to the *Router Products Configuration Guide* for more information about the other routing protocols.

- IGRP routing

IGRP, developed by Cisco Systems, provides dynamic internetwork routing that automatically adapts to changes in network topology or status. It is especially valuable in large networks with complex topologies that consist of segments with differing bandwidth and delay characteristics.

If you plan to use IGRP routing, you must also provide an autonomous system number.

Default: Yes

Action: If you plan to route IGRP, circle Yes. If not, circle No.

- IGRP autonomous system number

An autonomous system number distinguishes different groups within a network, or *autonomous system*. The Internic agency assigns autonomous system numbers. If you are not advertising the autonomous system through external routing protocols, you can assign your own autonomous system number. The system number must be a decimal number between 1 and 65535.

Default: 1

Action: Write the system number for your autonomous system on the worksheet.

- RIP routing

RIP, used by Berkeley-derived UNIX systems, exchanges routing information dynamically among a small set of computers. Usually, all the participating machines attach to a single local area network. RIP works well for small, isolated networks with simple topologies.

During first-time startup, the **setup** command facility asks if you want RIP routing only when you specifically answer No to IGRP routing.

Default: No

Action: If you plan to configure RIP routing, circle Yes. If not, circle No.

IPX

IPX is the network protocol used by Novell's NetWare products. Your router supports IPX. For detailed information on IPX, refer to the *Router Products Configuration Guide*.

Default: No

Action: If you plan to configure IPX, circle Yes. If not, circle No.

XNS

Xerox Network Systems (XNS) was originally designed to run over Ethernet. XNS can also be routed over FDDI, Token Ring, and point-to-point serial lines. Your router supports the XNS protocol suite. For detailed information on XNS, refer to the *Router Products Configuration Guide*.

Default: No

Action: If you plan to configure XNS routing on your system, circle Yes. If not, circle No.

Note Do not enable XNS and Novell IPX at the same time, or you will have network conflicts.

AppleTalk

AppleTalk is a network protocol developed by Apple Computer. It is a client-server, or distributed, network system. Users share network resources such as files and printers with other users. Interaction with servers is transparent to the user.

Your router supports the AppleTalk network protocol (both extended and nonextended) over FDDI, Ethernet, Token Ring, synchronous serial, and X.25 interfaces. For detailed information on AppleTalk, refer to the *Router Products Configuration Guide*.

Default: No

Action: If you plan to configure AppleTalk, circle Yes. If not, circle No.

If you plan to configure AppleTalk on your router, you must also decide whether to have multizone networks.

- Multizone networks

Multiple zones are an option in AppleTalk Phase 2 (extended), but not in AppleTalk Phase 1 (nonextended). If you have Phase 2 and the internetwork compatibility flag is set to "yes," then you must *not* configure a multizone network; compatible internetworks cannot use multiple AppleTalk zones.

Default: No

Action: If you plan to configure multizone networks, circle Yes. If not, circle No.

Apollo

The Apollo Domain (Apollo) routing protocol is the native-mode networking protocol for Apollo workstations. This protocol enables an Apollo host to have interfaces on more than one physical network. Each physical network is identified by a unique 32-bit address in hexadecimal format. The address consists of a network number followed by a host number.

Your router supports packet forwarding and routing for Apollo on Ethernet, FDDI, and serial interfaces using HDLC and X.25 encapsulation. Direct attachment to the 12-Mbps Domain Token Ring is not supported.

Default: No

Action: If you plan to configure Apollo, circle Yes. If not, circle No.

If you plan to configure Apollo on your router, you must also determine the Apollo routing number.

- Apollo routing number

An Apollo routing number is the Apollo host number. This number must be a unique hexadecimal number between 1 and FFFF.

Default: 1

Action: Write the routing number you want to assign to your system on the worksheet.

CLNS

The software on your router supports packet forwarding and routing for the Connectionless Network Services (CLNS) protocol, an International Organization for Standardization (ISO) implementation. CLNS provides the basis for DECnet Phase V.

To understand CLNS routing, you need to be familiar with the hierarchical concepts of domain and area. At the top of the hierarchy is a set of routing domains. The domain address uniquely identifies the routing domain. Within each routing domain are one or more areas. The area address uniquely identifies the area. For detailed information about how your router implements CLNS, refer to the *Router Products Configuration Guide*.

Default: No

Action: If you plan to configure CLNS, circle Yes. If not, circle No.

If you plan to configure CLNS on your system, you can provide router tag, domain, area, and station ID information, or you can use default values.

