PATHWORKS™ for Macintosh®
Version 1.1

Network Services User's Guide

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Version 1.1

Network Services User's Guide

Apple Computer, Inc.

20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010

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Contents

Using DECnet for Macintosh

Overview of the User's Guides

This part of the *Network Services User's Guide* describes all four of the user's guides (binders) that come with PATHWORKS™ for Macintosh® version 1.1. It presents a road map that shows the relationships among the four guides. This part also describes terminology and conventions used in this guide.

How to use the binders

PATHWORKS for Macintosh comes with a set of four user's guides in binders:

- The *PATHWORKS for Macintosh: Network Services User's Guide*—this binder—gives an overview of the product, tells you how to install the software on your Macintosh computer (*Installation*), and explains how to use PATHWORKS for Macintosh to access network services running on VAX™ computers (*Using Network Services*). The *Using DECnet for Macintosh* part of this binder tells you how to use DECnet for Macintosh, software that allows your Macintosh computer to participate in a DECnet network.
- The *PATHWORKS for Macintosh: MacTerminal User's Guide* tells you how to use the MacTerminal® application program supplied with PATHWORKS for Macintosh. The MacTerminal program allows your Macintosh computer to emulate a terminal so that you can access VMS™ terminal services. The *MacTerminal User's Guide* contains a reference describing the communications tools that come with MacTerminal.

- The *PATHWORKS for Macintosh: MacX User's Guide* tells you how to use the MacX™ program supplied with PATHWORKS for Macintosh. MacX lets you access DECwindows™ applications from your Macintosh computer. The *MacX User's Guide* contains a reference describing the communications tools that come with MacX.
- The *PATHWORKS for Macintosh: Mail for Macintosh User's Guide* tells you how to use the Mail for Macintosh® application supplied with PATHWORKS for Macintosh. Mail for Macintosh allows you to log in to a VAXmail server and exchange mail with other users on your network.

You can use the PATHWORKS for Macintosh user's guides in several different ways. You may want a complete introduction to the product, especially if you are unfamiliar with using Macintosh applications, networks, or the VMS operating system. Or you may want to get started immediately with a network service. If you are using PATHWORKS for Macintosh over a modem or serial connection, only certain parts of the user's guides will be relevant.

This section suggests different ways to use the guides, based on the approach that you want to take. The road map, later in this part, should also help you determine the best way to use these guides.

Network connection

If you are using PATHWORKS for Macintosh over a network, use the guides in this way:

- **Complete introduction**

  If you want a complete introduction to PATHWORKS for Macintosh, read the guides in the following order. For help with network terms and concepts, refer to Appendix A and the glossary in this binder.

  1. For information on how to install the software, read the Installation part of this binder.
  2. Read the Preface in the Using Network Services part of this binder for an overview of the information presented in that section.
  3. Read Chapter 1 in the *Using Network Services* part of this binder for an overview of the network services you can access from your Macintosh.

4. For each network service that you want to use, read the chapter describing that service in Using Network Services.
5. For complete information on using terminal services, read the MacTerminal User's Guide.
6. For complete information on MacX and DECwindows applications, read the MacX User's Guide.
7. If you want to use DECnet for Macintosh, refer to the Using DECnet for Macintosh part of this binder.
8. For complete information on using Mail for Macintosh, refer to the Mail for Macintosh User's Guide.

- **Quick start**

If you want to immediately start using a particular network service, follow the previous steps in "Complete Introduction" with the exception of Step 2. Refer to Appendix A or the glossary in this binder if you need help with a term.

Modem or serial connection

If you are using PATHWORKS for Macintosh over a modem or serial connection, you will not be able to access all of the services offered by the product because it is designed for use over a network connection. However, you *will* be able to use PATHWORKS for Macintosh to access terminal services running on a VAX computer. Use the guides in this way:

1. For information on how to install the software, read the *Installation* part of this binder.
2. If you want to use terminal services, read Chapter 4 in this binder.
3. If you want complete information on using terminal services, read the *MacTerminal User's Guide.*
4. If you want to set up an asynchronous DECnet connection for file transfer and terminal services, refer to the *Using DECnet for Macintosh* part of this binder.

Macintosh Operating System software

You can use PATHWORKS for Macintosh version 1.1 in a system software version 7.0 or 6.0.*x* environment (*x* refers to the number 4 or higher; PATHWORKS requires that you use version 6.0.4 or a later version). Note that there are differences in functionality depending on the system software installed on your Macintosh computer:

- **Installation**—to install PATHWORKS for Macintosh software, you use the script document called *PATHWORKS™-System 7.0* if your Macintosh is running version 7.0 and the script document called *PATHWORKS™-System 6.0.x* if your Macintosh is running version 6.0.*x*. The two scripts install different software; for instance, the Macintosh Communications Toolbox is installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0. To find out how to use the different scripts, refer to the *Installation* part of this guide.
- **Where software components are installed**—some PATHWORKS for Macintosh software components are stored in different locations in version 7.0 and version 6.0.*x*. For instance, the AppleTalk-LAT Tool is stored in the Extensions folder in version 7.0 and the Communications Folder in version 6.0.*x*. To find out where all the software components are installed, refer to the section "Where the Software is Located" in the *Installation* part of this guide.
- **The desktop**—the version 7.0 and version 6.0.*x* desktop look similar; however, with close inspection you'll notice some differences. In version 7.0, there is an additional menu called Label that allows you to assign text labels to icons. Version 7.0 also has a Help menu at the upper right corner of the desktop that you use to display information about items on the screen. Pictures of the version 7.0 desktop have been used throughout this guide.
- **Control Panel**—in version 7.0, you select a control panel icon in the Control Panels folder to display a panel. In version 6.0.*x*, there is one Control Panel window; you select an icon from the list in the left quarter of the Control Panel window to display a panel. The section "Selecting a Network Connection" in Chapters 2, 3, 4, and 5 in the *Using Network Services* part of this binder describes how to bring up control panels in the different system software environments.

- **Chooser**—the version 7.0 and version 6.0.*x* Chooser look similar; however, with close inspection you'll notice some differences. The version 6.0.*x* Chooser contains a User Name box, but the version 7.0 Chooser does not. Also, in the version 7.0 Chooser, a bold border indicates which area of the Chooser is active. Pictures of the version 7.0 Chooser have been used throughout this guide.
- **Setting access privileges**—in version 7.0, you use the Sharing command in the File menu to set access privileges. In version 6.0.*x*, you use the Access Privileges or Get Privileges command to set access privileges. Refer to the section "Access Privileges" in Chapter 2 of the *Using Network Services* part of this binder to learn how to set access privileges in the different system software environments.
- **Troubleshooting**—some of the network-related problems differ between version 7.0 and version 6.0.*x*. The section "Troubleshooting" in Chapters 2, 3, and 4 of the *Using Network Services* part of this binder describe the problems that may occur in the different system software environments.

Terminology used in this binder

The terms *log on* and *log off*, and *log in* and *log out* have different meanings:

- You *log on* to or *log off* of a file server or print server, as described in Chapter 2 or Chapter 3.
- You *log in* to or *log out* of the VMS operating system, as described in Chapter 4.

Conventions used in this binder

The `Courier` font is used to indicate computer commands and text that you type.

Terms that have a special meaning in relationship to Macintosh or Digital computers, or to networks, appear in **boldface** at first mention or when first defined in the text. These terms are defined in the glossary.

The *Network Services User's Guide* includes special text elements to highlight important or supplemental information:

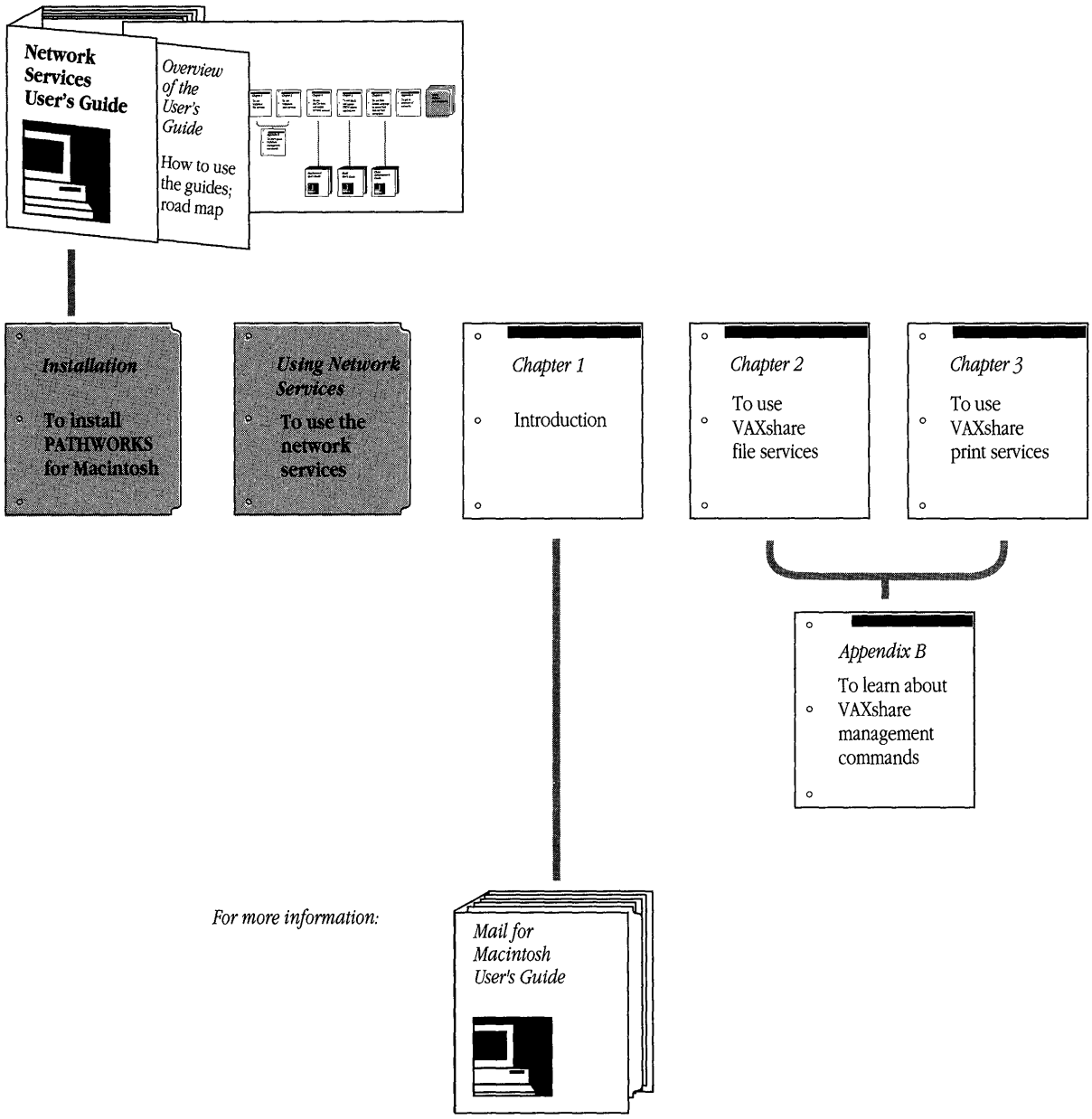
◆ **Note** Text set off in this manner presents additional information or interesting sidelights. ◆

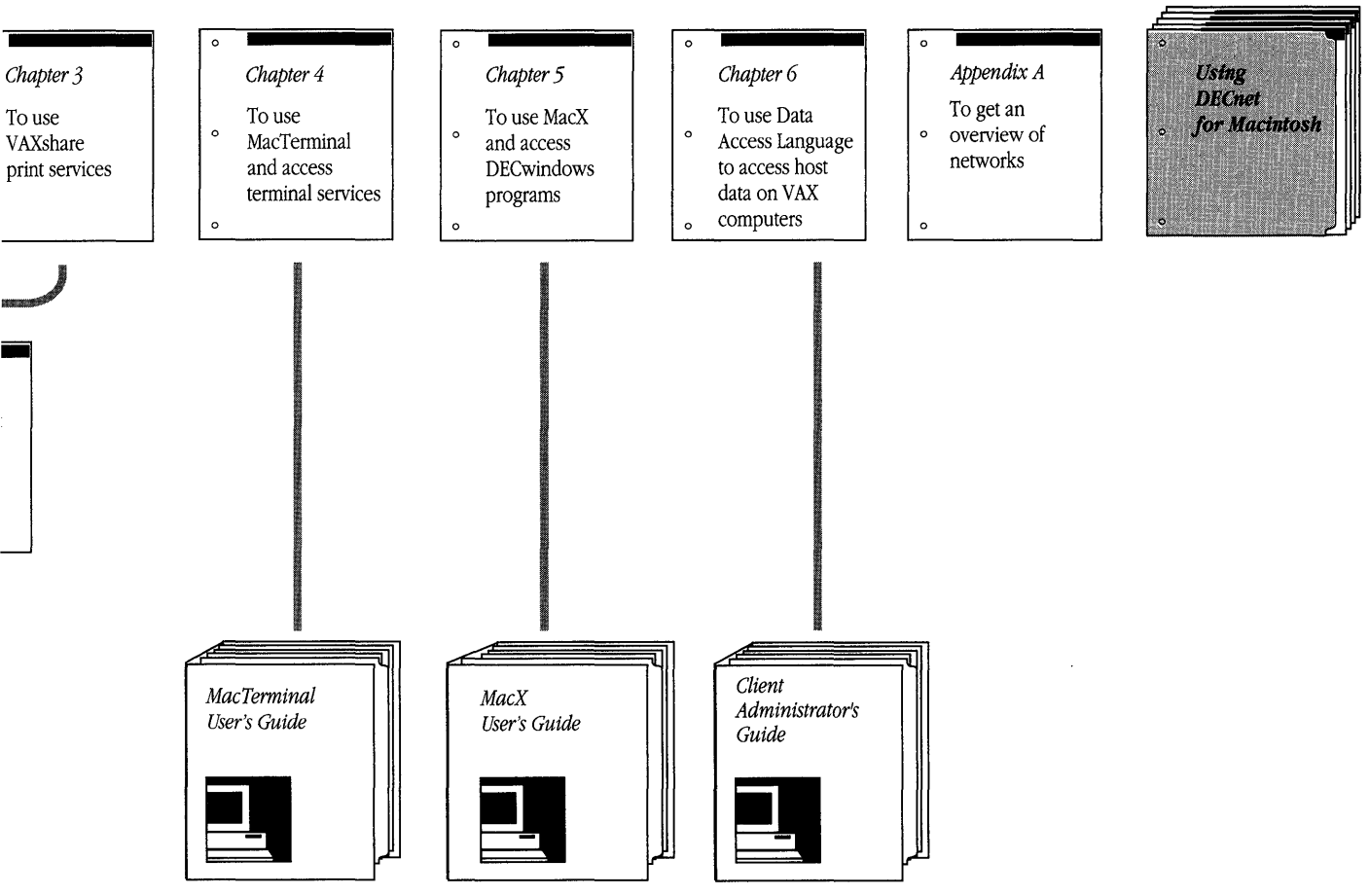
△ **Important** Text set off in this manner—with *Important*—presents important information or instructions. △

▲ **Warning** Text set off in this manner—with *Warning*—indicates potentially serious problems. ▲

Road map to the *Network Services User's Guide*

The following road map shows the major parts of the *Network Services User's Guide* and how the other user's guides relate to this one.


Network Services User's Guide
Overview of the User's Guide
How to use the guides; road map
Installation
To install PATHWORKS for Macintosh
Using Network Services
To use the network services
Chapter 1
Introduction
Chapter 2
To use VAXshare file services
Chapter 3
To use VAXshare print services
Appendix B
To learn about VAXshare management commands
For more information:
Mail for Macintosh User's Guide


Chapter 3
To use VAXshare print services
Chapter 4
To use MacTerminal and access terminal services
Chapter 5
To use MacX and access DECwindows programs
Chapter 6
To use Data Access Language to access host data on VAX computers
Appendix A
To get an overview of networks
Using DECnet for Macintosh
MacTerminal User's Guide
MacX User's Guide
Client Administrator's Guide

Installation

This part of the *Network Services User's Guide* gives detailed instructions for installing the PATHWORKS™ for Macintosh® software on your Macintosh computer.

Overview of installation procedures

PATHWORKS for Macintosh provides a number of services, and many pieces of software are involved in making the services available. Some of the software components reside on the VAX™ computers to which you connect and other components reside locally on your Macintosh computer. The components that reside on the VAX will be installed by your system administrator. You'll probably be responsible for installing the Macintosh components on your own computer.

PATHWORKS for Macintosh includes an Installer program that helps you install the necessary software on your Macintosh computer. The Installer works with two script documents. The script document called *PATHWORKS™-System 7.0* installs PATHWORKS software on a disk running system software version 7.0. The script document called *PATHWORKS™-System 6.0.x* installs the software on a disk running version 6.0.*x*. The script documents determine which software components are installed.

The Installer program lets you take either of two approaches:

- Install software components using the Easy Install option.
- Install only the components for one or more specific services using the Customize option.

The first approach is the easiest. "Installing Software Using the Easy Install Option," later in this part of the guide, presents a procedure for installing the basic PATHWORKS components (a list of the components that will be installed when you use this option is presented at the beginning of the section).

However, if you expect to use only one or two of the services—or if available memory and disk space is limited—you may choose to install only the components for those services that you intend to use. "Installing Software Using the Customize Option," later in this part of the guide, tells you how to install the software for specific services. This approach requires a little more up-front planning. To help you with this planning, the section "About the Software Components," later in this part of the guide, provides details about each of the components of PATHWORKS for Macintosh.

△ **Important** In addition to following the procedures described in this part of the guide to install the PATHWORKS software, the communications tools, MacTCP, and DECnet software for the Macintosh must be configured before you can use them. Your system administrator can configure these components for you. If you want to configure them on your own, refer to the *Communications Tools Reference* in the *PATHWORKS for Macintosh: MacTerminal User's Guide* to configure the communications tools; refer to the *PATHWORKS for Macintosh: MacTCP Administrator's Guide* (this guide can be obtained from your system administrator) to configure the MacTCP® software; and refer to the *Using DECnet for Macintosh* part of this binder to configure DECnet for Macintosh. △

Hardware, system software, and network connection requirements

This section describes the minimum hardware and software requirements for using PATHWORKS for Macintosh. It also describes the kinds of connections to Digital networks that enable you to use the network services provided by PATHWORKS for Macintosh.

Hardware requirements

You must have, at a minimum, the following workstation configuration:

- a Macintosh Portable, Macintosh Classic, Macintosh LC, Macintosh Plus, Macintosh SE-family, or Macintosh II-family computer
- 2 megabytes (MB) of memory are recommended; if you only have 1 MB of memory, you will have limited functionality
- one hard disk drive

System software requirements

Your Macintosh computer must have the following software installed before you can install and use PATHWORKS for Macintosh:

- System software version 7.0 or version 6.0.4 or later
- AppleShare® workstation software
- AppleTalk® Phase 2 software (for use with an Ethernet card)

If your Macintosh computer is connected to the Digital network—and thus to the VAXshare file server—through an Ethernet card, you must also have support for AppleTalk Phase 2. (Network connections are described in the next section.) If you are using the Apple® EtherTalk® NB Card, you must install EtherTalk 2.0 software. If you are using some other Ethernet card, you must install the equivalent AppleTalk Phase 2 software. See the documentation accompanying your Ethernet card for instructions.

