

Preparing for First-Time Startup

This chapter provides the information you need to 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 to the 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 provides information to help you complete the following tasks:

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

The parameters and values on these 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 process, Configuring Global Parameters, you specify *global* or system-wide configuration information. You use the values you have recorded on the Global Configuration Worksheet.

In the second part, Configuring Interface Parameters, you configure each individual interface. You use the values you have recorded on the Interface Configuration Worksheet.

Use the blank configuration worksheets in the “Blank Worksheets” appendix to record values for the parameters, 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.

In the following descriptions of the parameters that you will determine, the factory default is marked with the **Default:** label, and the action you take to fill in the worksheet is marked with the **Action:** label.

Filling in the Global Configuration Worksheet

The Global Configuration Worksheet, if properly filled in, will contain all the values you need to enter at the Configuring Global Parameters portion of 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 up and running quickly and uneventfully.

Use the worksheet to gather and maintain information about your system. You record two levels of information on the Global Configuration Worksheet:

- System hardware information
- Global parameters

System hardware information is *not* requested at first-time startup, but is useful to note on the Global Configuration Worksheet, to complete your records. Global parameters, however, *are* requested 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 so that as you proceed through the following descriptions, you can 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.

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: _____		

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Figure 2-1 Global Configuration Worksheet

Determining System Hardware Information

Use this section to determine system hardware information and record the information on the Global Configuration 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 is useful for tracking your physical inventory.

Default: None

Action: Write your system serial number on the worksheet.

Number of Interfaces

The number of interfaces depends on the type of system you have and the number of interface cards you have installed. The number of interfaces is determined when you order a system, so if you are installing a new system, it will have been preconfigured at the factory. Check the back of your router to determine 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 can be configured through the **setup** command facility. 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.

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 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, these commands should be password-protected to prevent unauthorized use.

The enable password allows users access to the privileged command level. There is no 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, the system responds to attempted connections by displaying an error message and closes the connection. (Virtual terminals are used when you access the router remotely via the Telnet or DEC MOP protocols.)

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 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.

You can allow line connections without a password if you want. Refer to the *Router Products Configuration Guide* or the *Router Products Command Reference* publication for more information.

Default: None

Action: Write your virtual terminal password on the worksheet.

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.

SNMP is configured on a global basis only; it cannot be specified 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.

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 fonts used by X applications are not included in ROM on the NCD terminal, one or more font servers must be identified from which the protocol translator 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.

Default: No

Action: If you want to configure one or more XRemote font servers, circle Yes on the worksheet. If not, circle No.

If you plan to use one or more XRemote font servers, you must also provide an IP address for each one. This step is equivalent to specifying the IP address of a font server using the **xremote tftp host** configuration command. However, you cannot specify an XRemote host name through the **setup** command facility because the name service facility is not yet running.

Indicate an IP address on the worksheet for each XRemote font server as follows:

- IP address for the XRemote font server

Internet addresses are 32-bit values assigned to hosts that use the IP protocols. These addresses are written 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.

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 form (for example, 131.108.2.5) on the worksheet. Repeat this for each installed serial interface you plan to configure.

Table 2-1 provides a summary of subnetting parameters.

Table 2-1 Summary of Subnetting Parameters

First Class	First Byte	Network Bits	Host Bits
A	1-126	8	24
B	128-191	16	16
C	192-223	24	8

For more information about XRemote configuration and management information, refer to the publication *Protocol Translator 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. Therefore, if a DECnet host such as a router exists on many cables, its area/node address is the same. 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 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) routing

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 Internet Protocol (IP) was originally defined by the United States Department of Defense 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: Circle Yes if you plan to route IP. If not, circle No.

Select an interior routing protocol for IP. You can specify only one interior routing protocol to operate on your system using the **setup** command facility: 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

Autonomous system numbers are usually assigned by the Internic agency. An autonomous system number is used to distinguish different groups within a network, or *autonomous system*. The system number must be a decimal number between 1 and 65535.

Default: 1

Action: Write in the system number you want to assign to your system.

