1 *Using This Manual to Plan Your Network*

Whether you want to use your NEXTSTEP™ computer as a standalone system or connect it to a network, this manual contains information you need. If you want to set up your NEXTSTEP computer for multiple users, attach a peripheral device, or incorporate it into a mixed network, you'll find the procedures to follow in this guide. It's not a comprehensive reference for all aspects of system administration; rather, it's a basic guideÐa starting pointÐfor setting up NEXTSTEP computers in a variety of configurations.

This chapter is designed to help you get started with this manual. It's also intended to help you create a network plan, which is the first step in setting up a network. You can use this chapter as an introduction to networking and as a planning resource when you're ready to design your network.

How to Use This Manual

This section gives you a synopsis of each chapter and describes some of the conventions used.

Chapter Descriptions

What follows is a brief description of the information in each chapter, including a brief note as to updates made for NEXTSTEP Release 3.3 (note that no updates have been made for Release 4.0):

- Chapter 1, ªUsing This Manual to Plan Your Network,º discusses issues you should consider when designing your network and gives an overview of some available hardware configurations. The Release 3.3 edition updates information on NetInfo.

- Chapter 2, ªSetting Up a NetInfo Network,º covers the steps you perform to set up a simple network, including configuring servers, sharing files, and creating user accounts. The Release 3.3 edition presents information including new features of SimpleNetworkStarter.

- Chapter 3, ªNetInfo Networking,º introduces NetInfo™, the NEXTSTEP administrative database service, and describes how to configure various aspects of your network. The Release 3.3 edition updates information on NetInfo.

- Chapter 4, ªSetting Up the Network File System,º describes how to share files over the network.

- Chapter 5, ªManaging User Accounts and User Groups,º covers creating and deleting user accounts and user groups. The Release 3.3 edition presents information including new features of UserManager.

- Chapter 6, ªManaging Electronic Mail,º covers configuring mail service and creating mail aliases.

- Chapter 7, ªAttaching Peripherals,º presents information about connecting external disk drives, modems, and other peripherals.

- Chapter 8, ªManaging System Backups,º explains how to back up and restore data.

- Chapter 9, ªSystem Startup and Shutdown,º describes what happens when you start up and shut down your computer. The Release 3.3 edition presents information on Intel-based PCs running NEXTSTEP.

- Chapter 10, ªConfiguring a Large Network,º describes how to work with a large NetInfo network, including subnetting and NetInfo hierarchies of more than two levels. The Release 3.3 edition updates information on NetInfo.

- Chapter 11, ªNEXTSTEP Computers in a Mixed Network,º explores how to integrate NEXTSTEP computers with several types of networks that include non-NEXTSTEP computers.

- Chapter 12, ªTaylor UUCP,º is about Taylor UUCP and how to set it up on a NEXTSTEP computer.

- Chapter 13, ªNetBooting,º describes how to set up NetBoot clients, which can boot over the network.

- Chapter 14, ªSecurity,º is a detailed discussion of security issues and how they affect the administration of your system.

- Chapter 15, ªGeneral Troubleshooting,º discusses several UNIX®commands that can be useful when you're tracking down a problem.

- Appendix A, ªThe Manager Applications,º is a command reference for the administration applications.

- Appendix B, ªCable and Modem Configuration,º describes several cables for use with a NeXT computer and also provides some sample modem settings.

- Appendix C, ªInternet Addressing,º explains how to obtain and assign an appropriate Internet address.

- Appendix D, ªThe **sendmail** Program,º describes the contents of the configuration files used to manage electronic mail.

- Appendix E, ªSystem Test Error Codes,º defines the error codes you might encounter when starting up a NeXT computer.

- Appendix F, ªThe Terminal Application,º gives a brief overview of Terminal (located in /NextApps).

- Appendix G, ªAnnotated **uucico** Debugging Output,º provides an example of a debugging session used to track down problems with UUCP.

- Appendix H, ªSuggested Reading,º describes sources of additional information.

Conventions

In certain places in this manual, you're directed to enter a command in a shell window. You use the Terminal application to do this. In this manual, the word *directory* is used in place of the word *folder* found in other NeXT documentation.