◆ **Note** If you have both AppleTalk Phase 1 and Phase 2 installed, you must select EtherTalk Phase 2 from the Network control panel. See "Selecting a Network Connection" in Chapters 2, 3, 4, or 5 of the *Using Network Services* part of this binder. ◆

Network connection requirements

You can connect your Macintosh computer to a network of VAX computers in one of two ways:

- through a LocalTalk® network and a router
- through an Ethernet card

Figure I-1 illustrates the two types of network connections. A **router** is a device that connects two or more separate networks to form a larger network or, in Apple parlance, an **internet**. (For an explanation of routers and other network elements, see Appendix A.)

A Macintosh computer can also be connected directly to an Ethernet environment by means of an Ethernet card. Although the ability to connect to and communicate through

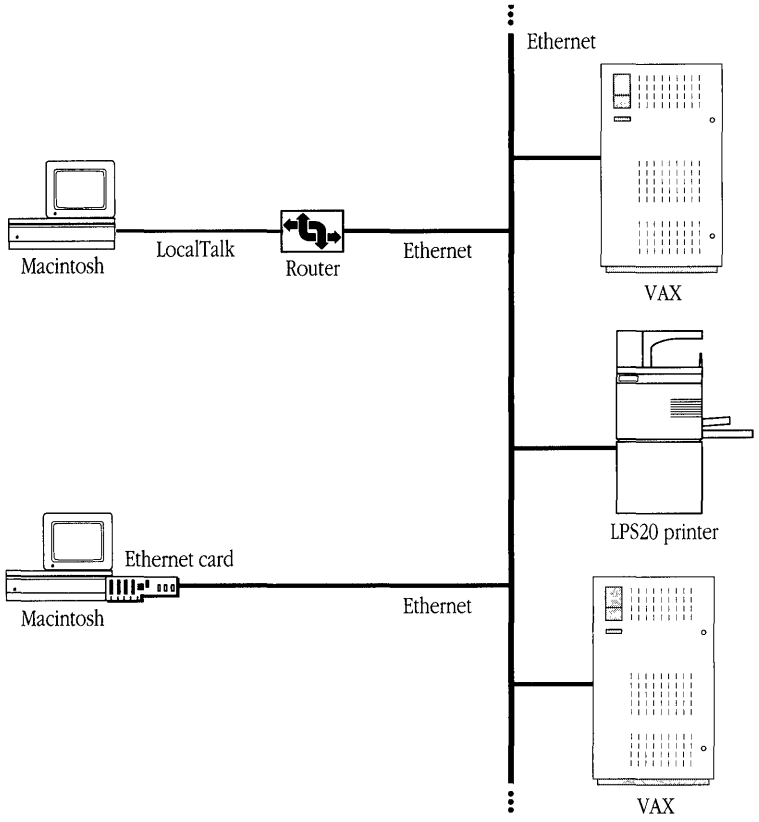


Figure I-1 Connecting your Macintosh to a Digital network

a LocalTalk network is built into every Macintosh computer, specialized hardware and software are needed to enable a Macintosh to connect to Ethernet environments. Apple manufactures an Ethernet card, called the Apple EtherTalk NB Card, that provides this capability. Other Ethernet cards are also available. See the *Software Product Description* (SPD 31-53.xx) for information on which AppleTalk Phase 2 Ethernet cards support PATHWORKS for Macintosh.

Although most of the services provided with PATHWORKS for Macintosh require a network connection, you can also use terminal services through a serial or modem connection to a single VAX computer. See Chapter 4, "Terminal Services," in the *Using Network Services* part of this binder.

Installing the software using the Easy Install option

This section tells you how to use the Easy Install option of the Installer program to install the following software components on your Macintosh computer:

- AppleTalk Data Stream Protocol (ADSP) driver (installed on version 6.0.*x* only since the ADSP driver is included with version 7.0)
- AppleShare VMS UAM
- Data Access Language driver (called *DAL* in version 7.0 and *DAL6* in version 6.0.*x*)
- DAL Preferences file
- hosts.cl1 file
- Local Area Transport (LAT) Control Panel and communications driver
- LAT Prep
- Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
- Macintosh Communications Toolbox communication tools
  - Terminal Emulation Tools: TTY Tool, VT102 Tool, VT320 Tool
  - File Transfer Tools: Text Tool, XMODEM Tool
  - Connection Tools: Apple Modem Tool, AppleTalk ADSP Tool, AppleTalk-DECnet Tool, AppleTalk-LAT Tool, LAT Tool, Serial Tool
- MacTerminal application program
- MacX application program, plus sample session documents and minimum fonts (only two MacX fonts are installed to save disk space and installation time; if you install MacX support using the Customize option, almost 400 fonts are installed)
- Mail for Macintosh application program

◆ **Note** If you have less than 2 MB of memory on your Macintosh computer you cannot use the Easy Install option. Install individual network services using the Customize option as described in the next section "Installing the Software Using the Customize Option." ◆

For a description of these software components and all the other Macintosh software that supports PATHWORKS for Macintosh network services, refer to the section, "About the Software Components" at the end of this chapter.

To install the software using the Easy Install option:

1 **Start your Macintosh computer.**

If you have virus protection software installed on your system, it is recommended that you turn it off for the duration of the installation process.

2 **Mount the VAXshare server volume called *PATHWORKS V1.1.***

The steps that follow show how to mount the PATHWORKS V1.1 volume. For more detailed instructions, see Chapter 2 of the *Using Network Services* part of this binder. Note that if you are connected to more than one network, you may need to select a network before continuing. For more information, see "Selecting a Network Connection" in Chapter 2. If more than one VAXshare file server is available on your network and you don't know which file server contains the PATHWORKS V1.1 volume, ask your system administrator.

a. Open the Chooser from the Apple (🍎) menu.

b. Select the AppleShare icon from the group of icons near the upper-left corner of the Chooser window.

c. If your network is divided into **zones,** select the zone that has the VAXshare file server that contains the PATHWORKS V1.1 volume.

d. Select the VAXshare file server that contains the PATHWORKS V1.1 volume.

   A dialog box appears that allows you to identify yourself and to choose whether to log on as a registered user or—if the system administrator has enabled this option—as a guest.

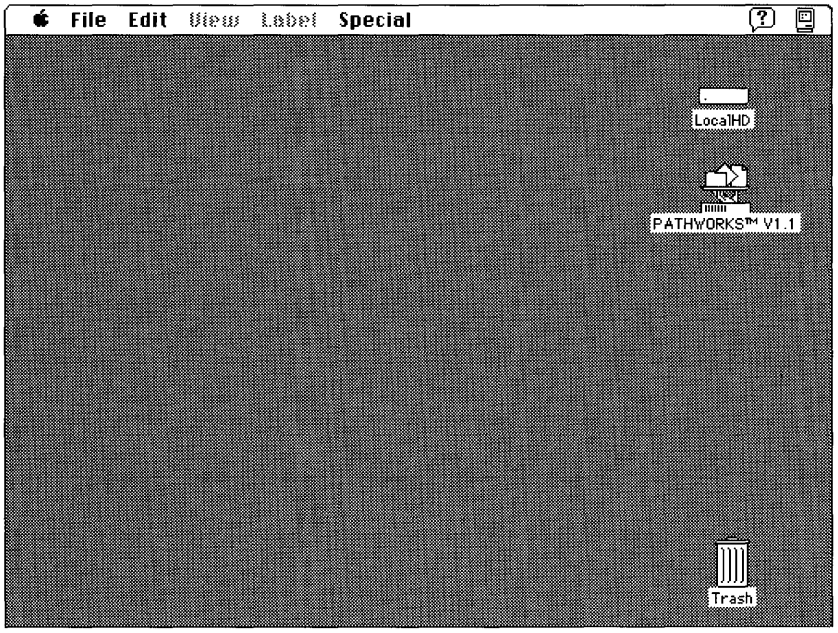
e. If you have a VMS™ account on the VAX computer that is running the file server, select Registered User and enter your user name and password. Otherwise, select Guest. Click the OK button. (If you want to select Guest and the Guest option is unavailable, see your system administrator.)

A dialog box appears, listing the server volumes available on the file server that you selected.

f. Select the PATHWORKS V1.1 volume and click the OK button.

g. Close the Chooser window.

The PATHWORKS V1.1 volume should soon appear on your Macintosh desktop.

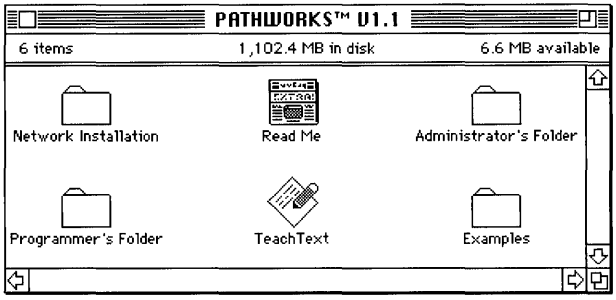


3 Open the PATHWORKS V1.1 volume.

The volume contains the following components:

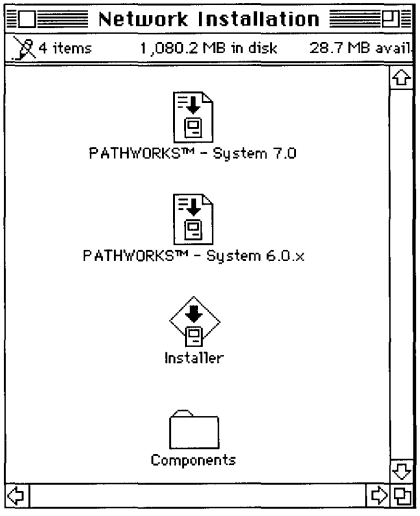
- Network Installation folder.
- Read Me document.
- TeachText application program. This program lets you open the Read Me document.
- Administrator's Folder. This folder contains support files and utilities for system administrators. You do not need to do anything with this folder if you are not a system administrator.

- Programmer's Folder. This folder contains support files and utilities for programmers. You do not need to do anything with this folder if you are not a programmer.
- Examples folder. This folder contains a number of examples including mBin, a MacBinary converter (for more information, see the section "Working with Documents on a VAXshare File Server" in Chapter 2 of the *Using Network Services* part of this binder). This folder also contains Backup-Mac.Com, an automatic backup utility that works on Macintosh computers using DECnet™ software.



4 Open the Network Installation folder.

The Network Installation folder contains the Installer program, the PATHWORKS™-System 7.0 script, the PATHWORKS™-System 6.0.*x* script, and the Components folder. The Components folder contains the software used by the Installation scripts.

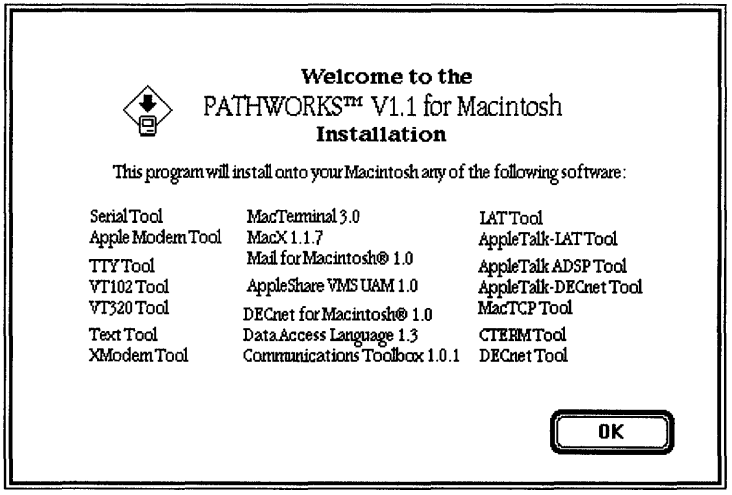


5 Start the Installer program.

a. To start the program in a version 7.0 environment, drag the PATHWORKS™-System 7.0 icon to the Installer program icon (so that the tip of the pointer is on the program icon).

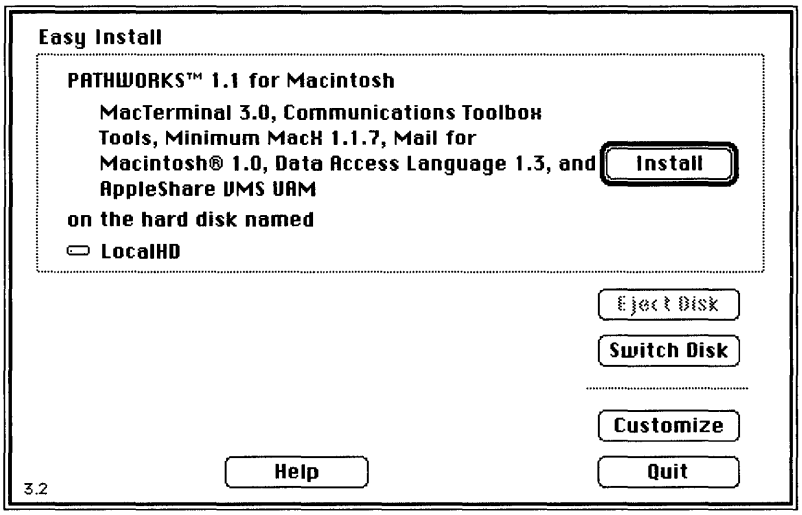
b. To start the program in a version 6.0.*x* environment, hold the Shift key down as you click the PATHWORKS™-System 6.0.*x* script icon and the Installer program icon. Then double-click either of these two icons.

The program displays an Installer dialog box that contains general information about installing PATHWORKS for Macintosh software components.



6 Click the OK button.

The Installer program displays the Easy Install dialog box.



7 **Make sure that the disk indicated in the Easy Install dialog box is the one on which you want to install the PATHWORKS for Macintosh software.**

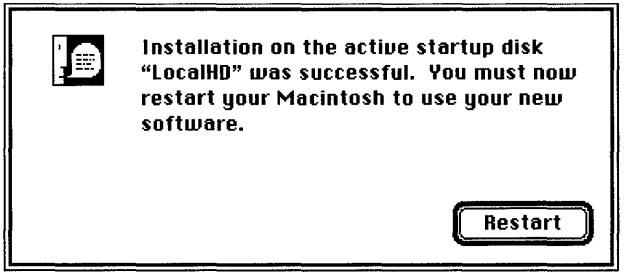
If the disk named in the dialog box is not the one on which you want to install the software, click the Switch Disk button until the correct disk name appears.

8 **Click the Install button.**

The Installer displays an Installer status dialog box that keeps you informed on the progress of the installation.

9 **When you have successfully completed the installation, a dialog box appears that tells you to restart your Macintosh computer.**

Click the Restart button.



Installing the software using the Customize option

This section describes how to use the Customize option of the Installer program. You may want to customize your installation when you already know that you will only be using a subset of the files and programs included with the PATHWORKS for Macintosh software.

Using the Customize option, you can install one or more of the following network services on your Macintosh computer:

- MacTerminal support
  - ADSP Driver (installed on version 6.0.*x* only since the ADSP driver is included with version 7.0)
  - Connection Tools: Apple Modem Tool, AppleTalk ADSP Tool, AppleTalk-DECnet Tool, AppleTalk-LAT Tool, Serial Tool
  - File Transfer Tools: Text Tool, XMODEM Tool
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
  - MacTerminal application program
  - Sample Documents
  - Terminal Emulation Tools: TTY Tool, VT102 Tool, VT320 Tool
  - Terminal Fonts
- MacX support
  - ADSP Driver (installed on version 6.0.*x* only since the ADSP driver is included with version 7.0)
  - AppleTalk-DECnet Tool
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
  - MacX application program
  - MacX fonts
  - Sample Documents

- Mail for Macintosh
  - ADSP Driver (installed on version 6.0.*x* only since the ADSP driver is included with version 7.0)
  - AppleTalk-DECnet Tool
  - Help file
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
  - Mail for Macintosh application program
  - PATHWORKS Listener
- AppleShare VMS UAM
- Data Access Language support
  - ADSP Driver (installed on version 6.0.*x* only since the ADSP driver is included with version 7.0)
  - AppleTalk ADSP Tool
  - Data Access Language driver (called *DAL* in version 7.0 and *DAL6* in version 6.0.*x*)
  - DAL Preferences file
  - hosts.cl1 file
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
- LAT support
  - LAT Control Panel and communications driver
  - LAT Prep
  - LAT Tool
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
- MacTCP support
  - Hosts file
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
  - MacTCP Control Panel and communications driver
  - MacTCP Tool

- DECnet for Macintosh support
  - CTERM Tool
  - DECnet Control Panel
  - DECnet Driver
  - DECnet Tool
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
  - NCP application program
  - NetCopy application program
- Minimum MacX
  - ADSP Driver (installed on version 6.0.*x* only since the ADSP driver is included with version 7.0)
  - AppleTalk-DECnet Tool
  - Macintosh Communications Toolbox (installed on version 6.0.*x* only since the Communications Toolbox is included with version 7.0)
  - MacX application program
  - Minimum MacX fonts (two out of almost 400 fonts are installed)
  - Sample Documents
- Minimum Data Access Language
  - An option that allows you to use Data Access Language on a Macintosh computer with 1 MB of memory running under the Finder™

For a description of these software components and all the other Macintosh software that supports PATHWORKS for Macintosh network services, refer to the section "About the Software Components" at the end of this chapter.

To install the software using the Customize option:

1 **Start your Macintosh computer.**

If you have virus protection software installed on your system, it is recommended that you turn it off for the duration of the installation process.

2 **Mount the VAXshare server volume called *PATHWORKS V1.1*.**

The following steps summarize how to mount the PATHWORKS V1.1 volume. (For more detailed instructions, see Chapter 2 of the *Using Network Services* part of this binder.) Note that if you are connected to more than one network, you may need to select a network before continuing. For more information, see "Selecting a Network Connection" in Chapter 2. If more than one VAXshare file server is available on your network, and you don't know which file server contains the PATHWORKS V1.1 volume, ask your system administrator.

a. Open the Chooser from the Apple (🍎) menu.

b. Select the AppleShare icon from the group of icons near the upper-left corner of the Chooser window.

c. If your network is divided into **zones,** select the zone that has the VAXshare file server that contains the PATHWORKS V1.1 volume.

d. Select the VAXshare file server that contains the PATHWORKS V1.1 volume.

   A dialog box appears that allows you to identify yourself and to choose whether to log on as a registered user or—if the system administrator has enabled this option—as a guest.

