Preparing for First-Time Startup

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

By preparing for first-time startup, you can take advantage of the full range of configurations available on the server product. 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 server product's system console port, as described in the "Overview" chapter. By separating the planning tasks from the configuration tasks, you can set up the server product in one sitting. You can also tailor it to meet your needs and to fit within a consistent 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 server product. If you plan to install more than one server product, 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 server product, make additional copies of the blank worksheet.

You use these worksheets to help gather and maintain information about your server product. 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 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 server product enables you to get your system up and 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 and Figure 2-2 show a sample Global Configuration Worksheet. Retrieve the blank, two-page Global Configuration Worksheet from the "Blank Worksheets" appendix before continuing. As you proceed through the following descriptions, record your information on it. Be sure to record information on both pages before powering up your server product for the first time.

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 XNS 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 level.

Figure 2-1   Global Configuration Worksheet, Part 1

System Type: ASM-CS   Cisco 2500

Other: _____

System Serial No.: _____   **Number of Synchronous Interfaces:** _____

Number of Async Lines: _____

Global Parameters, Part 1

Host Name:			
Enable Secret:			
Enable Password:			
Virtual Terminal Password:			
SNMP:	Yes	No	
DECnet: (Cisco 2500 Only)	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: (Cisco 2500 Only)	Yes	No	
AppleTalk:	Yes	No	
Multizone:	Yes	No	
Apollo: (Cisco 2500 Only)	Yes	No	
Routing No.: _____			
CLNS: (Cisco 2500 Only)	Yes	No	
Router Tag: _____			
Domain: _____			
Area: _____			
Station ID: _____			
Banyan VINES: Yes No (Cisco 2500 Only)			
Bridging: Yes No (Cisco 2500 Only)			

S3073

Figure 2-2   Global Configuration Worksheet, Part 2

Global Parameters, Part 2

Async Lines:	**Yes**	**No**
Async Line Speed:		
Hardware Flow Control:	**Yes**	**No**
Modems:	**Yes**	**No**
Default Chat Script:	**Yes**	**No**
Dail-in SLIP/PPP:	**Yes**	**No**
Dynamic IP Address:	**Yes**	**No**
Default IP Addresses:	**Yes**	**No**
TCP Header Compression:	**Yes**	**No**
Routing Updates:	**Yes**	**No**
Async IPX?	**Yes**	**No**
XRemote Font Server:	**Yes**	**No**
	IP Address: _____	
	IP Address: _____	
	IP Address: _____	
	IP Address: _____	
AppleTalk Remote Access:	**Yes**	**No**
AppleTalk Network for ARA Clients: _____		
Zone Name for ARA Clients: _____		

S3074

Determining System Hardware Information

Use this section to record system hardware information on your 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

Our server products accommodate a wide variety of needs. Customers can choose among the following system types:

- ASM-CS

- 500-CS

- Cisco 2509

- Cisco 2510

- Cisco 2511

- Cisco 2512

All our systems provide protocol translation. The ASM-CS and 500-CS provide asynchronous routing for IP and IPX. The Cisco 2500 features full routing capability, in addition to its communication server functionality.

Note The factory installs configurations for an ASM-CS chassis according to customer specifications. If you have an existing ASM-CS system and want to change the factory preconfigurations, you need to order the card separately and consult the configuration notes accompanying the new component for installation instructions.

Default: None.

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

System Serial Number

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

Default: None.

Action: Write your system serial number on the worksheet.

Number of Synchronous Interfaces

When you order your server product, you specify the number and type of synchronous interfaces, such as Ethernet, Token Ring, or synchronous serial interfaces, that the server product should have. The factory preconfigures your new server product with this information.

Check the back of your system to verify that your server product has synchronous interfaces you ordered.

Default: None.

Action: Write the number of interfaces on the worksheet.