- CLNS router tag

By specifying a router tag, you can refer to an area symbolically, rather than using an area address that can be hard to remember. A router tag can contain from 1 to 80 alphanumeric characters. It is not case sensitive.

Default: area_1

Action: Write your CLNS router tag on the worksheet.

- CLNS domain

Areas connected to other areas form *routing domains*. A domain can be a 1- to 22-digit hexadecimal number in the form *xx.xxxx.xxxx.xxxx.xxxx.xxxx*.

Avoid the default domain number 49, because this number is not globally unique and you will experience difficulty when connecting to other domains.

Default: 49

Action: Write your CLNS domain number on the worksheet.

- CLNS area

In the CLNS protocol, the lowest level of the routing hierarchy is the area. An area is a set of networks connected by routers. An area number is a four-digit hexadecimal number in the range 0001 through FFFF.

Default: 0001

Action: Write your CLNS area number on the worksheet.

- CLNS station ID

Each host needs a unique number; the CLNS station ID provides it. The station ID is a 12-digit hexadecimal value in the form *xxxx.xxxx.xxxx*.

Default: The default is the MAC layer address of the Ethernet interface (the lowest value is used).

Action: Write your CLNS station ID on the worksheet.

Banyan VINES

The Banyan Systems Virtual Integrated Network Service (VINES) protocol is designed for PC networks. Your router supports the VINES network protocol over all media types. For detailed information about how your router implements VINES, refer to the *Router Products Configuration Guide*.

Default: No

Action: If you plan to configure VINES, circle Yes. If not, circle No.

Bridging

Your router supports transparent and source-route bridging. The **setup** command facility allows you to configure only transparent bridging. You cannot use the **setup** command facility to configure source-route bridging. To configure source-route bridging, you must use the command interpreter. Refer to the *Router Products Configuration Guide* for information on configuring source-route bridging.

You can configure transparent bridging only if the subset image you ordered includes bridging. You can verify that your subset image has bridging capability by looking at the installed hardware banner that appears at first-time startup.

You configure bridging, like routing, for the system as a whole. That is, if you bridge a protocol, you must bridge it on *all* interfaces. For example, you cannot bridge XNS on one interface and route it on another. If you bridge XNS, you must bridge it on all interfaces. However, on the same system, you can bridge some protocols (on all interfaces) and route other protocols (on all interfaces). For example, you can bridge XNS, Vines, and AppleTalk on all interfaces, and route IP, IPX, and DECnet on all interfaces.

For more information about bridging, see the *Router Products Configuration Guide*. For more information about bridging commands, see the *Router Products Command Reference* publication.

Default: No

Action: If you plan to configure transparent bridging using, circle Yes. If not, circle No.

LAT

The local area transport (LAT) protocol from Digital Equipment Corporation (Digital) is the protocol used most often to connect to Digital hosts. LAT is a Digital-proprietary protocol. Cisco uses LAT technology licensed from Digital.

With the LAT protocol, you can establish a connection to a host, then pass your keystrokes to the host. A user can establish a LAT connection through a router running protocol translation to a Digital host, simply by entering the host name.

LAT cannot be routed because Digital's LAT protocol includes its own transport protocol (Layer 4 of the OSI reference model), which runs directly over Ethernet (Layer 2 of the OSI reference model) rather than over a standard routing layer. LAT must be bridged to pass between different network segments. The router provides the option of transporting LAT in protocol translation mode. A router with the protocol translation option can translate LAT to Telnet or X.25 for transmission over a WAN, which can be translated back to LAT on the other end of the connection.

You can configure this WAN-to-LAT translation to be transparent to the user. This configuration also avoids LAT time-out problems, which are common in WAN-bridged LAT. For more information about how your router implements LAT, refer to the *Protocol Translation Configuration Guide and Command Reference* publication.

Default: No

Action: If you plan to use LAT on this system, write Yes on the worksheet. If not, write No.

ISDN BRI Switch Type

Currently, the Cisco 2500, Cisco 3000, and Cisco 4000 series support the Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI). An ISDN BRI connection consists of two B-channels that are each treated as a single serial line. You can use the B-channels with High-Level Data Link Control (HDLC) and Point-to-Point Protocol (PPP) encapsulation. Although each channel is treated as a separate line, you cannot configure the channels separately. A single switch type must be configured for the router as a whole.

The possible switch types are as follows:

- NET3 basic rate switches in the UK and Europe (basic-net3)
- AT&T 5ESS basic rate switches (basic-5ess)
- NT DMS-100 basic rate switches (basic-dms100)
- French VN2 switches (vn2)
- French VN3 switches (vn3)
- Japanese NTT switches (ntt)
- German 1TR6 switches (basic-1tr6)
- National ISDN-1 switches (basic-nil)
- Australia switches (basic-ts013)

Default: None

Action: On the worksheet, write the value associated with the switch type you plan to configure. The valid values appear in parentheses in the list above.