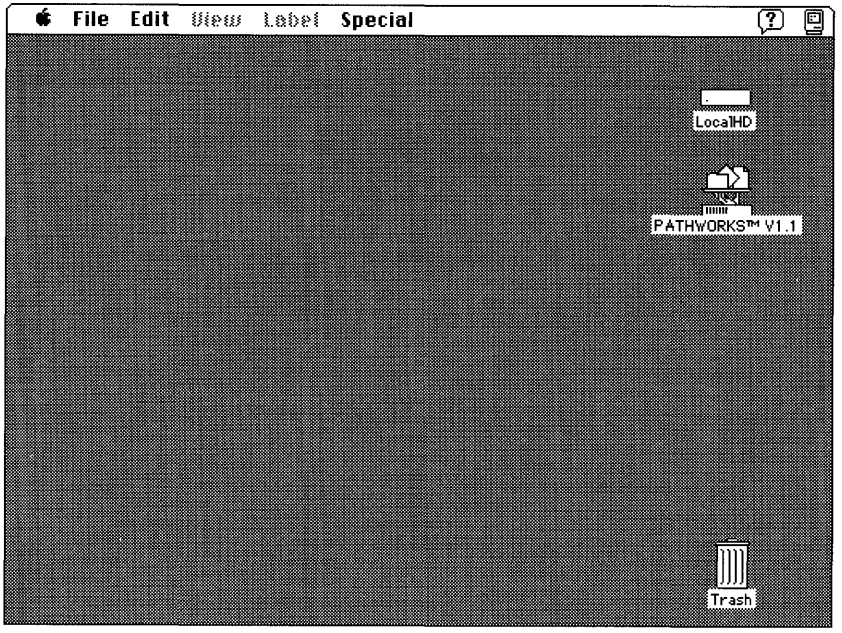
e. If you have a VMS™ account on the VAX that is running the file server, select Registered User and enter your user name and password. Otherwise, select Guest. Click the OK button. (If you want to select Guest and the Guest option is unavailable, see your system administrator.)

   A dialog box appears, listing the server volumes available on the file server that you selected.

f. Select the PATHWORKS V1.1 volume and click the OK button.

g. Close the Chooser window.

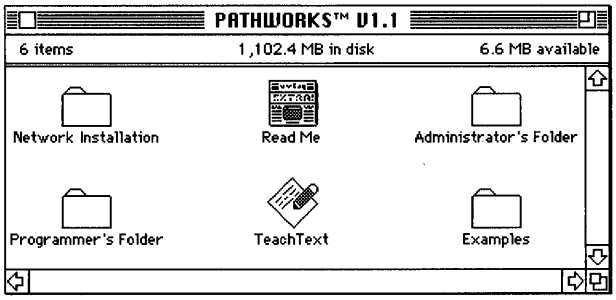
The PATHWORKS V1.1 volume should soon appear on your Macintosh desktop.



3 Open the PATHWORKS V1.1 volume.

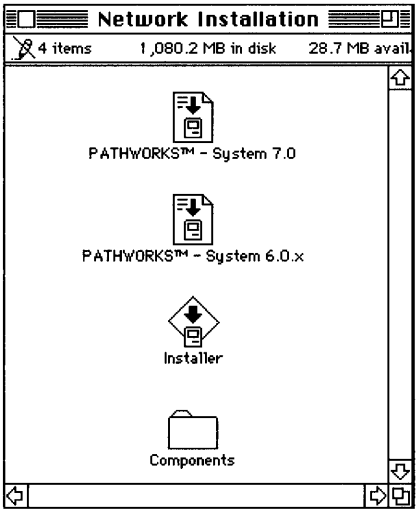
The volume contains the following components:

- Network Installation folder.
- Read Me document.
- TeachText application program. This program lets you open the Read Me document.
- Administrator's Folder. This folder contains support files and utilities for system administrators. You do not need to do anything with this folder if you are not a system administrator.
- Programmer's Folder. This folder contains support files and utilities for programmers. You do not need to do anything with this folder if you are not a programmer.
- Examples folder. This folder contains mBin, a MacBinary converter (for more information, see the section "Working with Documents on a VAXshare File Server" in Chapter 2 of the *Using Network Services* part of this binder). This folder also contains Backup-Mac.Com, an automatic backup utility that works on Macintosh computers using DECnet software.



4 Open the Network Installation folder.

The Network Installation folder contains the PATHWORKS Installer program, the PATHWORKS™-System 7.0 script, the PATHWORKS™-System 6.0.*x* script, and the Components folder. The Components folder contains the software resources used by the Installation scripts.

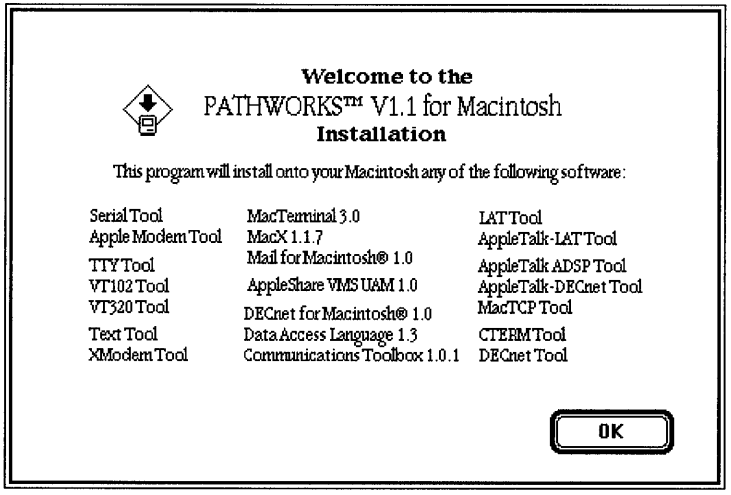


5 Start the Installer program.

a. To start the program in a version 7.0 environment, drag the PATHWORKS™-System 7.0 icon to the Installer program icon (so that the tip of the pointer is on the program icon).

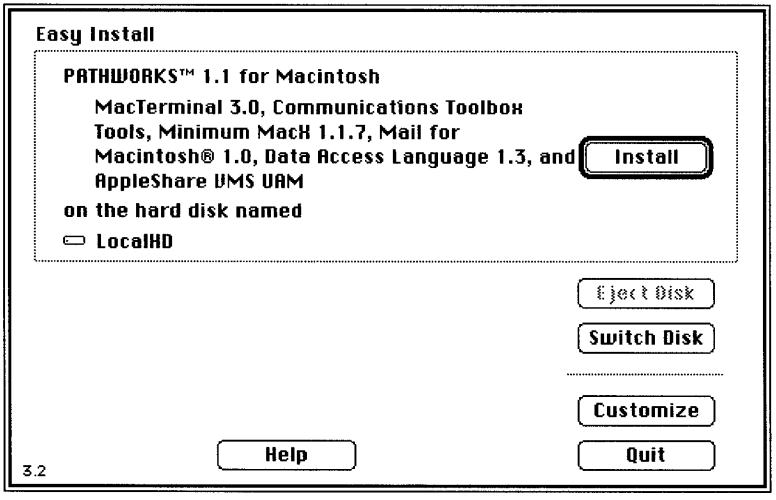
b. To start the program in a version 6.0.*x* environment, hold the Shift key down as you click the PATHWORKS™-System 6.0.*x* script icon and the Installer program icon. Then double-click either of these two icons.

The program displays an Installer dialog box that contains general information about installing PATHWORKS for Macintosh software components.



6 Click the OK button.

The Installer program displays the Easy Install dialog box.



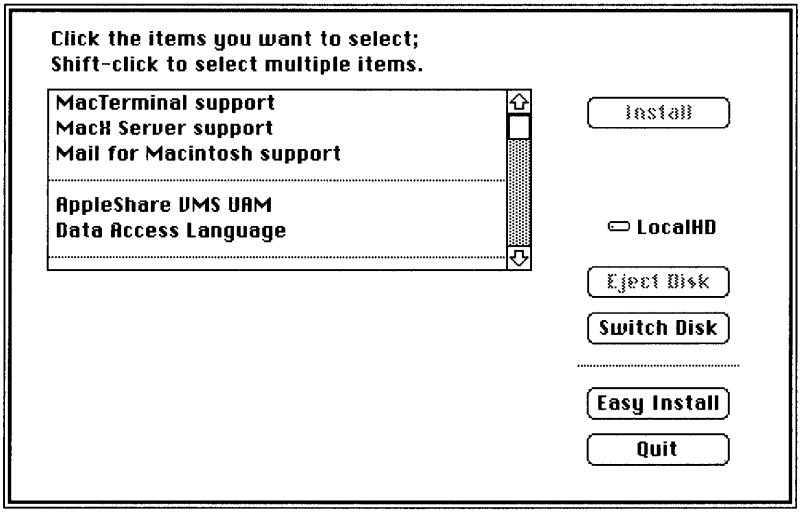
◆ **Note** If you click the Install button, you initiate the Easy Install installation method described in the previous section, "Installing the Software Using the Easy Install Option." ◆

7 **Make sure that the disk indicated in the Easy Install dialog box is the one on which you want to install the PATHWORKS for Macintosh software.**

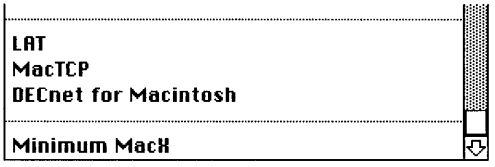
If the disk named in the dialog box is not the one on which you want to install the software, click the Switch Disk button until the correct disk name appears.

8 **Click the Customize button.**

The custom-install dialog box appears.



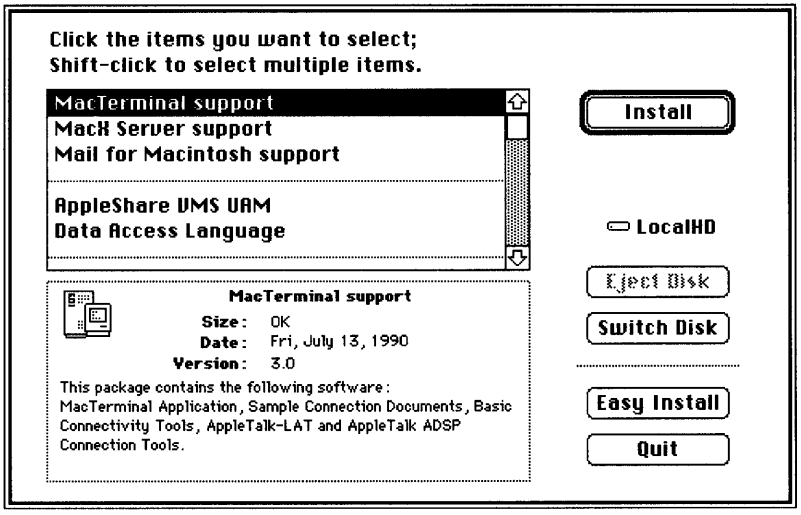
Scroll down to view all of the services that you can install.



9 **Select the individual services that you want to use.**

Shift-click to add multiple services or to remove them from your group of selections.

An explanation of the software components that you've chosen appears near the bottom of the dialog box.

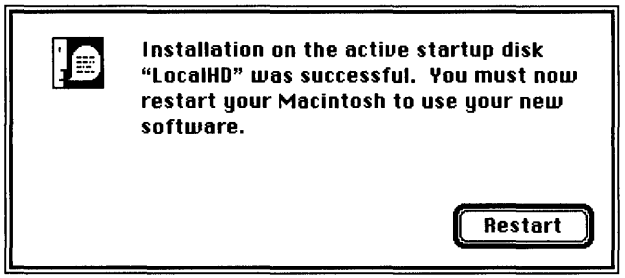


10 **Click the Install button.**

The Installer displays an Installer status dialog box that keeps you informed on the progress of the installation.

11 **When you have successfully completed the installation, a dialog box appears that tells you what to do next.**

Two different dialog boxes appear, depending on the services that you installed. When you install some services, a dailog box appears that tells you to restart your Macintosh computer.



When other services are successfully installed, a dailog box appears that tells you to either click the Continue button if you want to install additional services or click the Quit button if you've finished using the Installer.

About the software components

This section describes the PATHWORKS for Macintosh software components and all the other Macintosh software that supports the network services provided by PATHWORKS for Macintosh. Note that it is *not* necessary for you to know about all of the individual pieces of software that make up the PATHWORKS for Macintosh package. If you are curious, however, this section will help you understand the functions of the various components and why they are needed.

To find out where this software resides on your Macintosh desktop, refer to the section "Where the Software is Located" later in this chapter. Note that the software is stored in different locations in a version 7.0 environment and a 6.0.*x* environment.

VAXshare file services

A VAXshare file server allows Macintosh computer users to store, access, and share files that are stored on VAX computers. File services software includes the following components:

- **AppleShare** (system file resource)—provides access to AppleShare and VAXshare file and print services.
- **AppleShare Prep** (prep file)—contains your AppleShare settings.
- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connected to the network through an Ethernet card.
- **VMS UAM**—provides an alternative log-on method (also known as a *user authentication method,* or *UAM*) for logging on to VAXshare file servers. VMS UAM lets you use a VMS password of up to 31 characters.

VAXshare print services

PATHWORKS for Macintosh lets you use a VAX computer as a server for printing files on network printers. Print services software includes the following components:

- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connected to the network through an Ethernet card.
- **Laser Prep** (prep file)—provides a dictionary of the most frequently used PostScript commands. Unlike other prep files, this file is required to use a PostScript printer from your Macintosh computer. This component is used only if your Macintosh is running version 6.0.*x*.
- **LaserWriter**—provides resources for the Chooser window and provides a network connection path to a LaserWriter® printer.

Terminal services

Terminal services are services on VAX computers that you can access from a computer terminal. Terminal services software includes the following components:

- **ADSP** (communications driver)—provides support for the ADSP communications protocol.
- **Connection Tools**—Communications Toolbox tools that define the type of connection established between your Macintosh and the VAX computer or Digital network. The following connection tools are provided:
  - **Apple Modem Tool**—provides modem connections for the MacTerminal program.
  - **AppleTalk ADSP Tool**—provides AppleTalk Data Stream Protocol connections for MacTerminal.
  - **AppleTalk-LAT Tool**—provides LAT connections for Macintosh computers on any AppleTalk network including LocalTalk local area networks (LAN).
  - **LAT Tool**—provides LAT connections for Macintosh computers on Ethernet LANs.
  - **Serial Tool**—provides serial connections for MacTerminal.
- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connected to the network through an Ethernet card.
- **File Transfer Tools**—Communications Toolbox tools that ensure files are transferred intact between your Macintosh and the VAX computer or Digital network. The following file transfer tools are provided:
  - **Text Tool**—used to send files that contain only text.
  - **XMODEM Tool**—provides a method of transferring data between two computers that includes error-checking and correction.
- **LAT** (Control Panel and communications driver)—provides resources for the Control Panel and permits your Macintosh to communicate by using the LAT communications protocol.
- **LAT Prep** (prep file)—contains information about services on the network.
- **MacTerminal** (application program)—allows your Macintosh computer to emulate a Digital terminal. With MacTerminal and communications tools, you can gain access to terminal services on a VAX computer.

- **Macintosh Communications Toolbox**—an extension to the Macintosh system software that manages communications tasks for Macintosh application programs. The Communications Toolbox works in conjunction with communications tools, which perform specific tasks. Macintosh communications programs that support the Communications Toolbox, such as the MacTerminal program, rely on the Communications Toolbox and communications tools to establish connections and take care of other aspects of communicating with remote computers.
- **MacTerminal Documents folder**—contains sample session documents.
- **Terminal emulation tools**—Communications Toolbox tools that determine the type of terminal your Macintosh will emulate during the communications session. The following terminal emulation tools are provided:
  - **TTY Tool**—provides TTY terminal emulation for MacTerminal.
  - **VT102 Tool**—provides VT102 terminal emulation for MacTerminal.
  - **VT320 Tool**—provides VT320 terminal emulation for MacTerminal.
- **Terminal Fonts folder**—provides fonts that allow you to print screens of terminal sessions.

MacX and DECwindows support

MacX provides a Macintosh-based X server that allows you to run DECwindows programs and other X clients that reside on remote computers. The MacX software includes the following components:

- **ADSP** (communications driver)—provides support for the ADSP communications protocol.
- **AppleTalk-DECnet Tool** (connection tool)—provides AppleTalk/DECnet Transport Gateway connections for the MacX program.
- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connected to the network through an Ethernet card.

- **Font Directory** (located in the MacX Fonts folder)—displays and sorts X, Macintosh, and DECwindows fonts, and compiles Adobe Bitmap Distribution Format (BDF) files into X fonts. The Font Directory also permits you to assign aliases to long, unwieldy font names.
- **Hosts (**file)—provides node address and other information for TCP/IP connections to remote computers.
- **Macintosh Communications Toolbox**—an extension to the Macintosh system software that manages communications tasks for Macintosh application programs. The Communications Toolbox works in conjunction with communications tools, which perform specific tasks. Macintosh communications programs that support the Communications Toolbox, such as the MacX program, rely on the Communications Toolbox and communications tools to establish connections and take care of other aspects of communicating with remote computers.
- **MacTCP** (Control Panel and communications driver)—permits your Macintosh to communicate by using the TCP/IP communications protocols.
- **MacTCP Tool** (connection tool)—provides TCP/IP connections for MacX.
- **MacX** (application program)—allows you to access DECwindows programs running on VAX computers.
- **MacX Colors** (file)—contains an array of colors. You can add, modify, or delete colors by using the MacX Color Namer.
- **MacX Fonts folder**—contains files for a variety of fonts. Each file contains a single font. If you install minimum MacX, you will only install two of the fonts from this folder.

◆ **Note** The MacX folder—including the MacX application program, MacX Fonts folder, and other related folders and files—requires approximately 5 megabytes (MB) of disk storage space. ◆

Data Access Language

Data Access Language is a connectivity language included with PATHWORKS for Macintosh that allows Macintosh application programs, such as word processors and spreadsheets, to access data stored in databases on VAX computers. The Data Access Language software includes the following components:

- **ADSP** (communications driver)—provides support for the ADSP communications protocol.
- **AppleTalk ADSP Tool** (connection tool)—a Communications Toolbox tool that provides AppleTalk Data Stream Protocol connections.
- **DAL** (driver)—provides support for the DAL client in version 7.0.
- **DAL6** (driver)—provides support for the DAL client in version 6.0.*x*.
- **DAL Preferences** (file)—a preferences file that tells your program how to make a connection to a DAL server. DAL Preferences is installed and must be configured only if your Macintosh computer is running version 7.0. Note that this file is called hosts.cl1 in version 6.0.*x*. Since some third-party applications still refer to the file as hosts.cl1, you must configure both DAL Preferences and hosts.cl1 if your Macintosh is running version 7.0. The contents of the DAL Preferences file and the hosts.cl1 file are identical.
- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connecting to the network through an Ethernet card.
- **hosts.cl1** (file)—a preferences file that tells your program how to make a connection to a DAL server. This file is called DAL Preferences in version 7.0. You must configure both DAL Preferences and hosts.cl1 if your Macintosh is running version 7.0. The contents of the DAL Preferences file and the hosts.cl1 file are identical.
- **Macintosh Communications Toolbox**—an extension to the Macintosh system software that manages communications tasks for Macintosh programs. The Communications Toolbox works in conjunction with communications tools, which perform specific tasks. Macintosh communications programs that support the Communications Toolbox rely on the Communications Toolbox and communications tools to establish connections and take care of other aspects of communicating with remote computers.