Planning Your Network

Networking is a way of sharing computer resources among users. These shared resources can include equipment (such as printers and fax modems), files, and data or administrative services.

Network servers provide users with access to these resources. For example, a print server lets a work group share a printer. An NFS®file server allows users throughout the network to access files as though the files were on their own local computers. A NetInfo server lets you store administrative data for multiple systems in a single place, reducing the time required to maintain the database.

NetInfo administration is based on the concept of *domains*. A NetInfo domain is an abstract collection of administrative information about a group of computers and the resources to which they have access. For example, a NetInfo domain can contain the administrative information for a single computer, a department, or even an entire company. You should associate NetInfo domains with groups of computers that need to be administered together. This is typically along organizational linesÐfor example, small work groups, departments, or divisions.

NetInfo domains are linked together in a hierarchy much like the UNIX file system. Each level in the hierarchy is called a *domain level*. You can make selected information available to specific domain levels. The size and complexity of your network often determines the number of domain levels.

NEXTSTEP computers come with a set of uncomplicated yet powerful networking applications, called collectively the Manager applications, which reside in the **/NextAdmin** directory. These applications let you implement your network to meet your requirements. You can set up your network as a hierarchyÐperhaps based on your company organizationÐthat lets you share some resources with small groups and make other resources available throughout the network. A printer might be shared among four computers, while a single mail server could route electronic mail to the entire company.

When designing your network, you need to consider:

· GoalsÐWhat resources do you want to share, and with whom? What resources do you want to keep private? What level of security do you want to maintain?

· LimitationsÐWhat limitations do you need to consider in implementing your design? These might include budget, physical location, available space, or convenience of use and administration.

· ResourcesÐWhat can you use to implement your design? NEXTSTEP computers are compatible with a wide variety of network options, allowing you the flexibility to choose from several possible solutions.

For example, suppose your goal is to connect your NEXTSTEP network to an existing network in another division of your company. Your NEXTSTEP network may be based on Ethernet while the other is based on token ring. One solution to this problem would be a gateway to translate messages from one architecture to the other.

If you intend to use your NEXTSTEP computer as a standalone system, little planning is neededÐyou simply set it up and it runs. However, when creating a network serving multiple users, your decision-making process can be complex.

Through careful network design, you can:

· Create the correct load balancing of server systems and users' systems.
· Design the right mix of computers and peripherals for maximum efficiency.
· Choose the best location of shared resources for optimum use of office space.
· Choose the best positioning of users' systems to satisfy users' needs.
· Avoid wasting time and resources with unsuitable configurations.

This chapter presents an overview of the available networking alternatives and provides guidelines for making decisions. However, it's not intended to offer specific solutions for your particular network configuration and equipment requirements. For specific recommendations, contact your NeXT distributor and the manufacturers of the equipment you're considering or already own.

Determining Equipment Needs

The first step in planning your network is to determine what equipment you will need. For example, you might consider:

· How will you connect one system to another to transmit data?

· How many computers do you need, and how close together must they be?

· How far apart are the most distant computers on the network?

· Will you need to purchase additional equipment (for example, concentrators, repeaters, gateways, or routers) to facilitate data transmission on your network?

· Will your network be located in a single building, or must there be a means of transmission between buildings or over longer distances?

· What are your network's peripheral requirements?

For information about the servers you need for your network, see ªDetermining Which Servers Are Needed,º later in this chapter.

Cabling

Most network installations connect computers with either thin Ethernet cable or with twisted-pair cable.

If you are using PC type computers based on Intel 486 type CPUs, your choice of expansion card (Ethernet or Token Ring adapter) will dictate which cable to use.

NeXT computers are designed to communicate over an Ethernet network. Every NeXT computer comes with built-in connectors for both thin Ethernet and twisted-pair Ethernet cables. You can attach your computer to either type of cable. This section explains the advantages and disadvantages of each.

Thin Ethernet Cable

Thin Ethernet coaxial cables consist of a single wire surrounded by an insulator and a shield. With a network based on thin Ethernet cables, your equipment needs are minimal. All you have to do is string the cables, attach the appropriate terminators, and plug in your computer. If cable installation for your system can be done without difficulty, then this solution may be best.