Filling in the Interface Configuration Worksheet

After you complete the Global Configuration Worksheet, fill in the Interface Configuration Worksheet. You will use this information and the **setup** command facility to configure parameters for each installed interface.

The Interface Configuration Worksheet lists two levels of information:

- System hardware information
- Interface parameters

The **setup** command facility does not request system hardware information, but it is useful to write the information on your worksheet to complete your records. The **setup** facility *does* request interface parameters at first-time startup. The interface parameters depend on the decisions you make about the global parameters. For example, if you have not configured a protocol at the global level, you do not need to configure it at the interface level.

Figure 2-2 shows a sample Interface Configuration Worksheet. The “Blank Worksheets” appendix contains a blank worksheet for your convenience. Record information about your interfaces on the blank worksheets as you proceed through the following descriptions.

Note If you are installing more than four interfaces on your router, you need to make copies of the blank worksheet.

Figure 2-2 Interface Configuration Worksheet

Interface Parameters				
Interface Name				
Interface In Use (Yes/No)				
Speed (Token Ring Only)				
IP: (Yes / No)				
IP Unnumbered (Yes / No)				
Interface Name				
IP Address				
Subnet Mask Bits				
DECnet (Yes / No)				
Cost				
IPX (Yes / No)				
Network No.				
XNS (Yes / No)				
Network No.				
AppleTalk (Yes / No)				
Extended (Ethernet/Serial Only)				
Starting Cable Range				
Ending Cable Range				
Network No. (Nonextended)				
Zone Name				
Zone Name				
Zone Name				
Apollo (Yes / No)				
Network No.				
CLNS (Yes / No)				
Banyan VINES (Yes / No)				
Bridging (Yes / No)				
LAT (Yes / No)				

S2872

Recording System Hardware Information

The values for the following system hardware information should be the same as those you indicated on the Global Configuration Worksheet:

- System type
- System serial number
- Host name
- Number of interfaces

Refer to the “Determining System Hardware Information” section and the “Determining Global Parameters” section earlier in this chapter for information about these values.

Determining Interface Parameters

This section contains information about the interface parameters that you can configure through the **setup** command facility. Use this information to complete the Interface Configuration Worksheet.

In the following descriptions of the parameters that you determine, a **Default:** label marks the factory default and an **Action:** label marks your task for each parameter.

Interface Names

The **setup** command facility automatically presents each installed interface for you to configure. The facility presents the interfaces in the same order in which they are installed in the chassis. For example, if you have two Token Ring interfaces, you are prompted to configure interface TokenRing0 and then to configure TokenRing1.

The number of interfaces determines the number of columns in which you need to provide information. If you have more than four interfaces, you will need more than one worksheet.

Default: The default is the order in which the interfaces are installed in the chassis.

Action: Write each interface name across the top of the worksheet in the row labeled “Interface Name.”

Interface in Use

You can decide whether you want to configure an installed interface at first-time startup. The system shuts down the interfaces that you indicate you will not configure.

Default: No

Action: If you plan to configure a particular interface at first-time startup, write Yes in the column for that interface. If not, write No.

Token Ring Speed

If you have a Token Ring board installed, select a speed for your network. You can enter 4 to set the Token Ring speed to 4 Mbps, or 16 to set the Token Ring speed to 16 Mbps. Once you set this value, the **setup** command facility does not ask you for it again.



Caution If you select the wrong speed, the ring will be brought down.

Default: 16

Action: Write the correct Token Ring speed for your network on the worksheet.

IP Routing for an Interface

Determine whether to use IP routing for a particular interface.

Default: No

Action: If you plan to use IP routing for an interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

- IP unnumbered (serial only)

If you plan to use IP routing on a serial interface, you must determine whether it will be unnumbered.

Default: No

Action: If you plan to use IP unnumbered routing on an interface, write Yes on the worksheet. If not, write No. Repeat this for each installed serial interface you plan to configure.

- Interface name

If you selected IP unnumbered routing, you need to provide an interface name. The interface name is the name of another interface on which the router has an assigned IP address.

Default: None

Action: If you selected IP unnumbered routing, write in an interface name (such as Ethernet0) to be used by the serial interface. Repeat this for each installed serial interface.