Mail for Macintosh

Mail for Macintosh is a mail program included with PATHWORKS for Macintosh that lets you exchange electronic mail with other users on your network. The Mail for Macintosh software includes the following components:

- **ADSP** (communications driver)—provides support for the ADSP communications protocol.
- **AppleTalk-DECnet Tool** (connection tool)—provides AppleTalk/DECnet Transport Gateway connections for Mail for Macintosh.
- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh computer to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connected to the network through an Ethernet card.
- **Macintosh Communications Toolbox**—an extension to the Macintosh system software that manages communications tasks for Macintosh programs. The Communications Toolbox works in conjunction with communications tools, which perform specific tasks. Macintosh communications programs that support the Communications Toolbox, such as Mail for Macintosh, rely on the Communications Toolbox and communications tools to establish connections and take care of other aspects of communicating with remote computers.
- **Mail for Macintosh Help** (file)—provides on-line help information.
- **PATHWORKS Listener**—provides real-time notification that mail has arrived.

See the PATHWORKS for Macintosh: Mail for Macintosh User's Guide for information on using Mail for Macintosh software.

DECnet for Macintosh

DECnet for Macintosh is a software package included with PATHWORKS for Macintosh that allows your Macintosh computer to become a DECnet node. As a DECnet node, you can establish DECnet connections to VAX computers or other DECnet nodes from your Macintosh. The DECnet software for Macintosh computers includes the following components:

- **CTERM Tool** (connection tool)—provides terminal connections through DECnet.
- **DECnet Control** (control panel)—allows you to control DECnet connections from your Macintosh computer.
- **DECnet Tool** (connection tool)—provides connections through DECnet.
- **DECnet/Mac** (communications driver)—provides support for the DECnet communication protocol.
- **EtherTalk 2.0** (system file resource)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. This software is used only if you are connected to the network through an Ethernet card.
- **Network Control Program** (application program)—allows you to configure and examine your DECnet network configuration from your Macintosh computer.
- **NetCopy** (application program)—allows you to access, copy, and print files on any remote system connected to your Macintosh through DECnet.

You can use the DECnet Tool with MacX software to access DECwindows programs over a DECnet connection. You can use the CTERM Tool with the MacTerminal program to access terminal services over a DECnet connection.

See the *Using DECnet for Macintosh* part of this binder for information about using DECnet for Macintosh software.

Where the software is located

The following table shows where the PATHWORKS for Macintosh software components are installed for both system software environments, version 7.0 and 6.0.*x*. The table includes Macintosh software that supports PATHWORKS for Macintosh.

PATHWORKS software component	Located in the System Folder 7.0	6.0.x	System 7.0	System 6.0.x
ADSP	✓		 System	 System Folder
Apple Modem Tool	✓	✓	 Extensions	 Communications Folder
AppleShare	✓	✓	 Extensions	 System Folder
AppleShare Prep	✓	✓	 Preferences	 System Folder
AppleTalk ADSP Tool	✓	✓	 Extensions	 Communications Folder
AppleTalk-DECnet Tool	✓	✓	 Extensions	 Communications Folder
AppleTalk-LAT Tool	✓	✓	 Extensions	 Communications Folder
CTERM Tool	✓	✓	 Extensions	 Communications Folder
DAL	✓		 Extensions	not in version 6.0.x
DAL6			not in version 7.0	 System Folder
DAL Preferences	✓		 Preferences	see hosts.cl1

PATHWORKS software component	Located in the System Folder 7.0	6.0.x	System 7.0	System 6.0.x
DECnet Control	✓		 Control Panels	 System Folder
DECnet/Mac	✓		 Extensions	 System Folder
DECnet Tool	✓	✓	 Extensions	 Communications Folder
EtherTalk 2.0	✓		 Extensions	 System Folder
Hosts	✓		 Preferences	 System Folder
hosts.cl1			 System Folder	 System Folder
Laser Prep			not in version 7.0	 System Folder
LaserWriter	✓		 Extensions	 System Folder
LAT	✓		 Control Panels	 System Folder
LAT Preferences	✓		 Preferences	 System Folder
LAT Tool	✓	✓	 Extensions	 Communications Folder

PATHWORKS software component	Located in the System Folder 7.0	Located in the System Folder 6.0.x	System 7.0	System 6.0.x
Macintosh Communications Toolbox	✓	✓	 System	 System
MacTCP	✓		 Control Panels	 System Folder
MacTCP Tool	✓	✓	 Extensions	 Communications Folder
MacTerminal			 MacTerminal Folder	 MacTerminal Folder
MacTerminal Documents			 MacTerminal Folder	 MacTerminal Folder
MacX			 MacX Folder	 MacX Folder
MacX Colors			 MacX Folder	 MacX Folder
MacX Font Directory			 MacX Fonts	 MacX Fonts
MacX Fonts folder			 MacX Folder	 MacX Folder
Mail for Macintosh			 Mail for Macintosh ®	 Mail for Macintosh ®
Mail for Macintosh Help	✓		 System Folder	 System Folder

PATHWORKS software component	Located in the System Folder 7.0	Located in the System Folder 6.0.x	System 7.0	System 6.0.x
NCP			 DECnet for Macintosh ®	 DECnet for Macintosh ®
NetCopy			 DECnet for Macintosh ®	 DECnet for Macintosh ®
PATHWORKS Listener	✓		 Extensions	 System Folder
Serial Tool	✓	✓	 Extensions	 Communications Folder
Terminal Fonts			 MacTerminal Folder	 MacTerminal Folder
Text Tool	✓	✓	 Extensions	 Communications Folder
TTY Tool	✓	✓	 Extensions	 Communications Folder
VMS UAM	✓	✓	 AppleShare Folder	 AppleShare Folder
VT102 Tool	✓	✓	 Extensions	 Communications Folder
VT320 Tool	✓	✓	 Extensions	 Communications Folder
XMODEM Tool	✓	✓	 Extensions	 Communications Folder

Troubleshooting

If you have trouble with the installation process, check for the following conditions:

When attempting to mount the file server, you entered a password with more characters than the maximum number allowed.

You cannot mount the PATHWORKS V1.1 volume because the password is greater than eight characters and VMS UAM is not installed on your system. Get a copy of VMS UAM from your system administrator and install it or have your system administrator change the password to a name that has eight or fewer characters.

To install and use PATHWORKS for Macintosh version 1.1 on the selected drive, you need to quit the Installer and run the PATHWORKS-System 7.0 (or 6.0*x*) script.

The system software on the disk on which you're trying to install PATHWORKS software does not match the script document you selected to start the Installer program. For instance, you tried to use the PATHWORKS™-System 7.0 script document to install PATHWORKS software on a disk running version 6.0.*x*. Click the Switch Disk button to select a disk that is running the correct system software or click the Quit button to quit the Installer and start again using the appropriate script document.

To install and use PATHWORKS for Macintosh version 1.1 on the selected drive, you need a minimum of 2 megabytes (MB) of RAM.

You tried to use the Easy Install option on a Macintosh computer with less than 2 MB of memory. With your memory limitation, you can use the Customize option to install LAT, MacTCP support, and minimum Data Access Language; to install all other PATHWORKS components, you need at least 2 MB of memory.

To install and use PATHWORKS for Macintosh version 1.1 on the selected drive, you need a hard disk and Macintosh system software version 6.0.4 or later.

You cannot install PATHWORKS on a floppy disk. If you tried to install PATHWORKS on a disk running an old version of system software, update your system software to 6.0.4 or later.

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Chapter 3 VAXshare Print Services

Chapter 4 Terminal Services

Chapter 5 MacX and DECwindows Programs

Chapter 6 Data Access Language

Appendix A Network Basics

Appendix B VAXshare Management Command Reference

Preface

PATHWORKS™ for Macintosh® allows you to use your Macintosh computer to access services running on Digital Equipment Corporation VAX™computers. This preface tells you what you'll find in this part of the *Network Services User's Guide*. For information about the other four user's guides that come with PATHWORKS for Macintosh, and suggestions for using the guides, see the *Overview of the User's Guides* at the beginning of this binder.

What you need to know

Using Network Services is intended for Macintosh users who may or may not be familiar with Digital computers. A basic understanding of computer networks will be helpful to you. If you need an overview of network terms and concepts, you may want to read Appendix A.

If you are new to Macintosh computers, see your owner's guide for information on setting up your computer. You may also want to use the tutorial disk that came with your Macintosh to learn how the Macintosh operates. You should be familiar with basic Macintosh techniques such as clicking, double-clicking, and dragging the mouse; working with windows; pulling down menus and choosing commands; and using the Clipboard to store information. For information on Macintosh terms and techniques, see the appropri-ate manuals that came with your Macintosh computer.

You need not be an experienced VAX computer user to read *Using Network Services*. However, if you plan to log in to a VAX, you'll need to know how to interact with the VMS™ operating system. If you plan to access terminal services or DECwindows™

applications, you'll need to know how to interact with those services or applications, and perhaps the operating system as well. Helpful references are listed in "For More Information," later in this Preface.

What this part contains

Here is a description of what's covered in this part of the *Network Services User's Guide*.

- Chapter 1, "Introduction," gives an overview of the product, describes the various methods by which your Macintosh can be physically connected to a VAX computer or Digital network, and briefly describes the Digital services you can access.
- Chapter 2, "VAXshare™ File Services," tells you how to select and use a VAX file server from your Macintosh.
- Chapter 3, "VAXshare Print Services," tells you how to select and use a VAX print server from your Macintosh.
- Chapter 4, "Terminal Services," tells you how to use your Macintosh to access terminal services on VAX computers. This chapter introduces MacTerminal®, an application program that lets you log in to the VMS operating system. This chapter also discusses the communications tools used with MacTerminal, gives log-in procedures, and introduces the Digital Command Language (DCL).
- Chapter 5, "MacX and DECwindows Programs," tells you how to use the MacX™ program to access DECwindows programs running on VAX computers.
- Chapter 6, "Data Access Language," gives you an overview of Data Access Language (DAL), a connectivity language that some of your desktop applications may use to access data stored in databases on VAX computers.
- Appendix A, "Network Basics," explains how networks operate and how they are put together. It also describes the various kinds of hardware configurations and communications protocols that can be used to connect Apple® and Digital networks.
- Appendix B, "VAXshare Management Command Reference," describes DCL commands that you can use to create volumes and make them available on the network, and to perform other VAXshare management tasks. Some of the commands are relevant to VAXshare print servers; most of them are used to manage VAXshare file servers.

Note that a glossary and an index are provided at the end of the binder.

For more information

For information about VAX computers, see the following manuals:

- *VMS User's Manual.* Digital Equipment Corporation, April 1988. (VMS Version 5.0.)
- *Guide to DECnet-VAX Networking* (VMS Management Volume 5A).
- *Writing Real Programs in DCL.* Digital Press, 1989.

For information about AppleTalk® networks, consult these books:

- *Understanding Computer Networks.* Apple Computer, Inc., 1989.
- *AppleTalk Network System Overview.* Addison-Wesley, Inc., 1989.

For information about DECwindows programs, refer to these manuals:

- *VMS DECwindows User's Guide.* Digital Equipment Corporation, October 1989. (VMS Version 5.3.)
- *VMS DECwindows Desktop Applications Guide.* Digital Equipment Corporation, October 1989. (VMS Version 5.3.)

Also see the manual provided by Digital for each DECwindows program. Some of these manuals are listed in Chapter 5.

Your local Digital representative can tell you how to obtain Digital publications.

1 Introduction

This chapter gives an overview of PATHWORKS™ for Macintosh® and describes the VAX™ network services that you can access from your Macintosh computer.

About PATHWORKS for Macintosh

PATHWORKS for Macintosh is not just a single Macintosh application program. Rather, the product includes many components—programs, communications tools, utilities, and numerous other pieces of software. Some of these components run on your Macintosh computer. Others reside on Digital VAX computers. Many of these components are invisible to you as a user but are important to the system as a whole. Together, the components of PATHWORKS for Macintosh provide access to services available on VAX computers through your Macintosh and its easy-to-use interface.

The next section describes different ways in which your Macintosh can be connected to Digital networks or VAX computers, and how the connection type influences your use of PATHWORKS for Macintosh. The section that follows lists the services that you can access with this product. It gives a brief description of each service and points you to a chapter in *Using Network Services* or another book that explains how to use that service. (You'll need to install PATHWORKS for Macintosh software components on your Macintosh computer before you can use a given service. For installation details, see the *Installation* part of this binder.)

How are you connected?

This product is designed primarily for users whose Macintosh computers are connected to Digital computer networks. Figure 1-1 shows the two ways in which your Macintosh computer is likely to be connected to a network of VAX computers.

In the figure, the Macintosh computer at the upper left is linked to the Ethernet environment through its connection to a LocalTalk® network and a **router.** The Macintosh at the lower left is connected to the Ethernet environment directly by means of an Ethernet card, such as the Apple® EtherTalk NB Card. Throughout *Using Network Services,* figures similar to Figure 1-1 show the possible network connections and the software components required for the particular service being described. See Appendix A for more information about network connections.

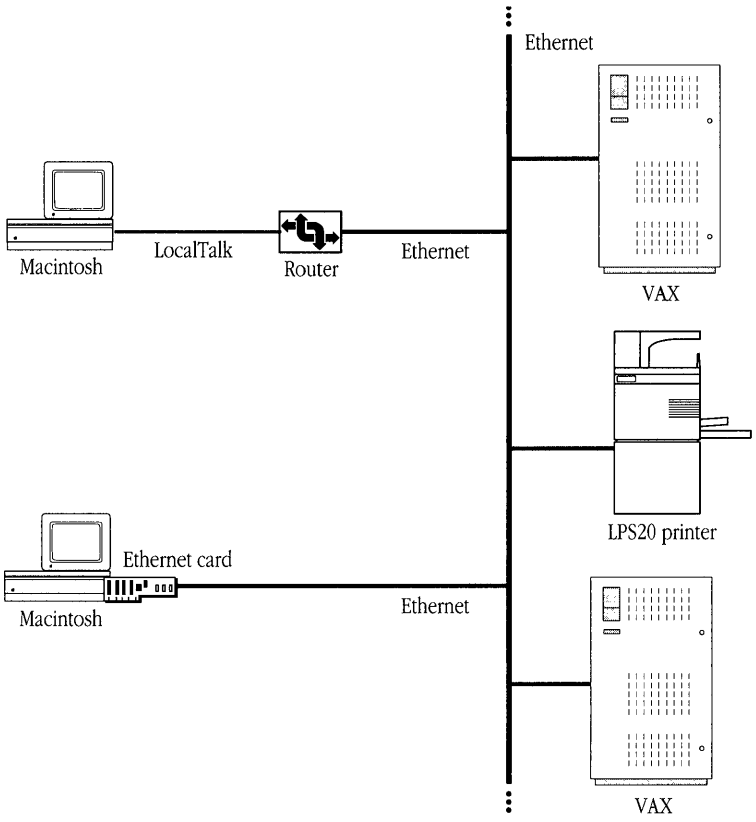


Figure 1-1 Macintosh computers connected to a Digital computer network

If your Macintosh is *not* connected to a network, you may still be able to use some of the services provided by PATHWORKS for Macintosh. Figure 1-2 shows two Macintosh computers connected directly to a single VAX computer, one through a modem link and the other through a serial cable. Both types of connections let you use VAX terminal services as described in Chapter 4.

◆ **Note** You can set up an asynchronous DECnet™ connection for file transfer and terminal services as described in the *Using DECnet for Macintosh* part of this binder. ◆

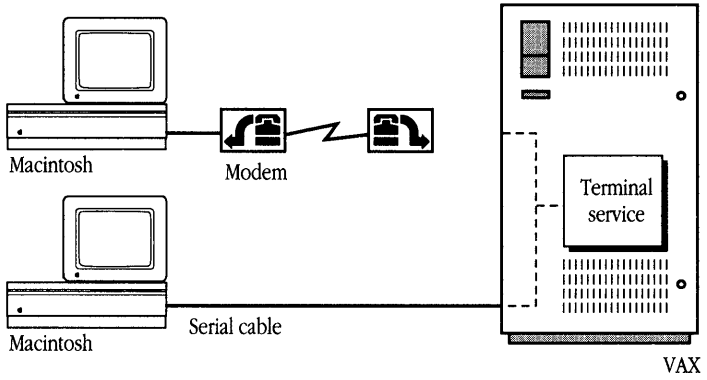


Figure 1-2 Serial and modem connections to a VAX computer

Network services that you can access

PATHWORKS for Macintosh provides access to a number of different services that run on VAX computers.

The services you can access include

- VAXshare™ file services
- VAXshare print services
- terminal services
- DECwindows™ programs
- Data Access Language
- Mail for Macintosh
- ALL-IN-1 MAIL for Macintosh
- DECnet for Macintosh
- MacTCP®

The sections that follow give brief descriptions of each service.

VAXshare file services

A **VAXshare file server** lets you store, access, and share Macintosh files on a VAX computer. You can determine whether other users may open and read a folder's contents (that is, files and other folders) and whether they can make and save changes to the folder's contents. Chapter 2 describes VAXshare file services.

VAXshare print services

PATHWORKS for Macintosh lets you use a VAX computer as a server for printing files on network printers, including Digital high-speed, high-resolution **PostScript**® printers and Apple LaserWriter® printers. You can submit a job to a print server on the VAX and then use your Macintosh for other tasks. The print server stores your file until the printer is ready for it, and then sends the file to the printer. Chapter 3 describes VAXshare print services.

Terminal services

Terminal services are services on VAX computers that you can access from a computer terminal. MacTerminal®, an application program supplied with PATHWORKS for Macintosh, allows your Macintosh computer to act as a terminal. Chapter 4 describes MacTerminal and the communications tools that MacTerminal uses to connect to terminal services. For details on using MacTerminal and communications tools, see the *PATHWORKS for Macintosh: MacTerminal User's Guide.*

DECwindows programs

The **MacX**™ program, supplied with PATHWORKS for Macintosh, is an implementation of the **X Window System** for the Macintosh computer. MacX lets you use your Macintosh to access **DECwindows application programs** running on VAX computers, such as DECwrite, DECdecision, Calendar, and VAXnotes.

Chapter 5 gives an overview of the MacX program and the X Window System. That chapter tells you how to start MacX and access DECwindows programs by using the AppleTalk-DECnet Connection Tool. The *PATHWORKS for Macintosh: MacX User's Guide* explains in detail how to use MacX, including the use of the MacTCP Connection Tool, which allows you to make a TCP/IP connection and the DECnet connection tool, which allows you to make a DECnet connection. Refer to Digital's user manuals (such as *DECchart: Getting Started)* for information about individual DECwindows programs.

Data Access Language

Data Access Language (DAL), a connectivity language supplied with PATHWORKS for Macintosh, allows Macintosh programs such as word processors, query tools, or spreadsheets to access data stored in databases on VAX computers.