Number of Asynchronous Lines

The number of asynchronous lines depends on the type of server product you have. If you have a 500-CS or a Cisco 2500, you can have 8 or 16 asynchronous terminal lines. If you have an ASM, you can have 16 to 112 asynchronous lines (in increments of 16). Again, when you order your server product, you specify the number of asynchronous lines for the server. The factory preconfigures your server with the specified number of asynchronous lines.

Check the back of your system to verify the number of asynchronous lines.

Default: None.

Action: Write the number of interfaces on the worksheet.

Determining Global Parameters

This section contains information about each global parameter 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 the server product. The name you specify is used in the 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, " 500cs" is interpreted as "500cs" (without the space).

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

Default: CS (for the 500-CS and ASM-CS) or Router (for the Cisco 2500).

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

Enable Password

Your system has two default levels of security: user and privileged. The commands available at the user level are a subset of those available at the privileged level. Because many privileged-level 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; a number cannot be the first character. Spaces are also valid password characters; for example, "two words" is a valid password. Leading spaces are ignored, though trailing spaces are recognized. For example, " woolly" is interpreted as "woolly" (without the space). On the other hand, "woolly " is recognized as "woolly " (with the space).

For more information about enable passwords, refer to the *Access and Communication Servers Configuration Guide* or the *Access and Communication Servers Command Reference* publication.

Default: None.

Action: Write an enable password on the worksheet.

Virtual Terminal Password

In addition to the enable password, each 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. (Virtual terminal lines are used when you access the server product remotely via the network.)

A virtual terminal password can contain from 1 to 80 uppercase and lowercase alphanumeric characters; a number cannot be the first character. Some spaces are also valid password characters. For example, "two words" is a valid password. Leading spaces are ignored, though trailing spaces are recognized. For example, " woolly" is interpreted as "woolly" (without the space). On the other hand, "woolly " is recognized 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 *Access and Communication Servers Configuration Guide* and *Access and Communication Servers Command Reference* publication for more information on disabling passwords. Refer to the *Cisco Access Connection Guide* to make line connections.

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

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 since 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.

DECnet (Cisco 2500 Only)

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

An access server can have only one DECnet address. DECnet addresses consist of 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 access servers, and many areas can be attached to a single cable. If a DECnet host such as a server 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 of the access server, 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 access server 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 access server 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.

  Default: Yes.

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

- IGRP autonomous system number

  If you will be using IGRP routing, you also need to provide an 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 server product supports IPX. For detailed information on IPX, refer to the *Access and Communication Servers Configuration Guide*.

Default: No.

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

XNS (Cisco 2500 Only)

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 access server 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 IPX at the same time, or you will have network conflicts.

AppleTalk Routing

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 server product 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 *Access and Communication Servers Configuration Guide*.

If you want to enable AppleTalk Remote Access on your server product, you must first configure AppleTalk routing.

Default: No.

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

If you plan to configure AppleTalk on your server product, 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 (Cisco 2500 Only)

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 access server 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 access server, 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 the routing number you want to assign to your system on the worksheet.

CLNS (Cisco 2500 Only)

The software on your access server 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 access server 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 represented by 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 (Cisco 2500 Only)

The Banyan Systems Virtual Integrated Network Service (VINES) protocol is designed for PC networks. Your access server supports the VINES network protocol over all media types. For detailed information about how your access server 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 (Cisco 2500 Only)

Your access server 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, 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, 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 server product 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 server product provides the option of transporting LAT in protocol translation mode. A server product 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 server products 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. If not, write No.

Async Lines

You can use the **setup** command facility to configure the asynchronous (async) lines on your server product at first-time startup.

Default: Yes.

Action: If you plan to configure your async lines, Circle Yes on the worksheet. If not, circle No.