The two main disadvantages of thin Ethernet are that you must install the cables, which requires both expense and effort, and that a single cable problem may jeopardize a portion or even all of your network communication. Often, cables must be installed through walls. However, each site has its unique requirements.

Observe the following guidelines for thin Ethernet:

· You can attach a maximum of 30 computers to each thin cable segment.

· The maximum cable segment length is 185 meters. After 185 meters, you can use a repeater to join additional cable (a maximum of four repeaters can be used for this purpose).

· Computers are connected to cable segments using a BNC ªTº adapter.

· An Ethernet terminator must be attached to each end of the cable.

Twisted-Pair Cable

Twisted-pair Ethernet cables run from each computer to a central network hub. This cable consists of two pairs of wiresÐone pair for transmitting data and one for receiving data. (The wires in each pair are twisted togetherÐhence the name *twisted pair*.)

To operate this network, you must purchase and maintain the network hub equipment,also called a ªconcentrator,º which can be costly. However, you can usually use existing telephone wiring, which may reduce overall expense if you don't have to install many cables. If you have several systems spread out in a building, or if you have a pre-existing twisted-pair network, this solution may be best for you.

Observe the following guidelines for twisted-pair Ethernet:

· Only one computer can be attached to a twisted-pair cable segment.

· Different vendors allow various cable lengths. You may be able to extend cable limits depending upon the vendor's implementation.

Networking Equipment

Because networking needs vary tremendously between sites, a wide variety of networking equipment is available. This section describes some of the types of equipment you might use on your network; it also discusses some of the possible solutions you might choose in different situations. Most of this equipment can be obtained from third-party vendors, who can assist you in determining the equipment needs for your network.

The following equipment is commonly used for extending or joining networks (these are the basic types; available equipment varies widely and may combine several functions into one machine):

· *Repeaters* are used to join lengths of network cables, or to split a network cable into multiple segments. You might also find repeaters useful if you want to use different types of cable in your network. For example, you could connect an Ethernet network on a thin cable to one on a thick-coaxial cable with a repeater.

· *Concentrators* permit you to position computers closer together on the network cable than you could otherwise. If you use a twisted-pair cable, you need a concentrator.

· *Bridges* filter traffic within a single network. They work like a traffic cop to direct messages toward a destination and to exclude messages that are intended for other destinations. Like repeaters, they can join network segments. Unlike repeaters, they can extend the network by

resending the signal. As traffic on your network increases, you may find you need a bridge.

· *Routers* direct messages between separate networks. They make decisions about which path through the network messages will take.

With these equipment options, you can set up your local work areas with some flexibility in the types of cable you use. For local networking, you could use repeaters to extend your network, or a bridge to combine two thin Ethernet networks. If the Ethernet network uses different types of cable, you could install a repeater, bridge, or router. You could then run thin cable into one end of your equipment and use twisted-pair cable from there on. You can also join thin or twisted-pair cable to an existing thick-coaxial Ethernet cable.

To operate more complex networks with higher traffic, you might use routers. These can be used to create *subnets*, which are logical divisions of a network into smaller subnetworks. This equipment can give you better administrative control and network performance as your network grows. See Chapter 10 and Appendix C for more information.

A range of solutions is available if you need to extend your network beyond a single building. One important factor is the distance over which you need to extend the network. If you have buildings located close together, you can install fiber optic or broadband cable between them. For example, fiber optic transceivers installed between buildings will allow you to extend the range of your network to approximately 1 1/2 miles at Ethernet speeds (and farther if you add more transceivers). Since you can't easily string wires through city streets, fiber optic transceivers are most useful in a ªcampusº type of building arrangement, where you can install them away from public areas.

If you have tall buildings that are in direct line of sight with each other, you can use a microwave transceiver dish to transmit data. This extends data transmission perhaps 10 to 15 miles. However, if any objects (even a large flock of birds or heavy rain) intrude between the transmitting transceivers, the signal can be interrupted.