Chapter 6 gives an overview of Data Access Language. It describes preferences files, called *hosts.cl1* and *DAL Preferences*, that tell the DAL software on your Macintosh computer how to connect to a VAX computer. It also describes tools that verify that DAL software is properly installed on your computer. If you want detailed information about how to configure these preferences files and use the tools, refer to the *PATHWORKS for Macintosh: Client Administrator's Guide.* If you are a technical user who wants to write DAL programs, refer to the *PATHWORKS for Macintosh: Data Access Language Programmer's Reference.*

Mail for Macintosh

Mail for Macintosh, one component of PATHWORKS for Macintosh, is an application program that connects to and works with VAXmail servers to provide electronic mail services to Digital VAX networks. Using Mail for Macintosh, you can log in to a VAXmail server and exchange mail with other users on the network. For details about using Mail for Macintosh, refer to the *PATHWORKS for Macintosh: Mail for Macintosh User's Guide.*

ALL-IN-1 MAIL for Macintosh

PATHWORKS for Macintosh includes an ALL-IN-1 MAIL for Macintosh client license (the software is distributed separately by Digital). The ALL-IN-1 MAIL for Macintosh program provides key electronic mail capabilities such as store and forward services and message-delivery notifications. In addition, ALL-IN-1 MAIL for Macintosh implements all the mandatory services defined by the 1984 CCITT X.400 recommendations. The services provided allow you to create, edit, file, and manipulate messages within their file cabinets. A personal address book is included for storing the name, nickname, phone number, and mail address for personal use.

DECnet for Macintosh

DECnet software for the Macintosh computer, supplied with PATHWORKS for Macintosh, allows Macintosh computers to participate in a DECnet network, and makes DECnet nodes and services accessible to your Macintosh. DECnet services include remote file access, electronic mail, terminal services, and task-to-task communication. The *Using DECnet for Macintosh* part of this binder describes how to use your Macintosh computer to participate in DECnet computer networks.

MacTCP

MacTCP® software, supplied with PATHWORKS for Macintosh, is Apple Computer's implementation of the TCP/IP family of protocols for the Macintosh Operating System. MacTCP is composed of two specialized software modules that allow your Macintosh computer to communicate over a TCP/IP network: the MacTCP driver and the MacTCP Connection Tool. The driver processes data passing to and from the Macintosh port connected to the TCP/IP network. The connection tool works in conjunction with the Macintosh Communications Toolbox, which manages communication tasks for the MacX application program.

2 VAXshare File Services

A VAXshare file server allows Macintosh computer users to store, access, and share files on VAX computers. Because VAX computers often provide very large shared-storage devices, which support file-server connections for many different types of computers, VAXshare can greatly increase the file-storage and file-sharing potential available to your Macintosh computer. In addition, VAXshare file servers may be faster than other file servers that you might use.

This chapter tells you how to log on to a VAXshare file server and mount file-server volumes, as well as how to define who can access information that you store on a VAXshare file server. It also gives troubleshooting hints that may help if you have trouble logging on to a VAXshare file server or finding a file on the file server.

If you are already familiar with AppleShare® file servers, you may want to read just the section "Differences Between VAXshare and AppleShare File Servers," which describes differences relating to the log-on process and to working with documents on VAXshare file servers.

Overview of VAXshare file servers

VAXshare file servers work very much like **AppleShare file servers,** with which you may already be familiar. AppleShare file servers allow documents, folders, and programs to be stored and shared on an AppleTalk network system.

A VAXshare file server is basically an AppleShare file server that runs on a VAX computer and uses the VAX computer's hard disk as its storage device. Besides the greater storage capacity of VAX hard disks, VAXshare offers an extra level of security—the system administrator can set up passwords for each VAXshare volume.

VAXshare lets you share files with VMS™ users. You can mount both VAXshare and AppleShare file-server volumes on your desktop at the same time.

VAXshare translates the VMS hierarchical directory structure into the system of files and folders that is familiar to Macintosh users. Each VMS directory becomes a folder, and the files within a directory appear as the contents of the Macintosh folder corresponding to that directory.

To use VAXshare file servers, you install the AppleShare workstation software on your Macintosh computer. The AppleShare workstation software lets your Macintosh act as a **client** to both VAXshare and AppleShare file servers. If you install the **VMS UAM** file in the AppleShare folder in your System Folder, you can use a password more than eight characters in length to access VAXshare file servers.

Figure 2-1 shows the software and hardware components involved in using a VAXshare file server. Note that the software components can be found in the folders indicated in this figure only if the Macintosh is running system software version 7.0. To find out where these components are installed in a version 6.0.*x* environment, see the section "Where the Software Is Located" in the *Installation* part of this binder.

◆ **Note** If the symbols and terminology shown in Figure 2-1 are unfamiliar to you, you may want to read Appendix A, which discusses network terms and concepts. ◆

PATHWORKS for Macintosh includes a set of Digital Command Language (DCL) commands that you can use to perform management tasks relating to VAXshare file servers, such as creating file-server volumes and making them available on the network. For information about these commands, see Appendix B.

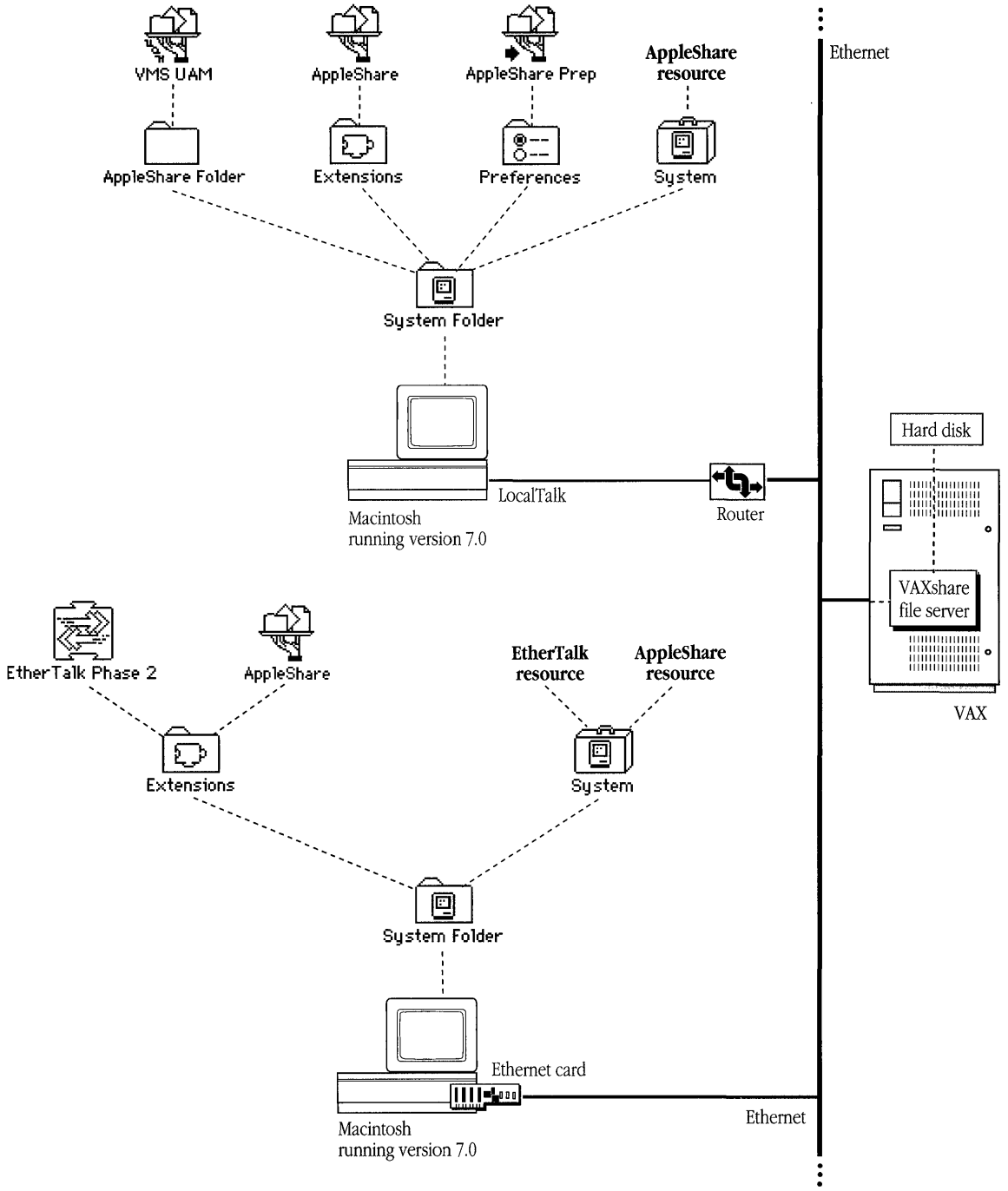


Figure 2-1 Network components for VAXshare file services

Using a VAXshare file server

Each VAXshare file server is made up of at least one **volume.** A volume is a storage device—or a part of a storage device—such as a hard disk, that appears and acts like a separate device (hard disk). To use a VAXshare file server, you log on to the file server and then **mount** the volumes that you want to access—that is, display an icon on your desktop for each volume.

You can log on to a VAXshare file server in two ways:

- as a registered user with user name and password
- as a guest

The way you log on determines what **access privileges** you have. If you log on as a guest, you will be able to see, open, and change certain folders, but it's likely that you will have access to fewer folders than you would as a registered user.

Access privileges are discussed later in this chapter. The sections that follow give step-by-step instructions for accessing a VAXshare file server as a registered user and as a guest.

Logging on and mounting volumes as a registered user

Before you can log on to a file server as a registered user, your system administrator must set up an account for you on the VMS system. Your system administrator can tell you whether or not you have an account and give you your VMS user name and password, which you need to log on. (Usually, you can change your password at any time by logging in to the VMS operating system, as described in Chapter 4. If your system administrator has enabled the capability, you can also change your password from the Chooser.)

The Chooser desk accessory lets you select the file server that you want to access. After you select a file server, you can select the alternate **log-on method,** called *VMS UAM,* if you've installed it on your Macintosh. (See the *Installation* part of this guide for instructions on installing VMS UAM.)

The log-on method that you use determines two things: the maximum password length, and whether or not you can have selected server volumes appear on your desktop automatically when you start up your computer. If you use the preset (default) log-on

method, **Apple Standard,** your password is limited to eight characters, and you are given the opportunity to select server volumes that appear at startup. (If you specify startup volumes, you won't have to log on to the file server and mount the volumes each time you want to use VAXshare.) If you select the VMS UAM log-on method, your password can be up to 31 characters in length, but you cannot specify startup volumes.

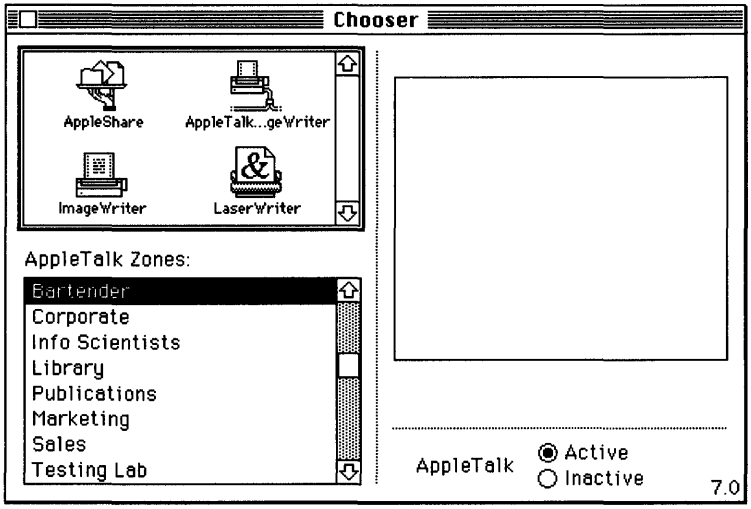
The rest of this section takes you through the log-on procedures step by step. Note that if your Macintosh is connected to more than one network, you need to follow the steps given in "Selecting a Network Connection," later in this chapter, before you perform the procedure given here.

To log on and mount file-server volumes as a registered user:

1 **Select the file server that you want to use.**

a. Open the Chooser from the Apple (🍎) menu.

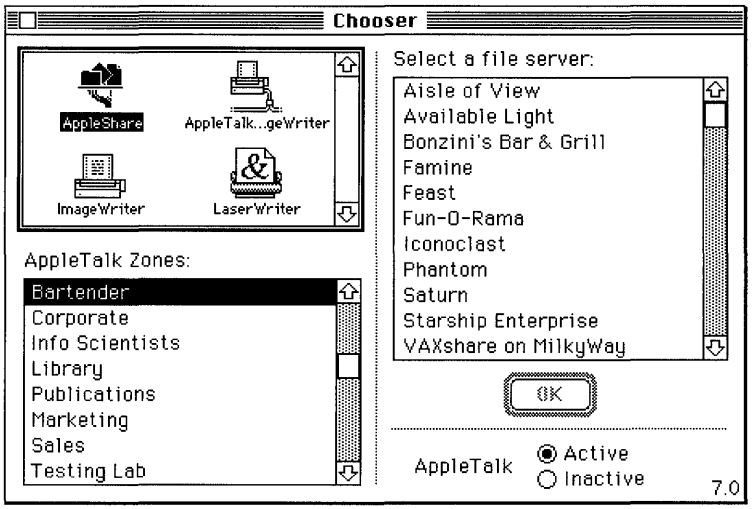
The Chooser window appears.



b. Make sure that your Macintosh computer is physically connected to the network, and select the Active option for AppleTalk, in the lower-right corner of the window.

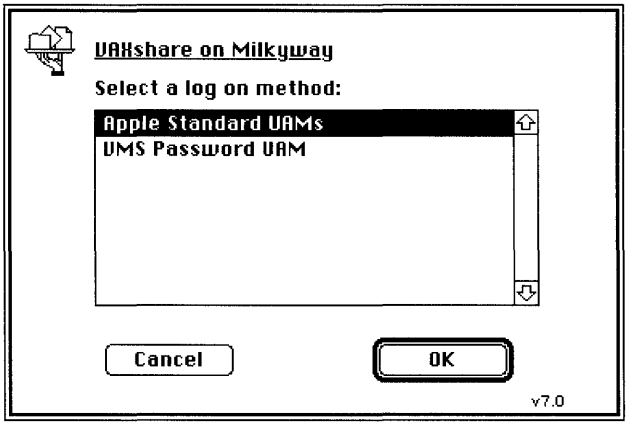
c. Click the AppleShare icon in the group of icons on the left side of the Chooser window.

The Chooser searches for VAXshare as well as AppleShare file servers, and displays a list of available servers in the upper-right corner of the Chooser window.



d. If your network is divided into **zones,** select the zone that has the file server you want to use. The list of available zones appears in the lower-left corner of the window.

e. Select the file server that you want to use, and click the OK button.
If you've installed VMS UAM, a dialog box appears to let you select a log-on method.

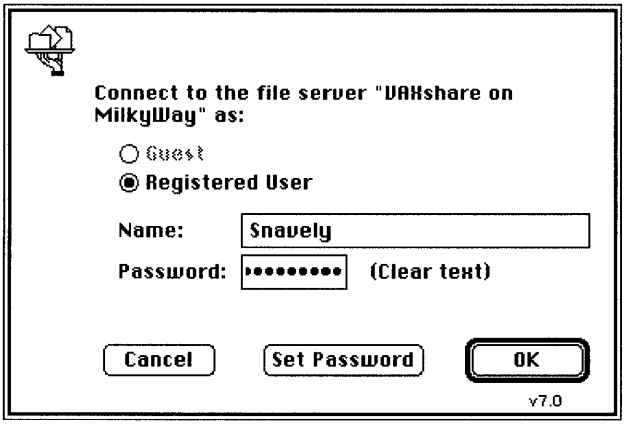


2 **Select a log-on method, and click the OK button.**

Apple Standard lets you use a VMS password of up to eight characters. (This method allows you to have server volumes appear on your desktop automatically at startup time. The steps for specifying startup volumes are given later in this section.)

VMS UAM lets you use a VMS password of up to 31 characters. If you use this method, you will not be able to log on as a guest. If you want to log on as a guest, you must use the Apple Standard method.

A dialog box appears that allows you to identify yourself and to choose whether to log on as a registered user or as a guest. (For the latter option, see "Logging On and Mounting Volumes as a Guest," later in this chapter.)



◆ **Note** Logging on to VAXshare is subject to the same restrictions as logging in to the VMS system on the network. That is, if you do not enter a valid user name and password, you cannot log on, and an alert box appears. Click the OK button. Make sure that your user name and password are correct, and type them again. If the problem persists, consult your system administrator. ◆

3 Connect to the server.

a. Select Registered User.

b. Enter your VMS user name and password, and click the OK button.

A dialog box appears, listing the server volumes available on the file server that you selected.

If the dialog box does not appear, there is a problem with the network. Contact your system administrator.

4 If you want to, select one or more volumes and select a startup option.

a. Scroll through the list, if necessary, to find the volumes that you want. You select a single volume by clicking its name. You can select two or more names by Shift-clicking (that is, by holding down the Shift key while you click each volume name).

If a volume name is dimmed, either that volume already appears on your desktop or you do not have access privileges for that volume.

b. If your log-on method is Apple Standard, you can specify volumes to appear on your desktop automatically whenever you start your computer. Check the box (to the right of the volume name) for each volume that you want to appear. For example, the following figure shows the volume PATHWORKS V1.1 selected as a volume to appear at system startup time.

c. Select a startup option.

   If you select Save My Name Only, VAXshare will prompt you for your password each time you start your computer.

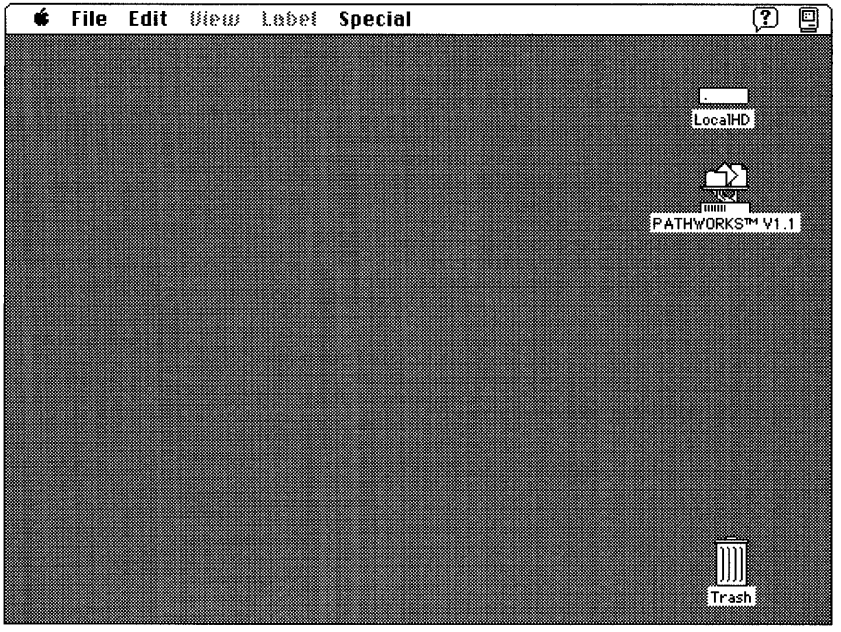
   If you select Save My Name and Password, you won't have to enter your password at startup time; the volumes you've selected will appear on your desktop.

d. Enter the volume password if you are prompted to do so.