If you plan to use IP routing on an interface, provide the IP address and subnet mask bits for that interface. Indicate values on the worksheet as follows:

- IP address

Internet addresses are 32-bit values assigned to hosts that use the IP protocols. These addresses are in dotted decimal format (four decimal numbers separated by periods) such as 192.17.5.100. Each number is an 8-bit value between 0 and 255. Refer to the *Internetworking Technology Overview* for a detailed explanation of IP addressing. The following is a summary of IP addressing concepts for those who are somewhat familiar with IP addressing.

The addresses are divided into three classes; the classes differ in the number of bits allocated to the *network* and *host* portions of the address.

The Class A Internet address format allocates the highest 8 bits to the network field and sets the highest-order bit to 0 (zero). The remaining 24 bits form the host field.

The Class B Internet address allocates the highest 16 bits to the network field and sets the two highest-order bits to 1, 0. The remaining 16 bits form the host field.

The Class C Internet address allocates the highest 24 bits to the network field and sets the three highest-order bits to 1, 1, 0. The remaining 8 bits form the host field.

Default: None

Action: Enter your Internet address in dotted decimal format for each installed serial interface you plan to configure.

- Subnet mask bits

Subnetting is an extension of the Internet addressing scheme, which allows multiple physical networks to exist within a single Class A, B, or C network. The usual practice is to use a few of the far left bits in the host portion of the network address for a subnet field. The subnet mask determines whether subnetting is in effect on a network.

Internet addressing conventions allow a total of 24 host bits for Class A addresses, a total of 16 host bits for Class B addresses, and a total of 8 host bits for Class C addresses. When you are further subdividing your network (i.e., subnetting your network), the number of host addressing bits is divided between subnetting bits and actual host address bits. You must specify a minimum of two host address bits, or the subnetwork could not be populated by hosts. Therefore, the **setup** command facility permits you to specify up to 22 host bits for Class A subnetting, 14 bits for Class B subnetting, and 6 bits for Class C subnetting. Table 2-1 provides a summary of these subnetting parameters.

Table 2-1 Summary of Subnetting Parameters

First Class	First Byte	Network Bits	Host Bits	
			Max Subnet Bits	Min Address Bits
A	1-126	8	22	2
B	128-191	16	14	2
C	192-223	24	6	2

Refer to the *Internetworking Technology Overview* for a detailed explanation of IP addressing.

Default: 0

Action: Define subnet mask bits as a decimal number between 0 and 22 for Class A addresses, 0 and 14 for Class B addresses, or 0 and 6 for Class C addresses. Do not specify 1 as the number of bits for the subnet field. That specification is reserved by Internet conventions.

DECnet for an Interface

Determine whether to use DECnet Phase IV addressing on a particular interface.

Default: No

Action: If you plan to use DECnet Phase IV addressing for the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

If you will be using DECnet Phase IV addressing on an interface, you must also provide the route cost for that interface. Indicate a value on the worksheet as follows:

- Cost

The DECnet routing protocol uses a cost value to determine favorable routing paths. The higher the cost value, the less favorable the path. To enable DECnet on an interface, you must associate a route cost with the interface.

Default: 10

Action: Write a decimal number between 1 and 63 on the worksheet. A suggested cost for the Ethernet is 4, for FDDI it is 1, for Token Ring it is 10, and for serial links it is greater than 10. Repeat this for each installed interface you plan to configure.

IPX for an Interface

Determine whether to use IPX on a particular interface.

Default: No

Action: If you plan to use IPX on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

If you will be using IPX on an interface, you must also provide the network number for that interface as follows:

- IPX network number

You must associate a network number with every network segment. An IPX network number is a 32-bit value. It must be a hexadecimal number between 1 and FFFFFFFF.

Default: The default is 1 for the first interface, 2 for the second interface, and so on.

Action: Write the IPX network number on the worksheet for each installed interface you plan to configure.

XNS for an Interface

Determine whether to use XNS on a particular interface.

Default: No

Action: If you plan to use XNS on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

If you plan to use XNS on an interface, you must also provide the network number for that interface. Indicate the information on the worksheet as follows:

- XNS network number

XNS requires that you associate a network number with every network segment. An XNS network number is a 32-bit value. It must be a decimal number between 1 and 4294967294.

Default: The default is 1 for the first interface, 2 for the second interface, and so on.

Action: Write the XNS network number on the worksheet for each installed interface you plan to configure.

Note You should not enable both XNS and Novell IPX at the same time or you will have network conflicts.

AppleTalk for an Interface

Determine whether to use AppleTalk on a particular interface.

Default: No

Action: If you plan to use AppleTalk on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

Remember, during configuration of the global parameters, you specified whether you wanted to configure multizone networks. Your answer applies to every interface you configure.