Phone lines are a ready solution to data transmission beyond a single building. They go anywhere, and dedicated lines are available for lease. Many networking software applications are available, such as UNIX-to-UNIX Copy (UUCP) and **tip**, that can be used to transmit data over phone lines. You can transmit data on normal phone lines at speeds from 300 bits per second (bps) to 19200 bps and higher. See Chapter 7 and Chapter 12 for details.

If you have the budget and the need, satellites can be used to transmit your data worldwide.

You should also consider linking to existing networks to make use of their resources. A modem and a phone line will put you in touch with the international UNIX-based UUCP network. NEXTSTEP computers also support the TCP/IP (Transmission Control Protocol/Internet Protocol) network that

links sites worldwide. The most inexpensive way to access the Internet is to connect to an existing site. In addition, some vendors offer Internet mail gateway services.

Peripheral Devices

Peripheral devices offer a range of services that expand the capabilities of your network. These peripherals include external hard disks, printers, modems, and graphics tablets, among others.

In addition to the information in this manual, you'll find instructions for attaching and configuring your peripheral devices in the documentation that comes with each device. Consult the manufacturer for guidance in determining network configuration requirements.

Additional Hard Disks

Depending on your data storage requirements, you may want to add an additional SCSI hard disk to your computer.

Refer to the manual for your computer for details on its hard disk drives. For information about adding SCSI hard disks, see Chapter 7, ªAttaching Peripherals.º If you have an Intel-based PC with an IDE hard disk drive, refer to the *Installing and Configuring NEXTSTEP Release 3.3* manual.

Printers

In addition to the NeXT 400 dpi Laser Printer and NeXT Color Printer, numerous printers are compatible with NEXTSTEP computers. Because NE XTSTEPcomputers can be used with client software for Novell NetWare®, you can make use of printers attached to NetWare networks. Note that NeXT printers are designed to work only with NeXT computers.

To determine how many printers you need, decide if you want one printer per computer, or if you want to share a printer among several users. In considering these questions, keep in mind that printer needs vary widely among users. For example, a technical publications department uses printers heavily, while some other departments might use printers much less frequently. You might decide to give each writer an individual printer, while setting up a shared printer for low-use departments.

For more information about connecting non-NeXT printers, see Chapter 7.

Modems

For more information about modems, see Chapter 7, ªAttaching Peripherals,º Chapter 12, ªUsing UUCP,º and Appendix B, ªCable and Modem Configuration.º

You can also attach a fax modem to give your system the ability to send and receive fax messages. For information on fax modems, see the *User's Guide*.

Graphics Tablets

Graphics tablets let you turn your NEXTSTEP computer into a freehand drawing pad. With a stylus, you have precise control over cursor movement. If you are using a NeXT computer, the graphics tablet must be compatible with SummaSketch®I (MM I format) and must use a 12 × 12 inch size format. More information can be found in Chapter 7.

Determining Which Servers Are Needed

Servers are processes that are designed to let you share network resources among client processes by managing a centralized resource for a particular area of responsibilityÐNetInfo serving, file serving, printer serving, mail serving, NetBoot serving, or fax serving. Using centralized resources simplifies administrative tasks, allowing you to administer a single central database rather than a set of distributed ones or scattered individual resources.

There's usually no fixed ratio of server computers to users. When determining your server requirements, you should ask the following questions:

·   What is the usage pattern for the resource? Unusual traffic or heavy local use may require increased numbers of resources. For example, an archive server process that users access only once or twice a day may serve a larger user base than a print server process that is accessed constantly.

·   What are the needs and locations of the groups using the resource? It's frequently convenient to assign resources based on company hierarchies (for example, one resource per department).

·   For file-sharing, you may need to choose between having a single large computer with a lot of

disk space or several smaller computers. Computers with larger disks may require increased boot time, but they are typically more cost-effective and easier to administer.

· Do you want to combine types of resources on a computer? (See ªCombining Resources,º later in this section.)

· Do you want the computer to be dedicated to running a resource server process, or can it also be used as someone's workstation? If a computer will be used for several purposes, it may require increased memory and disk space.