   Ask your system administrator for the password if you don't know it.

5 **Click the OK button and close the Chooser window.**

The icon for each volume that you selected appears on your desktop. Note that the icon for a VAXshare file server looks different from the icon for an AppleShare file server.



Logging on and mounting volumes as a guest

VAXshare allows guests to log on to a file server and mount file-server volumes without using a password. As a guest, you can create and use folders on the server, just as a registered user can.

There are two differences between guests and registered users. First, guests have only those access privileges available to everyone. Second, folders created by guests are available to and subject to change by everyone.

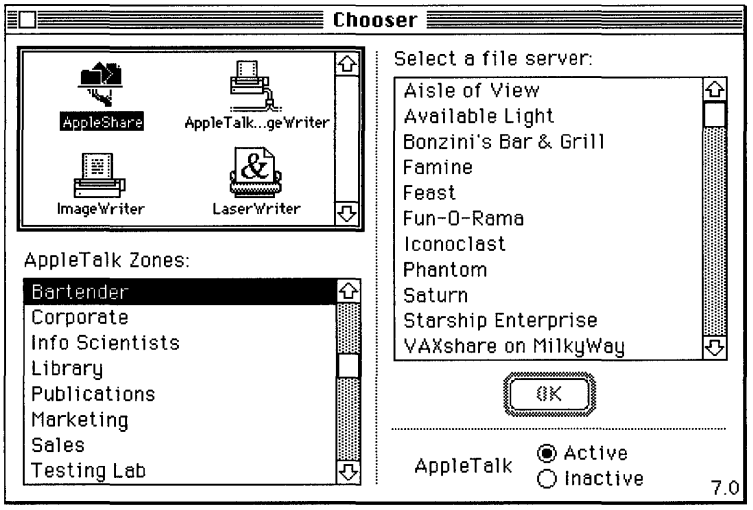
The rest of this section takes you through the log-on procedures step by step. Note that if your Macintosh computer is connected to more than one network, you need to follow the steps given in "Selecting a Network Connection," later in this chapter, before you perform the procedure given here.

To log on and mount file-server volumes as a guest:

1 **Select the file server that you want to use.**

a. Open the Chooser from the Apple (🍎) menu.

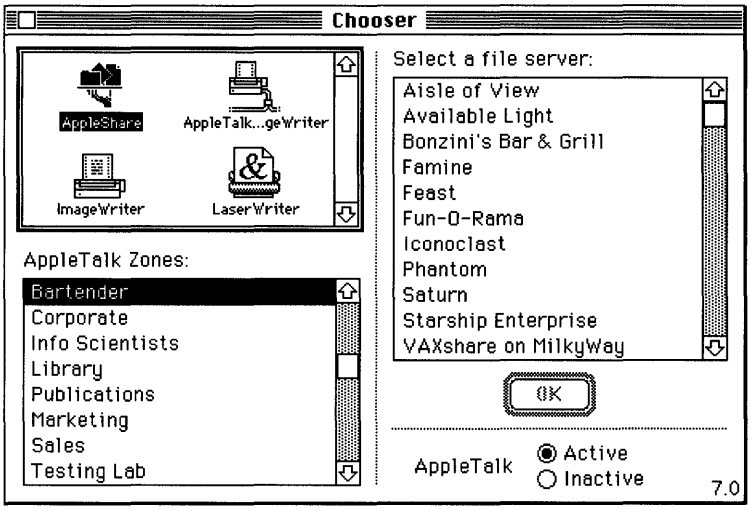
The Chooser window appears.



b. Make sure that your Macintosh is physically connected to the network, and select the Active option for AppleTalk, in the lower-right corner of the window.

c. Click the AppleShare icon in the group of icons in the upper-left corner of the Chooser window.

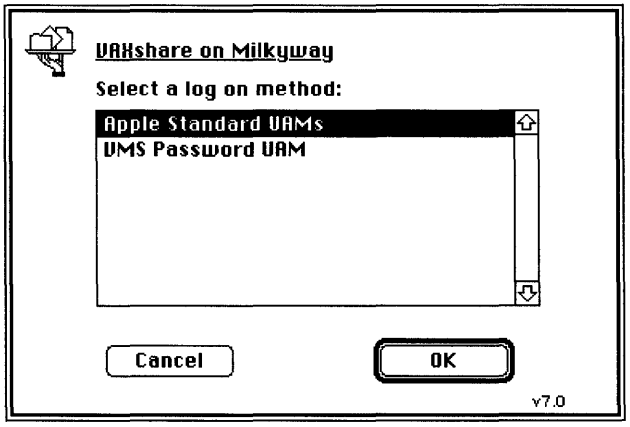
The Chooser searches for VAXshare as well as AppleShare file servers, and displays a list of available servers in the upper-right corner of the Chooser window.



d. If your network is divided into zones, select the zone that has the file server you want to use. The list of available zones appears in the lower-left corner of the window.

e. Select the file server that you want to use and click the OK button.

If you've installed VMS UAM, a dialog box appears to let you select a log-on method.

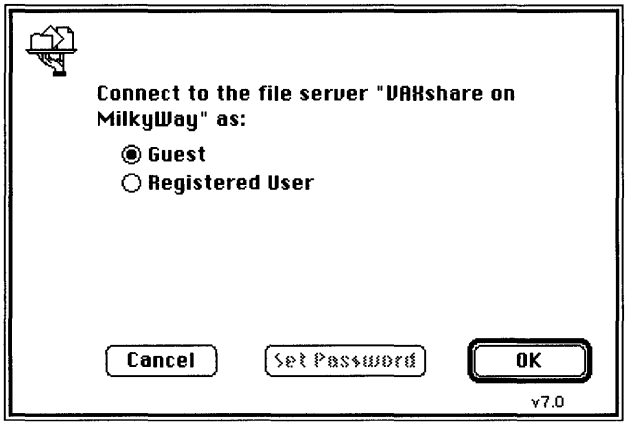


2 **Leave the log-on method set at Apple Standard UAMs and click the OK button.**

Apple Standard allows you to have server volumes appear on your desktop automatically at startup time. The steps for specifying startup volumes are given later in this section.

Do not select VMS Password UAM because this method does not allow you to log on as a guest.

A dialog box appears that allows you to identify yourself and to choose whether to log on as a registered user or as a guest. (If the dialog box does not appear, contact your system administrator, who may have disabled this option.)



◆ **Note** If the Guest radio button is dimmed, you cannot log on as a guest. The system administrator can disable the guest log-on feature. ◆

3 Connect to the server.

Select Guest, and click the OK button.

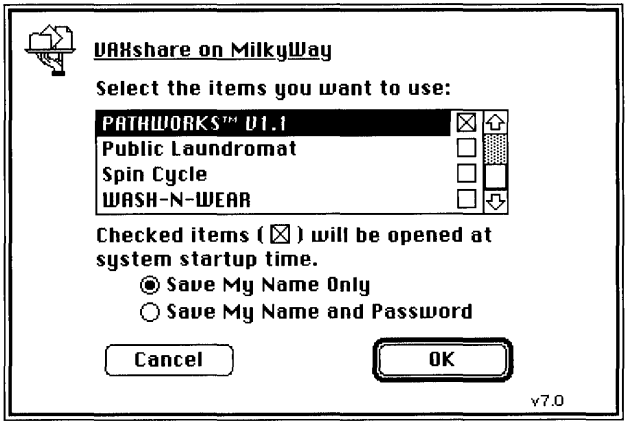
A dialog box appears, listing the server volumes available on the file server that you selected.

4 If you want to, select one or more volumes and select a startup option.

a. Scroll through the list, if necessary, to find the volumes that you want. You select a single volume by clicking its name. You can select two or more names by Shift-clicking (that is, by holding down the Shift key while you click each volume name).

   If a volume name is dimmed, either that volume already appears on your desktop or you do not have access privileges for that volume.

b. If your log-on method is Apple Standard, you can specify volumes to appear on your desktop automatically whenever you start your computer. Check the box (to the right of the volume name) for each volume that you want to appear.

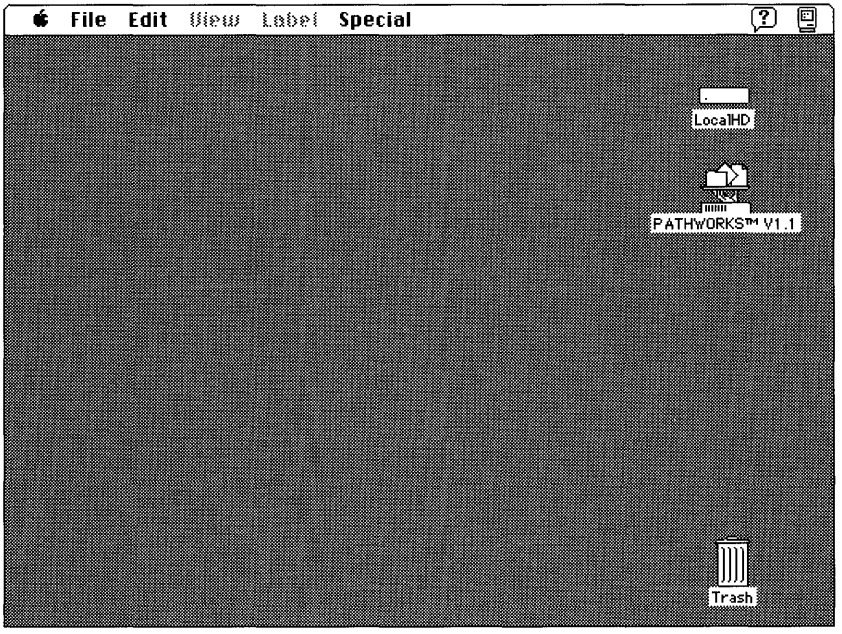


c. Enter the volume password if you are prompted to do so.

Ask your system administrator for the password if you don't know it.

5 Click the OK button and close the Chooser window.

The icon for each volume that you selected appears on your desktop. Note that the icon for a VAXshare file server looks different from the icon for an AppleShare file server.



Selecting a network connection

Your Macintosh computer may be connected to more than one network, or you may have two or more connections to the same network. For example, your computer may be connected to a LocalTalk network and also contain an Ethernet card that connects it directly to an Ethernet environment. Or it may contain multiple Ethernet cards, each card connecting it to a different Ethernet environment. If you have multiple network connections, you must specify which connection you want to use.

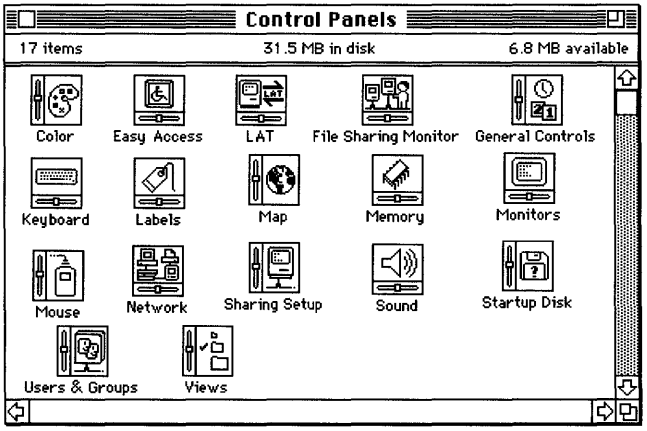
The process of selecting a network connection differs somewhat for Macintosh computers running version 7.0 and those running version 6.0.*x*. The following sections include procedures for each environment.

Selecting a network connection in version 7.0

To select a network connection on a Macintosh computer running version 7.0:

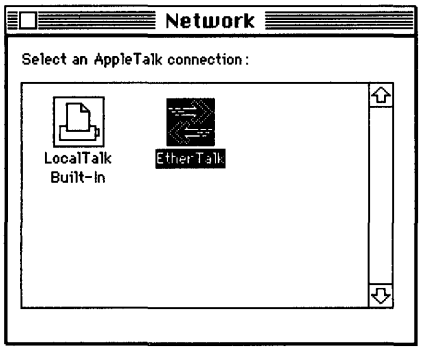
1 **Choose Control Panels from the Apple (🍎) menu.**

The Control Panels window appears. Each control panel has its own icon and can be opened like the icon for a program or a document.



2 **Double-click the Network control panel icon.**

The Network panel appears.



3 **Select the icon for the network connection that you want to use.**

The Network panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label LocalTalk Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh computer is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the Network panel.**

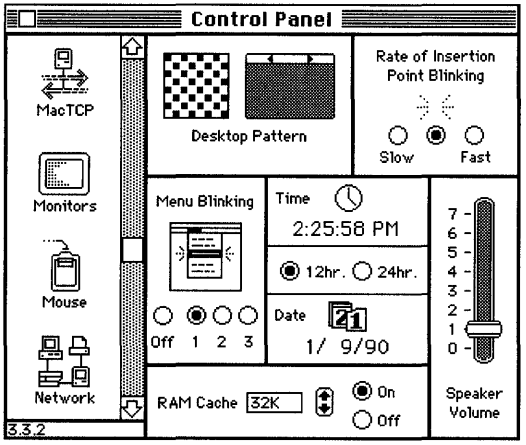
5 **Close the Control Panels window.**

Selecting a network connection in version 6.0.x

To select a network connection on a Macintosh computer running version 6.0.*x*:

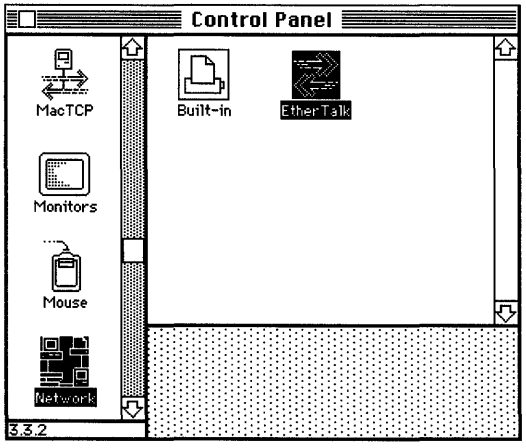
1 **Choose Control Panel from the Apple (🍎) menu.**

The Control Panel dialog box appears.



2 **Select the Network icon from the group of icons on the left side of the Control Panel dialog box.**

You may have to scroll through the list to find the Network icon.



3 **Select the icon for the network connection that you want to use.**

The Control Panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the Control Panel dialog box.**

Macintosh and VMS filenames

When you save a file on a VAXshare file-server volume, the filename that you used on your Macintosh computer is mapped to a filename allowed by the VMS operating system. (VMS filenames cannot contain certain characters allowed in Macintosh filenames.) When you access the VAXshare file server from your Macintosh, you still see the Macintosh filename, but if you look at a VMS directory, you will see the VMS filename to which the original filename was mapped.

The VMS operating system substitutes the underscore character (_) for characters in the Macintosh filename that are not allowed. This means that different Macintosh filenames could map to the same VMS filename. For example, My&File, My@File, My_File, and My File all map to the VMS filename My_File.

If the Macintosh filename maps to a VMS filename that is already "taken," an error message will appear to let you know that you must save the file under a different name on the VAXshare volume. That is, your filename may map to the same VMS filename to which another filename has mapped. In this case, the following error message appears:

```
The file "My&File" couldn't be copied and was skipped. (An
item with that name already exists.)
```

Try again, using, for example, the name My&Own&File.

Access privileges

A computer network allows communication between different computers and between the people who use them. An important part of the communication process is the ability to share files. It is seldom the case, however, that you want all people to have access to all files. In a shared information environment, privacy is as important as the ability to share files.

VAXshare gives you privacy by letting you specify access privileges for VAXshare folders. You can make the contents of a folder available to all network users, available to only a certain group of users, or completely private.

You can also determine how others will be able to use the contents of a folder to which you give them access. There are three categories of access:

- **See Folders**—allows users to see only other folders within your folder.
- **See Files**—lets users see not only other folders but also files (documents and programs) within your folder. Users can also open and copy files from the folder.
- **Make Changes**—lets users make changes to the contents of your folder. Users can add to, move, and delete the contents of these folders.

For each of the access categories, there are three types of VAXshare users to whom you can grant access:

- **Owner**—the creator of the folder
- **User/Group**—a set of users defined by the system administrator
- **Everyone**—every user with access to the server, including guests

When you set access privileges for a folder, you specify the categories of access for each type of user. The next section tells you how.

Setting access privileges in version 7.0

In system software version 7.0, you set access privileges for folders on file-server volumes with the Sharing command in the File menu.

To set access privileges for folders on a file-server volume:

1 **Log on to a VAXshare file server and mount a file-server volume, as described earlier in this chapter. You should see the icon for the volume on your screen.**

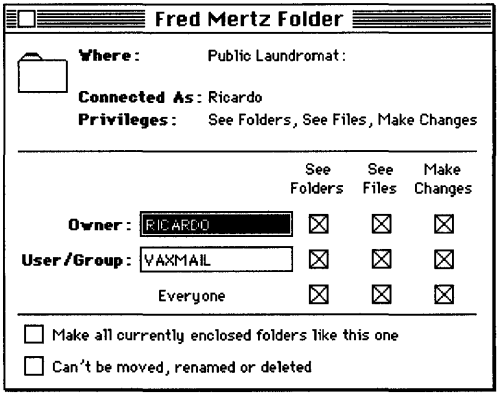
2 **Open the file-server volume.**

Double-click the server volume icon.

3 **Select the folder for which you want access privileges set.**

4 **Choose Sharing from the File menu.**

The Sharing dialog box appears.



5 **If you have VMS privileges, you can change the owner of the folder by entering the name of another registered user in the Owner text field. Once you do so, you have given the folder away, and you cannot get it back.**

6 Check the appropriate access privileges boxes.

The following table shows the minimum types of privileges needed for Folder A before a user can do each of the frequently used operations that are listed.

Action	See Folders	See Files	Make Changes
Copy or move to Folder A	☐	☐	☒
Copy a file from Folder A	☐	☒	☐
Copy a folder from Folder A	☒	☐	☐
Create a folder in Folder A	☒	☐	☒
Delete a file from Folder A	☐	☒	☒
Delete a folder from Folder A	☒	☐	☒
Open and use a file in Folder A	☐	☒	☐
Save changes to a file in Folder A	☐	☒	☒

7 Check the other boxes in the Sharing dialog box, if appropriate.

When you check the box labeled "Make all enclosed folders like this one," you set the privileges of all folders inside this folder. This may be useful if you have set privileges to some of these folders, and you now want them to to be consistent with the current folder.

The box labeled "Can't be moved, renamed or deleted" prevents anyone on the network, including you, from moving, deleting, or renaming this folder.