The parameters that you can configure for async lines at the global level include the following:

- Async line speed

- Hardware flow control

- Modems

- Default chat scripts

- Dial in SLIP and PPP, including several parameters

  — Dynamic IP addresses

  — Default IP addresses

  — TCP header compression

  — Routing updates

- Configure for Async IPX

- XRemote font servers

- XRemote font server IP addresses

- Configure for AppleTalk Remote Access, including the following parameters:

  — AppleTalk Network for ARA clients

  — Zone name for ARA clients

We recommend that you globally set each parameter with the **setup** command facility, then configure the lines individually after you complete this process.

Async Line Speed

The asynchronous lines on your server product support several transmission speeds. This parameter sets both the transmit (to terminal) and receive (from terminal) speeds. Table 2-1 lists the available line speeds for each server product model.

Table 2-1   Server Product Line Speeds in Bits per Second

Server Product	Line Speeds
500-CS	Any speed between 50 and 38400
ASM-CS standard	75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 11520, 12800, 14400, 19200, 23,040, 28800, 38400, and 57600
Cisco 2500	Any speed from 50 to 115200

Default: 9600.

Action: Write the terminal line speed of your choice on the worksheet.

Hardware Flow Control

Configure your lines for hardware flow control if an async device (such as a modem) or communications protocol requires it. If you are configuring your lines for AppleTalk Remote Access (ARA), you *must* enable hardware flow control. ARA does not function with software flow control. SLIP lines explicitly turn off software flow control when a server product enters protocol mode on a line. Choosing this option has the same effect as issuing the **flowcontrol hardware** command in line configuration mode.

Default: Yes.

Action: If you plan to enable hardware flow control on your lines, circle Yes. If not, circle No.

Modems

You can configure your server product to support only incoming calls from modems, only outgoing calls to modems, or both incoming and outgoing modem calls. Using the **setup** command facility, you can configure your server product to support both incoming and outgoing calls on all async lines or you can configure your server product for no modem support. To configure your server product for only incoming or only outgoing modem calls, you must use the command interpreter. Refer to the *Access and Communication Servers Configuration Guide* for more information on configuring modem lines for a single direction.

You can also restrict the direction of modem calls by adjusting the configuration of the modem itself. Refer to the modem manual for details.

Note   Cisco Systems recommends configuring modem lines for both incoming and outgoing calls, regardless of whether the lines will be used for communications in both directions.

Choose Yes to enable both incoming and outgoing modem calls. (You can produce the same effect by entering the **modem inout** command in line configuration mode.) Choose No for no modem support.

Default: Yes/No. You must choose Yes or No before continuing to the next prompt.

Action: If you plan to support both incoming and outgoing calls on your async lines, circle Yes on the worksheet. If you do not want modem support for your server product, circle No.

Default Chat Script

You must define a chat script for dialing out on asynchronous lines. The **setup** command facility can assign a default chat script on a global basis. You can use this chat script in more complex dial-on-demand routing configurations for modem dialing. Enabling this feature has the same effect as the process of entering global configuration mode on your system; entering a **chat-script** command at the command prompt; issuing a regular expression; and then entering line configuration mode and issuing a **script-dialer** command. The following line, which is a chat script named cisco-default, is entered into your system's global configuration:

```
chat-script cisco-default ABORT ERROR "" "AT Z" OK "ATDT \T" TIMEOUT 30 \c CONNECT
```

Default: Yes.

Action: If you plan to use the default chat script cisco-default on your system, circle Yes. If not, circle No.

Dial-in IP SLIP/PPP Access

Use the **setup** command facility to permit dial-in IP access with the Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP) from within EXEC mode. The alternative is dedicated asynchronous mode, which does not enable use of the **slip** and **ppp** from within EXEC mode. Enabling this option has the same effect as issuing the **async mode interactive** command from within interface configuration mode for each asynchronous interface on your system.

Default: No.

Action: If you plan to permit dial-in SLIP and PPP access from EXEC mode, circle Yes. If not, circle No.