NetInfo Services

A computer running a *NetInfo server* process provides storage for and access to a NetInfo database, which corresponds to a particular *domain*. The NetInfo server process itself manages access to the NetInfo database and keeps track of administrative network information such as user accounts, group membership, host names and addresses, fax modem information, and so on.

The term *domain* refers to one or more databases that have the same information. A domain can consist of a single database, which is read/write, letting processes update information as well as access information. A domain can consist of two or more databases with the same information, in which case one database is *read/write* and all others are *read only*. The read/write database is the master; all others are clones. Thus a domain with two or more databases includes one master and one or more clones. (The master can update the clone databases, so in that respect the clones get written to, but no other process can alter information in a clone, so with respect to network activity, the clones are *read only*).

Each database requires a NetInfo server process to manage access. Requests from client processes go to the NetInfo server process for a particular domain. Because clones are exact copies of the master, client requests that happen to access clone NetInfo servers get the same results as if they access the master NetInfo server.

To provide redundancy and reliability of your network, you may wish to set up additional computers to run server processes for the same NetInfo database (called *clone servers*).

This section is only a brief introduction to NetInfo concepts. For more information about setting up NetInfo servers and configuring domains, read the following chapters:

· Chapter 2, ªSetting Up a NetInfo Networkº
· Chapter 3, ªNetInfo Networkingº

File Services

A computer that provides file services supplies disk storage space for other computers. The Network File System (NFS) is used to share files across the network. A computer running a client process sees the remotely shared directories just like the directories on its own disk. Any computer with a hard disk can be used as a file server, but the more disk storage and memory it has, the better its performance.

There are different types of file service, and each type can require somewhat different disk and memory configurations. For example, a computer that runs a *home directory server* process contains the home directories for the users who have logged into other computers. A computer running an *applications server* process provides a central location for applications for users across the network.

Due to access frequency and the large amount of data storage needed, computers that provide home directory services require either more memory and disk space or fewer users assigned to a single server. Although the requirements may vary, 40 MB of home directory space per person is almost always enough, and as little as 25 MB may be adequate.

Other factors that can increase the disk space and memory needed are the types of applications used. If users process many documents or use sound frequently, they need more memory and disk space. Similarly, users making heavy use of color or video image processing need additional space.

In general, you'll want to set up network-wide user accounts rather than local accounts (enabling users to log into any computer on the network, rather than restricting them to a single computer, and ensuring consisten user identification throughout the network). For details, see Chapter 5, ªManaging User Accounts and User Groups.º

For more information about setting up file servers, see Chapter 4, ªSetting Up the Network File System.º

Print Services

Print services allow users to share a printer. For best performance, the computer used for print

service should be dedicated to this purpose. This is because printing requires many CPU cycles and a great deal of memory, both of which can severely impact normal processing.

A computer running a print server process can be available to all users on the network or available to a subset of users.

For more information about exporting a printer to the network, see the *User's Guide*, Chapter 18: Managing Printers and Faxes.

Mail Services

Computers running mail server processes can provide electronic mail storage and processing for a group of users. Often, only one mail server is needed for an entire company. You can locate the mail server on the same computer that hosts the network NetInfo server.

Although the computer hosting the mail services primarily serves internal mail needs, you can also use it as your network's link to the outside world with a modem link for UUCP hookup, or a leased telephone line, or other outside connections.

When configuring a computer to run a mail server, use the maximum amount of memory you can afford. Because mail services will probably be storing all mail messages for the entire network, the computer will also need a large disk.

For more information on mail servers, see Chapter 6, ªManaging Electronic Mail.º

Fax Modem Services

A computer providing fax modem services enables its clients to share one or more fax modems. The computer hosting the fax modem server process can also host a print server as both servers require similar configurations.

For more information on fax modem servers, see the *User's Guide*.

Combining Resources

Sometimes you can conserve resources by combining more than one resource server on a single computer. A computer hosting combined services may require extra memory and disk space. You need to weigh the advantages of using a single large server versus the value of spreading service across several computers to improve robustness and performance, which may be necessary on a large network.

Warning: Combining a modem server with another type of server may pose a security risk, as the modem may provide unauthorized access opportunities to the outside world.