8 Close the Sharing dialog box.

Setting access privileges in version 6.0.*x*

In version 6.0.*x*, you can set access privileges for folders on the volume with either of two different menu commands. The procedure is slightly different for each command.

- The Access Privileges command, in the Apple (🍎) menu, is a desk accessory that you can use when you are working in the Finder™ system software. (This command is also known as the Access Privileges desk accessory.) You choose the Access Privileges command and then select a folder for which you want to set privileges. After you define the privileges for the folder, you can go on to set the privileges for another folder by clicking a button in the Access Privileges dialog box. In this way, you can set privileges for as many folders as you like.
- The Get Privileges command can be used whether you are using MultiFinder® system software or you are in the Finder. (If you are using MultiFinder, you must use this command, even if you switch to the Finder; you cannot use the Access Privileges command.) The Get Privileges command is in the File menu that appears when the Finder is active, so if you are using MultiFinder, you must switch to the Finder to use this command. Before you use Get Privileges, you must select a folder on the desktop. Then you choose the Get Privileges command from the menu. You can select two or more folders by Shift-clicking. An Access Privileges dialog box appears on the screen for each folder that you select.

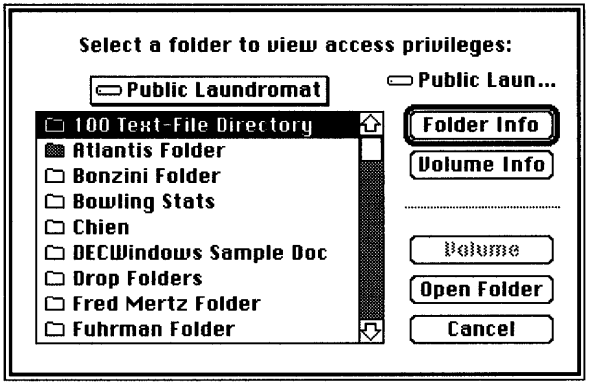
Using the Access Privileges command

To set access privileges for a folder with the Access Privileges command:

1 **Log on to a VAXshare file server and mount a file-server volume, as described earlier in this chapter. You should see the icon for the volume on your screen.**

2 **Choose Access Privileges from the Apple menu.**

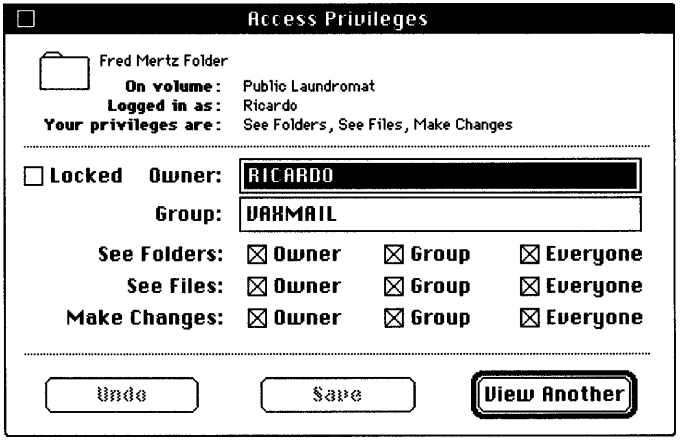
A dialog box appears, showing the contents of the file-server volume.



3 **Select the name of the folder for which you want to set access privileges. (You may need to scroll through the list to see the folder name.) Then click the Folder Info button.**

If the folder that you want is inside other folders, you'll need to open each of those folders first.

The Access Privileges dialog box appears.



4 **If you have VMS privileges, you can change the owner of the folder by entering the name of another registered user in the Owner text field. Once you do so, you have given the folder away, and you cannot get it back.**

If you click the Locked option, then the folder cannot be placed in the Trash, although individual items inside the folder can be thrown away.

5 **Click the appropriate access privileges boxes, and then click the Save button.**

If you've made a mistake, you can cancel your changes by clicking the Undo button. Click the View Another button to set access privileges for another folder on the file server.

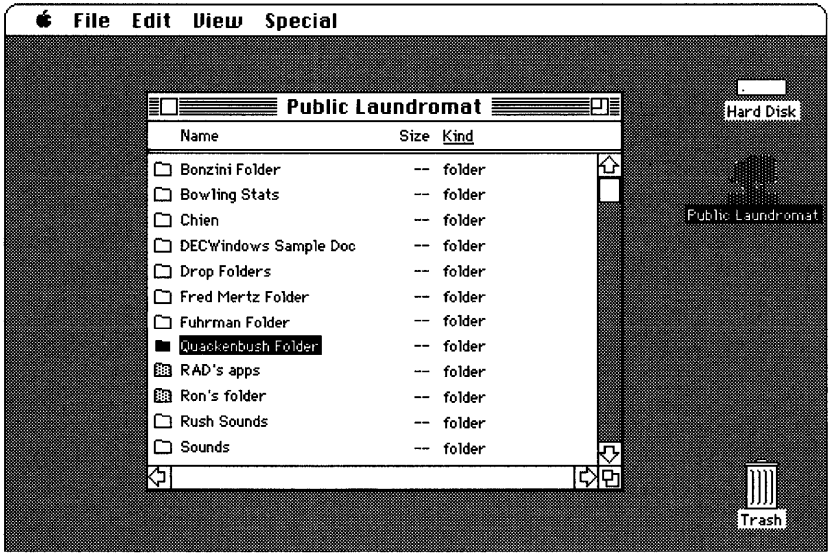
Using the Get Privileges command

To set access privileges for a folder with the Get Privileges command:

1 **Log on to a VAXshare file server and mount a file-server volume, as described earlier in this chapter. When the icon representing the file-server volume appears on the right side of the screen, double-click the icon.**

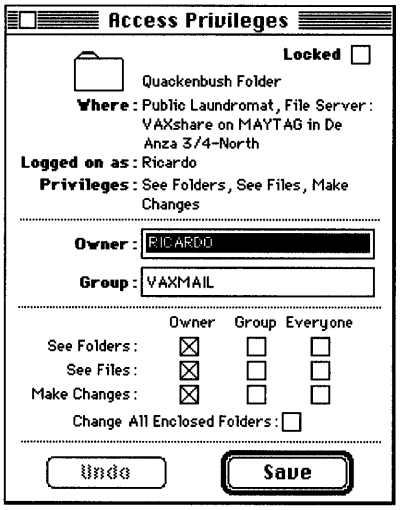
A window opens, displaying the volume's contents.

2 **From the desktop, select the folder whose access privileges you want to change.**



3 **Choose Get Privileges from the File menu.**

The Access Privileges dialog box appears.



4 **If you have VMS privileges, you can change the owner of the folder by entering the name of another registered user in the Owner text field. Once you do so, you have given the folder away, and you cannot get it back.**

If you click the Locked option, then the folder cannot be placed in the Trash, although individual items inside the folder can be thrown away.

5 **Click the appropriate access privileges boxes.**

6 **If you want to make the same changes for all folders (to which you have access) in the folder that you're changing, click the Change All Enclosed Folders box.**

7 **Click the Save button and close the window.**

If you've made a mistake, you can cancel your changes by clicking the Undo button before you close the window.

Differences between VAXshare and AppleShare file servers

This section describes some differences to keep in mind when you work with documents on a VAXshare file server. It also describes how the procedure for logging on to a VAXshare file server is different from that for logging on to an AppleShare file server. (This section does not tell you how to log on to VAXshare. For step-by-step instructions, see "Logging On and Mounting Volumes as a Registered User" or "Logging On and Mounting Volumes as a Guest," earlier in this chapter.)

Working with documents on a VAXshare file server

VAXshare is designed to be as much like AppleShare as possible. However, because VAXshare exists on VAX computers—in an environment very different from that of Macintosh computers—there are some special considerations:

- Display of changes to file-server volumes operates differently.
- You can have multiple versions of a file on a VAX.
- VMS places limits on the level to which you can nest folders.
- VMS files may appear on file-server volumes. Some VMS files can be opened from Macintosh programs.

The sections that follow explain each of these considerations in more detail.

Display of changes to file-server volumes

The windows that display changes to VAXshare file-server volumes operate differently than those that show changes to AppleShare volumes. When you open an AppleShare file-server volume, the window displaying the contents of the volume is updated every minute or so, so that you are automatically informed of changes that other users make to the volume. For example, if another user adds a file to the volume, you will see the addition almost immediately.

When a VAXshare file-server volume is open, however, there is no automatic update to notify you of changes made by network users who are not using Macintosh computers. The window that displays the volume contents is automatically updated only when changes are made by other Macintosh users. To see changes that other users have made to the volume while you were using it, you must close the window and then reopen it.

Multiple file versions

Unlike the Macintosh Operating System, the VMS operating system allows you to have multiple versions of the same file. When you save a file on a Macintosh computer, the saved version of the file replaces the previous version that was on your disk. When you save a file under VMS, the previous version of the file is not replaced—instead, VMS saves the new version with an incremented version number.

For example, you could create a new file and name it SilvioMemo. VMS assigns version number 1 to the file, so the filename on the VAX is SilvioMemo;1. If you make changes to the file and save it again, a new file, SilvioMemo;2, is created. If you make changes to SilvioMemo;1 or SilvioMemo;2, the new version becomes SilvioMemo;3. Unless you delete one or more versions of the file, all of the versions remain available.

VAXshare can display only a single version of a VMS file. When multiple versions of a VMS file exist on a VAXshare file server, VAXshare allows you to see only the most recent version of the VMS file from your Macintosh—the one with the highest version number.

Some operations that you perform on your Macintosh, however, affect *all* versions of a VMS file:

- Rename
- Move
- Delete

If you rename, move, or delete a VMS file on a VAXshare file server, all versions of the file are similarly affected. For example, if you rename SilvioMemo to SilvioReport, all versions of SilvioMemo become SilvioReport. If you move SilvioMemo to a different directory, all versions of the file move to that directory. If you delete SilvioMemo, all versions of that file are deleted. (To delete just one version of a file, you must log in to VMS.)

VMS directories

As explained earlier in this chapter, VAXshare maps VMS directories and files to Macintosh folders and files. Although the folders that you see on VAXshare are actually directories on the VMS system, you can create and use the folders just as you would on any AppleShare file server.

◆ **Note** The VAXshare system administrator can limit the number of levels to which you can nest folders on a file server. Often the limit is 7 levels; however, in some instances, it may be as many as 16. ◆

Using VMS files

When you mount a VAXshare file-server volume, the VMS files on the volume are shown along with the Macintosh files. Some of these VMS files can be opened directly from Macintosh application programs. Others need to be converted to Macintosh formats before you can open them. You convert files by using the `CONVERT/DOCUMENT` DCL command. Still other VMS files cannot be used from your Macintosh at all. Icons are used to indicate the different types of VMS files so that you can see the files on your Macintosh desktop.

As a part of making VMS files accessible to Macintosh users, PATHWORKS for Macintosh assigns **type** and **creator** codes to the VMS files, in addition to the icons for the files that appear on your Macintosh screen. Type and creator codes help the Macintosh Operating System identify different kinds of files and determine which documents can be opened by a particular Macintosh program. For example, VMS text files can be opened by the TeachText program because PATHWORKS for Macintosh assigns the `ttxt` creator code and `TEXT` type code to the text file when it is located in a VMS directory that serves as a VAXshare volume.

VMS files that can be opened directly by Macintosh programs look and behave like normal Macintosh documents. From the VAXShare file server on your Macintosh desktop, these files are indistinguishable from documents created by Macintosh programs, such as documents created with the following programs:

Microsoft Excel	MacPaint®
Adobe Illustrator	MacWrite®
MacDraw®	PageMaker

Table 2-1 gives a complete list of the types of VMS files that appear on VAXshare file-server volumes as Macintosh program documents.

Table 2-1 VMS files as they appear on VAXshare file-server volumes

VMS file type	Appears as	Creator code	Type code
.ADB	Adobe Illustrator document[1]	EPSP	ARTZ
.DOC[2]	Microsoft Word 4.0 document	MSWD	WDBN
.MACPAINT	MacPaint document	MPNT	PNTG
.MACWRITE	MacWrite® document	MACA	WORD
.PICT	PICT document	MDRW	PICT
.PM3	PageMaker 3.0 document[1]	ALD3	ALB3
.PM4	PageMaker 4.0 document[1]	ALD4	ALB4
.PUB	PageMaker 2.0 document[1]	ALD2	ALB2
.SK	Microsoft Excel text document	XCEL	TEXT
.SLK	Microsoft Excel text document	XCEL	TEXT
.SYL	Microsoft Excel text document	XCEL	TEXT
.SYLK	Microsoft Excel text document	XCEL	TEXT
.TIF	TIFF document	????	TIFF
.TXT	TeachText document	ttxt	TEXT[3]
.WK1	Microsoft Excel text document	XCEL	TEXT
.WKS	Microsoft Excel text document	XCEL	TEXT
.WP	WordPerfect document[1]	SSIW	WPD
.WPF	WordPerfect document[1]	SSIW	WPDC

[1] File appears with the specific Macintosh program document icon only if a file of that type of program has been previously saved on the VAXshare file-server volume; otherwise, the file appears with the generic document icon.

[2] A .DOC file appears as a Microsoft Word 4.0 document only if the file has fixed-length-record file format; otherwise, it usually appears as a TeachText document.

[3] In addition to files with .TXT extensions, the following types of files appear as TeachText documents:

- all normal VMS text files (variable-length records with implied carriage control)
- print format files (such as DCL log files)
- all types of stream files

VMS files that are *not* converted to standard Macintosh documents are given special icons. The following list shows these icons and describes the type of file that each represents. These files may or may not be accessible from Macintosh programs.

◆ **Note** The type and creator codes given in the following list are the *default* codes used by PATHWORKS for Macintosh. Your system administrator can change the code assignments, so that the type and creator codes for the VMS files on your VAXshare file server may differ from those shown here. Such changes may affect which Macintosh programs can use the VMS files. ◆

MacBinary file
Type code: MBIN
Creator code: DECM

The MacBinary file format makes it possible to store Macintosh files on a computer system other than a Macintosh computer. You cannot use MacBinary files directly on your Macintosh. You can convert a MacBinary file that resides on a VAXshare file server to a Macintosh file by using a MacBinary converter. (A MacBinary converter called mBin is supplied with PATHWORKS for Macintosh. It is a sample program contained in the Examples folder.) You can also transfer MacBinary files to your Macintosh by using a MacBinary file-transfer operation. A MacBinary file transfer automatically converts the file to a usable form.

Generic VMS file
Type code: ????
Creator code: MSAF

This is an unidentified VMS file. If you know the contents and format of the file, you may be able to open the document from a compatible Macintosh program.

VMS command procedure (.COM) file
Type code: TEXT
Creator code: VMSS

A VMS command procedure file contains a list of DCL commands. From the VMS operating system, you can execute a command procedure file by typing the file's name and pressing Return. When you execute a command procedure, the VMS operating system reads and executes the commands in the file. You can open VMS command procedure files from word processing and text-editing programs that run on Macintosh computers.

To execute a command procedure file from a terminal emulator logged into VMS, you must type an "at" sign (@) before the filename. For example, the command

```
@LOGIN
```

executes the user's LOGIN.COM file.

VMS executable (.EXE) file
Type code: EXE
Creator code: VMSS

A VMS executable file contains instructions and data in machine-readable format—in other words, a VMS program. You cannot view the contents of an executable file from either your Macintosh or the VMS operating system. From the VMS operating system, you run a VMS program by typing the RUN command, followed by the name of the executable file (and pressing Return).

VMS object (.OBJ) file
Type code: OBJ
Creator code: VMSS

A VMS object file is a file created by a language compiler or assembler. Macintosh users cannot use VMS object files; these files are used for building VMS programs.

VMS object library (.OLB) file
Type code: OLB
Creator code: VMSS

A VMS object library file is used in VMS programming. It contains one or more object modules (routines) used by the VMS Linker. Macintosh users cannot use VMS object library files.

CDA-DDIF document file
Type code: DDIF
Creator code: CDAD

A Digital Document Interchange Format (DDIF™) file is one type of CDA™ document. DDIF documents can contain text, graphics, page layout, and other types of information. DDIF documents can be used by many programs that run on VAX computers. You can convert a DDIF file to a Macintosh-compatible format by using the CONVERT/DOCUMENT DCL command.

CDA-DTIF document file
Type code: DTIF
Creator code: CDAD

A Digital Table Interchange Format (DTIF™) file is a CDA document that can contain revisable data tables, formulas, and spreadsheets. You can convert a DTIF file to a Macintosh-compatible format by using the CONVERT/DOCUMENT DCL command.

DOTS file
Type code: DOTS
Creator code: CDAD

A Data Object Transport Syntax (DOTS) file contains one or more compressed CDA documents. A DOTS file allows multiple files to be transferred together. For example, DECwindows Mail uses the DOTS format to combine and transfer a group of linked spreadsheet files.

Incompatible file
Type code: NOGO
Creator code: MSAF

This icon indicates a VMS file that cannot be used by Macintosh programs, such as a DOS or VMS system file.

The system administrator can disable the capability to see VMS files when you log on to a file server. Your system administrator can also change the type and creator code assignments. If you expect to see VMS files listed and none appear, check with your system administrator. (Because VMS filenames with more than 31 characters do not appear in a VAXshare file-server volume, the problem may be that the VMS filenames are too long.)

What's different about logging on to VAXshare

This section describes steps in the log-on process that are specific to VAXshare and shows the dialog boxes that appear when you perform those steps. For step-by-step instructions for logging on, see "Logging On and Mounting Volumes as a Registered User" or "Logging On and Mounting Volumes as a Guest," earlier in this chapter.

Alternative log-on method

If you have installed the alternative log-on method, called *VMS UAM,* the dialog box in Figure 2-2 appears during the log-on process to let you select the method that you want to use.

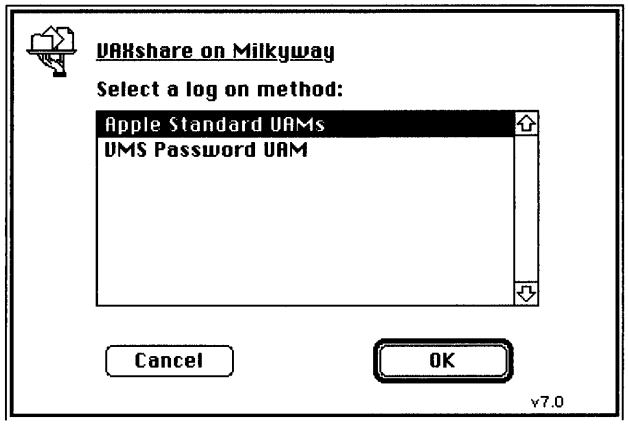


Figure 2-2 Choosing a log-on method

Figure 2-3 shows the dialog box that appears after you select the log-on method.