Dynamic IP Addresses

This option specifies that users dynamically assign IP addresses. That is, a user can specify an IP address (or name) of a remote network host at the EXEC level when making a connection using the **slip** or **ppp** EXEC command. Enabling this option has the same effect as issuing the **async dynamic address** command from within interface configuration mode.

Default: Yes.

Action: If you plan to permit users to specify IP addresses at connection time, circle Yes. If not, circle No.

Default IP Addresses

This option specifies that a default IP address can be used when a connection is made to a remote network device (such as a PC). That is, the user does not have to enter an IP address when connecting to the device, because the default IP address has been set in the configuration. Selecting this option has the same effect as issuing the **async default ip address** command from within interface configuration mode. If you set this parameter in global configuration mode of the **setup** command facility, the interface configuration portion of the **setup** command facility prompts you for specific default client IP addresses for each interface.

Default: No.

Action: If you plan to have the server product specify the IP address at connection time, circle Yes. If not, circle No.

TCP Header Compression

Your server product supports Van Jacobsen TCP header compression on asynchronous lines. On SLIP and PPP lines, this option prevents transmission of compressed packets until one of the following events occurs:

* A compressed packet is received on the async link.

* A user issues the **slip /compressed** or **ppp /routing** command at the command line. Refer to the *Cisco Access Connection Guide* for more information on these commands.

Answering Yes has the same effect as entering the **ip tcp header-compression passive** command from within interface configuration mode. For more information about this command, refer to the *Access and Communication Servers Command Reference* publication.

Default: Yes.

Action: If you plan to enable header compression on SLIP and PPP lines, circle Yes. If not, circle No.

Routing Updates

Routing updates can use a great deal of bandwidth, but most asynchronous links have very low bandwidth. Selecting No for this option prevents routing updates from being sent on your async lines. Selecting this option has the same effect as issuing the **async dynamic routing** command from within interface configuration mode.

Default: No.

Action: If you plan to permit routing updates on your async lines, circle Yes. If not, circle No.

Configure for Async IPX

Your server product supports routing of IPX packets across asynchronous lines. If you want to permit routing of IPX packets, enable this option.

Default: Yes.

Action: If you plan to permit IPX routing on async lines, circle Yes. If not, circle No.

XRemote Font Servers

Your server product supports the Network Computing Device, Inc. XRemote feature on all access and communication servers. 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 server product and the NCD terminal can obtain fonts. You can identify as many XRemote font servers as you need; it is unlikely that you will ever reach the maximum number that the software allows you to identify.

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 2-2 later in this chapter.

For more information about XRemote configuration and management information, refer to the *Access and Communication Servers Configuration Guide*. For information about making XRemote connections, refer to the *Cisco Access Connection Guide*.

AppleTalk Remote Access

You can configure your server product as an AppleTalk Remote Access (ARA) server. Cisco's implementation of ARA gives Macintosh users at remote locations direct access to information and resources. Macintosh users can connect to other Macintosh computers or an AppleTalk network over standard async telephone lines.

Configuring your server product to act as an ARA server allows remote Macintosh users to dial in, become a network node, and connect to devices on other networks. For additional information about ARA, refer to the *Access and Communication Servers Configuration Guide* or the *Access and Communication Servers Command Reference* publication.

Default: Yes.

Action: If you plan to configure your server product as an ARA server, circle Yes. If not, circle No.

AppleTalk Network for ARA Clients

This parameter creates a pseudo network and network number, which exist only inside the server product. All ARA clients must belong to this pseudo network. The server product advertises the network number as if it is an existing AppleTalk network.

Selecting this option is equivalent to entering the **arap network** [**net-number**] command in global configuration mode. For more information about this command, refer to the *Access and Communication Servers Command Reference* publication.

Default: 1.

Action: Write the number of the AppleTalk network for ARA clients on the worksheet.

Zone Name for ARA Clients

This parameter specifies the zone name for a pseudo AppleTalk network, which also exists only inside the server product. The server product automatically places all ARA clients in the network with this zone name and advertises the zone name as if it is an existing AppleTalk network.