The following table summarizes how different server types may be combined. This table assumes that the servers listed do not provide other types of services. NR stands for "not recommended."

Combining Servers

	NetInfo Clone	Home Directory	Other Mail	File	Print	Modem
NetInfo Master	NO	YES	YES	YES	*	YES
NetInfo Clone	---	YES	YES	YES	*	YES
Home Directory		---	YES	[2]	NR	YES
Mail			---	YES	NR	YES
Other File				---	NR	YES
Print					---	YES

* NetInfo responses may be delayed during printing.
[2] An additional hard disk is recommended when combining these types of file servers.

Network Connectivity

NEXTSTEP computers offer a high degree of connectivity to multiple platforms:

· UNIX—Because the NeXT Mach operating system is UNIX-compatible and quite similar to 4.3BSD , all NEXTSTEP computers have access to UNIX networking.

- EthernetÐEthernet has established itself as the industry standard for networking UNIX-based computers due to its reliability and capacity to transfer large amounts of information rapidly. NEXTSTEP supports a variety of drivers for high quality Ethernet adapters for Intel 486-based PCs. NeXT computers permit immediate connection to Ethernet networks via their built-in Ethernet interface.

- Transmission Control Protocol/Internet Protocol (TCP/IP)ÐThis international network protocol is supported by almost all computer vendors. TCP/IP support is included with NEXTSTEP systems.

- IBM®mainframeÐYou can purchase software applications that let you share data with an IBM mainframe environment using IBM 3270 terminal emulation. Through this emulation, you have access to a wide variety of IBM applications.

- DOSÐOutside vendors can supply software to let you exchange data between an IBM PC-compatible computer and a NEXTSTEP computer over an Ethernet network. NEXTSTEP computers also come with a built-in facility that lets you copy files to and from DOS-compatible floppy disks.

- Macintosh®ÐNEXTSTEP computers come with a built-in facility that lets you copy files to and from Macintosh-compatible 1.4MB floppy disks.

- Novell NetWareÐNEXTSTEP computers come with Novell client software, which allows access to files and PostScript®printers on Novell networks running NetWare 286 or 386.

- X-WindowsÐYou may wish to use third party software to allow your NEXTSTEP computers to run X-Windows applications.

Considering Security

When you plan for the design and installation of your network, you also need to consider security. If security is at all important at your site, you'll want to consider security issues during the planning process. Chapter 14, ªSecurity,º gives detailed instructions on practical things you can do to increase the security of your data.

As you plan your network and position your networking hardware, consider the physical security of the cabling and the equipment. It's much easier (and cheaper) to provide security measures *before* the equipment is installed. A couple of questions to consider regarding physical security are:

- Should the network cabling be exposed or run through the walls? (Exposed wire is easier to tap.)

- Who should have access to the computers providing network-wide services (or any other computer) and the networking hardware?

Good security takes into account how much work an unauthorized user is willing to do to steal or damage your data. In an office environment, it may be sufficient to protect a document by setting access permissions with the Workspace Manager™. If you feel you need a greater degree of protection, you can encrypt your documents.

Encryption scrambles the data so that it's indecipherable even if an unauthorized user manages to access it. To bypass the security of encryption, an intruder must learn the code word you've used to encrypt the file. Of course, the documents must be decrypted before they can be used again. File encryption is available with the UNIX command **crypt**.

Good security also takes into account the worst case scenario. You'll need to plan how you would go about restoring your computer to a usable state if the security of your system were breached. Sometimes a solid backup strategy is the best security of all. Consider the following points when planning your backup procedures:

- A current backup of all critical files should be available at all times.
- Backups should be stored in a secure location.
- Make sure that you have a plan for reinstalling the system software on your computer.

Remember that good backups are like an insurance policy: you hope you never have to use them. For more information, see Chapter 8, ªManaging System Backups.º

For More Information

This manual contains references to other sources of related information. There are two kinds of references made in the chapters:

- Printed documentationÐYou may be referred to another NeXT document (the *Owner's Guide*, for example).

- UNIX manual pagesÐUNIX commands to be typed into a shell window are documented in manual pages. These can be accessed through the Digital Librarian™if you have installed the Documentation package.