If you plan to use AppleTalk on an interface, you must also provide the other information for that interface as follows.

- Extended AppleTalk

Extended AppleTalk networks, a feature of AppleTalk Phase 2, support Token Ring and FDDI protocols and assign a node to a cable range instead of to a single network number. Token Ring and FDDI interfaces are automatically configured for extended AppleTalk networks; therefore, this field applies to Ethernet and serial interfaces only.

Default: No

Action: If you plan to use extended AppleTalk on the interface, write Yes on the worksheet. If not, write No.

Note If you answer **Yes**, you need to specify the starting and ending cable ranges and multiple AppleTalk zone names. If you answer **No**, specify the AppleTalk network number and a single AppleTalk zone name.

- AppleTalk starting cable range

A cable range specifies a contiguous list of network numbers from which nodes can dynamically assign their addresses. If you have a network with fewer than 100 nodes connected to the same network, you can specify a cable range with the same starting and ending value. If you want the router to obtain its configuration from an existing router directly connected to the segment, specify the value 0.

If you specify the value 0, you do not need to provide an ending cable range or AppleTalk zone name. A starting cable range value must be a decimal number between 0 and 65279.

Default: 0

Action: Write the starting cable range on the worksheet.

- AppleTalk ending cable range

An ending cable range value must be a decimal number between 4 and 65279.

Default: The default is the value assigned to the starting cable range.

Action: Write the ending cable range for the extended AppleTalk network on the worksheet.

- AppleTalk network number

Nonextended AppleTalk networks require AppleTalk network numbers. An AppleTalk network number is a 16-bit value. AppleTalk Phase 2 requires that a network number be associated with every network segment.

A network number must be a decimal number between 0 and 65279.

Default: The default is 1 for the first interface, 2 for the second interface, and so on.

Action: Write the AppleTalk network number on the worksheet. Repeat this for each installed interface you plan to configure.

- AppleTalk zone name

An AppleTalk zone name merges arbitrary networks into a single logical collection of services for network users. Take care to assign zone names that are meaningful to users who are not necessarily familiar with the network. Examples of meaningful names include MIS, Menlo Park, and Third Floor. Examples of nonmeaningful names include EtherTalk, T1-Serial, and BOS-12.

Multiple networks can share the same zone name. For Token Ring and FDDI interfaces as well as others for which you specified an extended network, you can enter multiple zone names. When you have entered the final zone name and want to view the next prompt, simply press Return.

Default: myzone

Action: Write the AppleTalk zone name(s) on the worksheet. Repeat this for each installed interface you plan to configure.

Apollo for an Interface

Determine whether to use Apollo Domain (Apollo) addressing on a particular interface.

Default: No

Action: If you plan to use Apollo addressing on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

If you plan to use Apollo on an interface, you must also provide the network number for that interface as follows:

- Apollo network number

An Apollo network number is a 32-bit value. It must be a hexadecimal number between 1 and FFFFFFFF.

Default: 1

Action: Write the Apollo network number for each installed interface you plan to configure on the worksheet.

CLNS for an Interface

Determine whether to use CLNS on a particular interface.

Default: No

Action: If you plan to use CLNS on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

Banyan VINES for an Interface

Determine whether to use Banyan VINES on a particular interface.

Default: No

Action: If you plan to use VINES on the interface, write Yes on the worksheet. If no, write No. Repeat this for each installed interface you plan to configure.

Bridging for an Interface

Determine whether to use transparent bridging on a particular interface. (Remember that you cannot use the **setup** command facility to configure source-route bridging. To configure source-route bridging, you must use the command interpreter. Refer to the *Router Products Configuration Guide* for information on configuring source-route bridging.)

Default: No

Action: If you plan to use transparent bridging on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

LAT

The local area transport (LAT) protocol from Digital Equipment Corporation (Digital) is the protocol used most often to connect to Digital hosts. LAT is a Digital-proprietary protocol. Cisco uses LAT technology licensed from Digital.

With the LAT protocol, you can establish a connection to a host, then pass your keystrokes to the host. A user can establish a LAT connection through a router running protocol translation to a Digital host, simply by entering the host name.

Default: No

Action: If you plan to use LAT on the interface, write Yes on the worksheet. If not, write No. Repeat this for each installed interface you plan to configure.

Note If you configure LAT for an interface, the Digital Maintenance Operation Protocol (MOP) is automatically configured as well. If you do not configure LAT for an interface, MOP is not configured for that interface.

After you complete the Interface Configuration Worksheet, go on to the “First-Time Startup” chapter.