Selecting this option is equivalent to entering the **arap network** [**zone-name**] command in global configuration mode. For more information about this command, refer to the *Access and Communication Servers Command Reference* publication.

Default: * (asterisk).

Action: Write a meaningful AppleTalk zone name on the worksheet.

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 2-3 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 server product, you need to make copies of the blank worksheet.

Figure 2-3   Interface Configuration Worksheet

System Hardware Information:

System Type: _____ **System Serial No.:** _____ **Host Name:** _____ **No. of Synchronous Interfaces:** ____

No. of Async. Lines: _____

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: (Cisco 2500 Only)				
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. (Cisco 2500 Only)				
CLNS (Yes / No) (Cisco 2500 Only)				
Banyan VINES (Yes / No) (Cisco 2500 Only)				
Bridging (Yes / No) (Cisco 2500 Only)				
LAT (Yes / No)				
IPX Network No. (Async Lines Only)				
Default IP Client Address: (Async Lines Only)				

S3072

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 synchronous interfaces

- Number of asynchronous lines

Refer to the "Determining Global Parameters" section earlier in this chapter for information about these values.

Determining Interface Parameters

This section contains information about each interface parameter that you can configure through the **setup** command facility for the installed network. Use this information to complete the Interface Parameters portion of the 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 prompts for interface information in the same order in which the interfaces are installed in the chassis. For example, if you have two Ethernet interfaces, the facility prompts you to first configure interface Ethernet0 and then to configure Ethernet1.

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. If at first-time startup you accept the configuration script, the system shuts down the interfaces 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 (Cisco 2500 Only)

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 (synchronous serial only)

  If you plan to use IP routing on a synchronous 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. 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 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 controls 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 2-2 provides a summary of these subnetting parameters.

Table 2-2   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 Routing for an Interface (Cisco 2500 Only)

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

  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 use 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 (Cisco 2500 Only)

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 you to 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 Routing for an Interface

Determine whether to use AppleTalk on a particular interface. You must enable AppleTalk on at least one network interface for AppleTalk Remote Access to function on the server product's asynchronous lines.

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 instead of a single network number to a cable range. 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 you to associate a network number 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 (Cisco 2500 Only)

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 will 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 in the Apollo network number for each installed interface you plan to configure.

CLNS for an Interface (Cisco 2500 Only)

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 (Cisco 2500 Only)

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 (Cisco 2500 Only)

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 for the Interface

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 LAT, you can establish a connection to a host, then pass your keystrokes to the host. A user can establish a LAT connection through the server product to a Digital host simply by entering the host name.

The server product provides the option of transporting LAT in protocol translation mode. You can configure the server product software to translate LAT to Telnet or X.25 for transmission over a WAN. Telnet or X.25 is then 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 LAT, refer to the *Access and Communication Servers Configuration Guide*.

Default: Yes.

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

IPX for Asynchronous Lines

For IPX, you must associate a network number with every network segment. Specify the IPX network number for each asynchronous line. An IPX network number is a 32-bit value. It must be a hexadecimal number between 1 and FFFFFFFF.

Default: The default is 3 for the first async line, 4 for the second async line, and so on.

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

Default Client IP Address for an Interface

If you specified on the Global Configuration Worksheet that a default IP address be used for each async line when a connection is made to a remote network device (such as a PC), then specify on the Interface Configuration Worksheet the specific default IP address for each async interface.

A default client IP address means that users do not have to enter an IP address when connecting to a device, because you have set the default IP address in the configuration. Specifying a default client IP address limits user access from a particular async interface to specific devices.

Default: None.

Action: If you plan to configure a default client IP address for an async interface, write the IP address for each async interface on the worksheet. Note that if you enter an address for one async interface, the **setup** command facility increments the IP address one digit for each subsequent async interface. You can accept the default increments or change the IP addresses as you like.