- RIP routing

RIP is used by Berkeley-derived UNIX systems to exchange 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, you are not asked whether you want RIP routing unless you specifically answer No to IGRP routing.

Default: Yes

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, 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, 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.

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, 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 FFFFE.

Default: 1

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

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 is 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: Yes

Action: Circle Yes if you plan to configure CLNS. 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 in your CLNS router tag.

- CLNS domain

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

Avoid the default domain number 49, because your 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.xxx.xxx*.

Default: The default is based on 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. However, you can only configure transparent bridging using the **setup** command facility.

You can configure transparent bridging only if your system has bridging software installed. To determine whether your system has bridging capability, look at the installed hardware banner displayed at the first-time startup. Bridging, like routing, is configured for the system as a whole. That is, if a protocol is being bridged, it must be bridged on *all* interfaces. You cannot route IP on one interface and bridge it on another.

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

Default: No

Action: If you plan to configure transparent bridging (and bridging software has been ordered and installed), 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 the protocol translator 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 protocol translator 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 protocol translator implements LAT, refer to the *Protocol Translator Configuration Guide and Command Reference* publication.

Default: Yes

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

ISDN BRI Switch Type

The Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) is currently supported on the Cisco 2500 and Cisco 3000 only. An ISDN BRI connection is made up 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 must provide information about each installed interface during the Configuring Interface Parameters portion of the **setup** command facility. If you fill in the Interface Configuration Worksheet properly, you will have all the information you need to perform this task.

Two levels of information are listed on the Interface Configuration Worksheet: system hardware information and interface parameters. System hardware information is not requested at first-time startup, but is useful to write on the worksheet to complete your records. Interface parameters, however, are requested at first-time startup. The interface parameters depend on the decisions you make about the global parameters. For example, if you do not configure a protocol at the global level, you do not need to configure it at the interface level.

The Interface Configuration Worksheet is shown in Figure 2-2, and a blank worksheet is provided in the “Blank Worksheets” appendix. Record the information on it as you proceed through the following descriptions.

Note If you are installing more than four interfaces on your router, you will need more than one Interface Configuration Worksheet. You can make copies of the blank worksheet provided.

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)				

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Figure 2-2 Interface Configuration Worksheet

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 can be configured through the **setup** command facility. Use this information to complete the Interface Configuration Worksheet. In the following descriptions of the parameters that you will set, your task for each parameter is marked with the **Action:** label.

Interface Names

The **setup** command facility automatically presents each installed interface for you to configure. The interfaces are presented in the same order as 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 based on the interfaces installed in the chassis.

Action: Write each interface name across the top of the worksheet in the row labeled “Interface Name.” Repeat this for each installed interface you plan to configure.

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: Yes

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: Yes

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 usually written 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.

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 form (for example, 131.108.2.5) for each installed serial interface you plan to configure.

Table 2-2 provides a summary of subnetting parameters.

Table 2-2 Summary of Subnetting Parameters

Class	First Byte	Network Bits	Host Bits
A	1-126	8	24
B	128-191	16	16
C	192-223	24	8

- 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 controls whether or not subnetting is in effect on a network.

Internet addressing conventions allow 24 bits for a Class A address, 16 bits for a Class B address, or 8 bits for a Class C address. However, because the last two of these bits are used for the host address, the **setup** command facility allows you to specify up to 22, 14, or 6 bits for your subnet mask.

Default: 0

Action: Subnet mask bits should be defined 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 of the installed interfaces 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

To enable DECnet on an interface, a route cost must be associated with the interface. This cost is used by the DECnet routing protocol to determine favorable paths.

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.

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

An XNS network number is a 32-bit value. XNS requires that a network number be associated with every network segment. 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.

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

A IPX network number is a 32-bit value. You must associate a network number with every network segment. 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.

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: None

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

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

AppleTalk network numbers are required for nonextended AppleTalk networks. 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 unmeaningful 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: The default is myzone.

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

CLNS for an Interface

Determine whether to use CLNS on a particular interface.

Default: Yes

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: Yes

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.

Default: Yes

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 the protocol translator to a Digital host, simply by entering the host name.

Default: Yes

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.