If you can't find the information you need, or if you just want to know more about system administration, you may want to investigate the publications listed in Appendix H, ªSuggested Reading.º

NEXTSTEP In Focus System Administration Journal

NEXTSTEP In Focus is a quarterly journal produced by NeXT Computer, Inc., that presents updates and other timely technical information to network and system administrators and users. To subscribe to *NEXTSTEP In Focus*, send your request to

NEXTSTEP In Focus Subscriptions
NeXT Computer, Inc.,
900 Chesapeake Drive
Redwood City, CA 94063

From within the U.S., call 1-800-848-NeXT.
From outside the U.S., call +1-415-780-2922.

NeXTanswers

Answers to many technical questions about NEXTSTEP can be faxed or e-mailed to you for free through our document retrieval system, NeXTanswers. You can get information on NEXTSTEP for Intel Processors configuration and compatibility, installation instructions, lists of known bugs and workarounds, articles from NEXTSTEP In Focus, and information on a variety of other topics, as well as device drivers and other software, sent to you automatically.

NeXTanswers is available 24 hours a day by phone (FAX), by Internet e-mail , by anonymous ftp, or downloaded from the BBS.

NeXTanswers by E-mail

To use NeXTanswers by Internet e-mail, send requests to **nextanswers@next.com**.

These requests are answered electronically and are not read or handled by a human being. Files are sent as NeXTmail attachments by default; you can request they be sent as ASCII text files

instead.

To request a file, include that file's ID number in the Subject line or the body of the message. You can request several files in a single message. You can also include commands in the Subject line or the body of the message.

These commands affect the way that files you request are sent:

```
ASCII  causes the requested files to be sent as ASCII text
SPLIT  splits large files into 95KB chunks, using the MIME
       Message/Partial specification
REPLY-TO address sets the e-mail address NeXTanswers uses
```

These commands return information about the NeXTanswers system:

```
HELP               returns this help file
INDEX              returns the list of all available files
INDEX BY DATE      returns the list of files, sorted newest to oldest
SEARCH keywords    lists all files that contain all the keywords you list (ignoring
capitalization)
```

For example, a message with the following Subject line requests three files:

```
Subject:  2101 2234 1109
```

A message with this body requests the same three files be sent as ASCII text files:

```
2101 2234 1109 ascii
```

This message requests two lists of files, one for each search:

```
Subject: SEARCH Dell SCSI          SEARCH NetInfo domain
```

NeXTanswers will reply to the address in your **From:** line. To use a different address, either set your **Reply-To:** line or use the NeXTanswers command

```
REPLY-TO <your-address>
```

If you have any problem with the system or suggestions for improvement, please send mail to nextanswers-request@next.com.

NeXTanswers by FAX

To use NeXTanswers by fax, call (415) 780-3990 from a touch-tone phone and follow the instructions. You'll be asked for your fax number, a number to identify your fax (like your phone extension or office number), and the ID numbers of the files you want. You can also request a list

of available files.   When you finish entering the file numbers, end the call and the files will be faxed to you.

If you have problems using this fax system, please call Technical Support at 1-800-955-NeXT. You cannot use the fax system outside the U.S & Canada.

NeXTanswers on the World Wide Web

To use NeXTanswers on the World Wide Web,, connect to http://www.next.com/.

NeXTanswers by FTP

To use NeXTanswers by Internet anonymous FTP, connect to FTP.NEXT.COM and read the help file pub/NeXTanswers/README.   If you have problems using this, please send mail to nextanswers-request@next.com.

NeXTanswers BBS

To use NeXTanswers via modem call the NeXTanswers BBS at (415) 780-2965. Log in as the user "guest", and enter the Files section.   From there you can download NeXTanswers documents.

Technical Support

If you need technical support for NEXTSTEP beyond the information available from NeXTanswers, call the Support Hotline at 1-800-955-NeXT (outside the U.S. call +1-415-780-2922) to speak to a NEXTSTEP Technical Support Technician.

If your site has a NeXT support contract, your site's support contact must make this call to the hotline.   Otherwise, hotline support is on a pay-per-call basis.