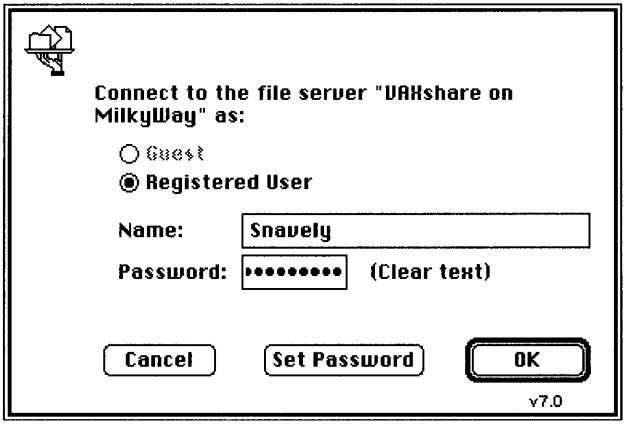


Figure 2-3 The Apple Standard log-on method dialog box

Volume password

You may need to enter a password in order to log on to a particular volume. Figure 2-4 shows the dialog box that prompts you for a volume password.

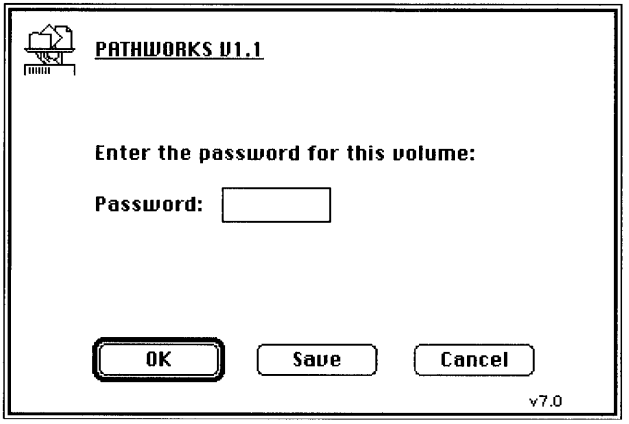


Figure 2-4 Entering a volume password

VAXshare file-server icon

Note that the icon for a VAXshare file server looks different from the icon for an AppleShare file server, as shown in Figure 2-5.

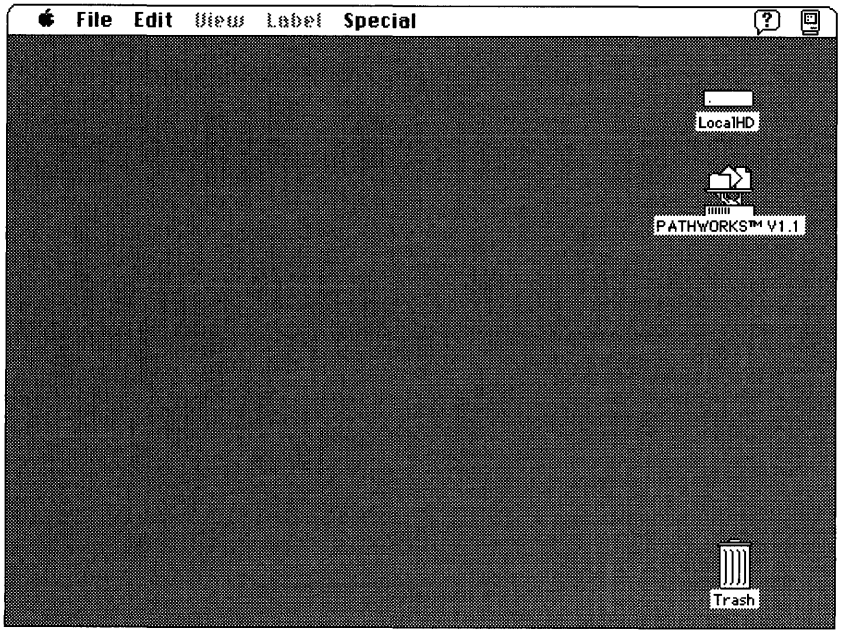


Figure 2-5 VAXshare file-server icon on the desktop

Logging off VAXshare

To log off a VAXshare file server, drag the icons of the server volumes on your desktop to the Trash, or shut down your Macintosh.

Troubleshooting

The following sections provide troubleshooting information for logging on to a VAXshare file server and network-related problems.

Problems logging on

If you have trouble logging on to a VAXshare file server, check for the following conditions:

You may have entered your user name or password incorrectly.

Try again specifying the correct user name and password.

Your password may have expired.

See your system administrator. The system administrator may have assigned a time limit for each password that you set—for example, 90 days—so that you must change your password at least that often. If you don't change your password within that period, your password will expire.

The number of users currently logged in to the file server may have reached the limit set by the system administrator.

There is a limit to the number of users allowed to log in to the file server at one time. Try again later.

The number of users currently logged on to VAXshare may have reached the limit set by the system administrator.

Try again later.

Your account may not allow you to log in at the current time.

Your system administrator may restrict your access at certain times. See your system administrator.

If you have trouble finding a VMS file on a VAXshare file server, check for the following conditions:

The filename may be too long.

VMS files with names longer than 31 characters (which is the limit for Macintosh filenames) are not visible on VAXshare file servers. Log in to the VMS operating system and give the file that you're trying to open a new name shorter than 31 characters.

The system administrator may have disabled the capability to see certain VMS files on VAXshare file-server volumes.

See your system administrator.

Network-related problems in version 7.0

The following conditions may occur if your Macintosh computer is running version 7.0. If one of the scenarios in the list describes a problem that you're having, it could be related to the network hardware or software that you're using.

The Network panel is missing from the Control Panels folder.

In this case, one of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The Network panel has been moved from the Control Panels folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You can't select the Network panel in the Control Panels folder. A message appears, advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear after you open the Network panel.

One of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from the Extensions folder in your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- There is no Ethernet card in your Macintosh computer, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear when you open the Network panel.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.
- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the Extensions folder in your System Folder and drag it to the Trash.

You can't select the EtherTalk icon in the Network panel. You get a message advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh with an EtherTalk startup disk or the disk that you used is damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Network panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all programs and try switching the network connection again. If you still can't switch network connections and you don't mind disrupting services that your computer provides or is using, shut down your computer. Then restart, using a startup disk that permits network-connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start your computer. The computer can hang if it is not correctly connected to the Ethernet cable or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

Network-related problems in version 6.0.*x*

The following conditions may occur if your Macintosh computer is running version 6.0.*x*. If one of the scenarios in the list describes a problem that you're having, it could be related to the network hardware or software that you're using.

The Control Panel is missing.

The Control Panel is present on all startup disks unless you have removed it with the Font/DA Mover. If you're using more than one startup disk, your Macintosh may switch to a disk without the Control Panel installed. The icon of the current startup disk is in the upper-right corner of the desktop.

Use the Installer program from the *System Tools* disk (version 6.0.4 or later) to update your System file. The Installer automatically reinstalls the Control Panel.

The Network icon is missing from the Control Panel.

In this case, one of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.

- The Network icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or later. (The version number appears in the lower-left corner of the Control Panel). Use the Installer program from the *System Tools* disk (version 6.0.4 or later) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the Network icon in the Control Panel. A message appears, advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear in the Control Panel after you click the Network icon.

One of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- There is no Ethernet card in your Macintosh computer, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear in the Control Panel when you click the Network icon.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.

- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the System Folder and drag it to the trash.

You can't select the EtherTalk icon in the Control Panel. A message appears advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh computer with an EtherTalk startup disk or the disk that you used is damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Control Panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all application programs and try switching the network connection again. If you still can't switch network connections and you don't mind disrupting services that your computer provides or is using, shut down your Macintosh. Then restart, using a startup disk that permits network-connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start your computer. The computer can hang if it is not correctly connected to the Ethernet cable or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

Ethernet troubleshooting checklist

Here's a checklist to consult whenever you're having trouble with Ethernet:

- Are all cables secure?

  Make sure that the network cable to your Ethernet card is secure at all connections. Also check the network cable to the service that you're trying to use. Contact your system administrator if you are uncertain about cable configuration.

- Is the problem really related to the network?

  Sometimes a problem that seems to be related to the network is actually related to the device or application program that you're using. The manual for the device or program may be helpful.

- Is your Ethernet card installed and set correctly?

  Shut down your Macintosh computer and make sure that the Ethernet card is firmly seated in its slot. Also, make sure that any jumpers and switches are set properly. See the documentation for your Ethernet card.

- Is the application that you want to use available on your network?

  If there is more than one network to which you can connect, you need to select the proper network connection. For instructions, see "Selecting a Network Connection," earlier in this module.

3 VAXshare Print Services

A VAXshare print server manages the task of printing documents on printers attached to your network. When you let a print server manage the printing of your documents, you can save valuable processing time on your Macintosh computer. VAXshare print servers also give you access to Digital PostScript printers attached to your network.

This chapter tells you how to select a VAXshare print server. It also gives troubleshooting hints that may help if you have trouble printing with the print server.

If you are already familiar with AppleShare print servers, you may want to read just the section "VMS Print Queues."

Overview of VAXshare print servers

In order to print a document, you need to specify a printer or print server. Using a server allows you to regain control of your Macintosh computer more quickly than sending the document directly to a printer. If you send the document to a printer, you must wait until the document is printed before you can continue using your Macintosh computer. If others are already using the printer, you must wait until their documents are printed before yours starts to print. However, if you send the document to a server, you regain use of your Macintosh as soon as the server has "captured" the print file.

VAXshare print servers work very much like **AppleShare print servers,** with which you may already be familiar. When you send a document to a VAXshare print server, VAXshare receives the file's contents and print instructions from your Macintosh program and saves a print file on the disk. VAXshare then returns printer codes to your program to signal that printing has been completed. It appears to your program that the document has been printed, and you are free to do other tasks on your Macintosh while VAXshare manages the printing process.

You can use VAXshare print servers to access both Digital and Apple PostScript printers attached to your network. Digital printers that can be accessed through VAXshare include

- DEClaser 1150
- DEClaser 2150
- DEClaser 2250
- LN03 Image Printer
- LN03R ScriptPrinter™
- PrintServer™ 20 (LPS20)
- PrintServer 20 Turbo (LPS20 Turbo)
- PrintServer 40 (LPS40)
- PrintServer 40 Plus (LPS40 Plus)

Although you can print directly to Apple LaserWriter® printers as well as use them through a print server, Digital printers are available only through print servers.

◆ **Note** VAXshare print servers also let VMS, DOS, and OS/2 users access LaserWriter printers. ◆

The terms *print server* and *print spooler* usually mean the same thing—an application program that manages printing on a network printer. For the sake of clarity, the term *print server* is used in this guide to mean the combined hardware and software that manage printing on network printers. **Print spooler,** in this guide, refers to that part of the print server software that manages printing on a particular printer or paper tray. Because the VAXshare print server software can manage printing on several printers or paper trays, using a VAXshare print server is like using several print spoolers.

◆ **Note** If you are using MultiFinder (in version 6.0.*x*, you also have the option of working in the Finder), don't confuse using a print server with background printing. Background printing is a process that takes place on your Macintosh computer. By using the time when the Macintosh is idle to send documents to a printer, background printing manages a printing task without interrupting your work, but it may slow your computer's performance. Using a print server, on the other hand, frees you to go on to other tasks by having the print server take over the task of sending documents to network printers. In addition, print servers give you features not provided by background printing. For example, they allow you to continue spooling documents even when a printer is out of paper and to shut down your computer once your document is sent to the server. ◆

Figure 3-1 shows the software and hardware components involved in using a VAXshare print server. Note that the software components can be found in the folders indicated in this figure only if the Macintosh is running system software version 7.0. To find out where these components are installed in a version 6.0.*x* environment, see the section "Where the Software Is Located" in the *Installation* part of this binder.

◆ **Note** If the symbols and terminology shown in Figure 3-1 are unfamiliar to you, you may want to read Appendix A, which discusses network terms and concepts. ◆

PATHWORKS for Macintosh includes a set of Digital Command Language (DCL) commands that you can use to get information about VAXshare print servers. For more information on these commands, see Appendix B.

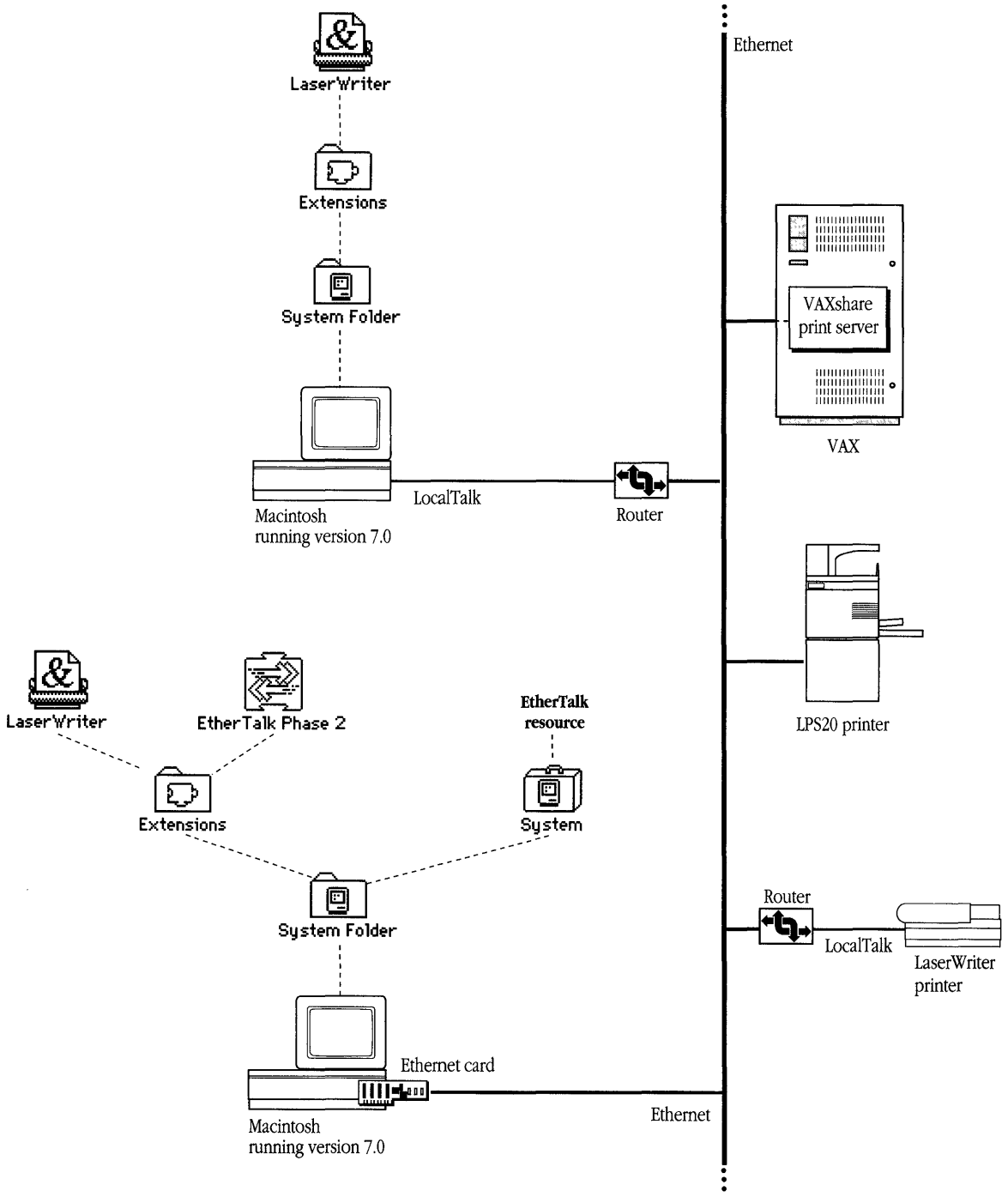


Figure 3-1 Network components for VAXshare print services

Selecting a print server

Choosing to print by way of a print server is the same procedure as choosing to print directly to a printer. This section focuses on print servers, but the dialog boxes that appear list printers as well as servers.

When you select the LaserWriter icon in the Chooser window, the Chooser presents a list of printers and print servers available on your network. You can then select the name of the server that you want to use.

Note that the system administrator assigns names that differentiate printers from servers. Typically, the name of a print server includes the word *server* or *spooler*—for example, "Letterhead Spooler"—or the phrase *on <node name>* or *at <node name>*—for example, "Letterhead on Java." The name of a printer usually does not include *server* or *spooler*.

Figure 3-2 shows the Chooser window with names for both printers and print servers.

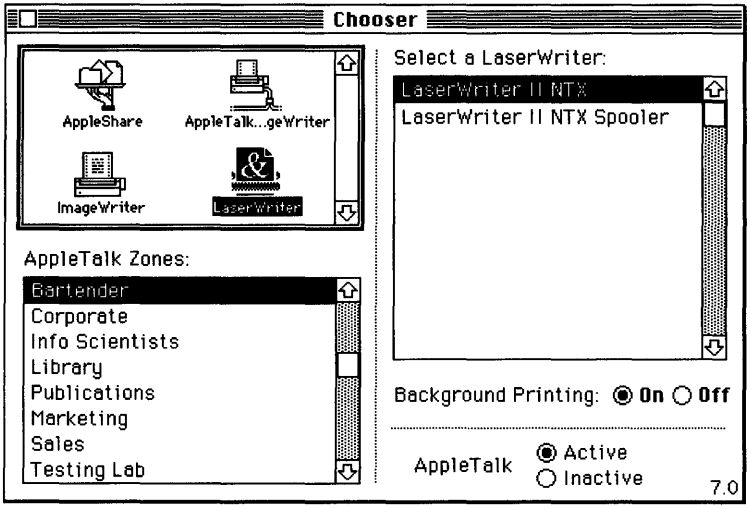


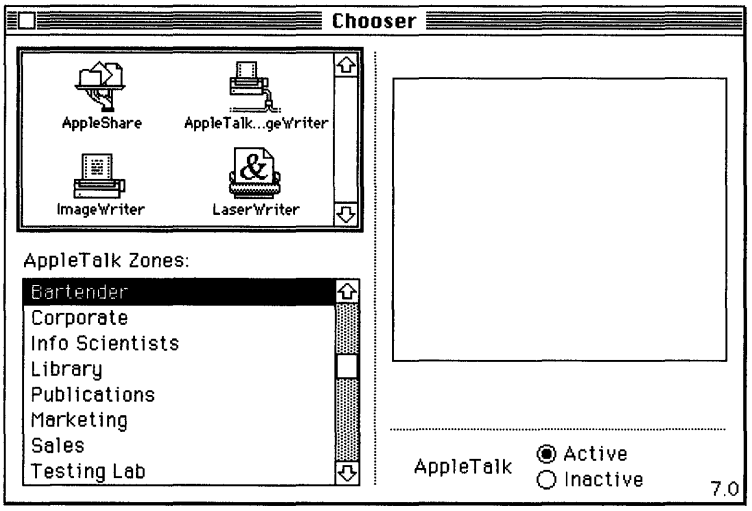
Figure 3-2 The Chooser showing a list of printers and print servers

Note that if your Macintosh computer is connected to more than one network, you need to follow the steps given in "Selecting a Network Connection," later in this chapter, before you can select a server.

To select a server:

1 **Open the Chooser from the Apple (🍎) menu.**

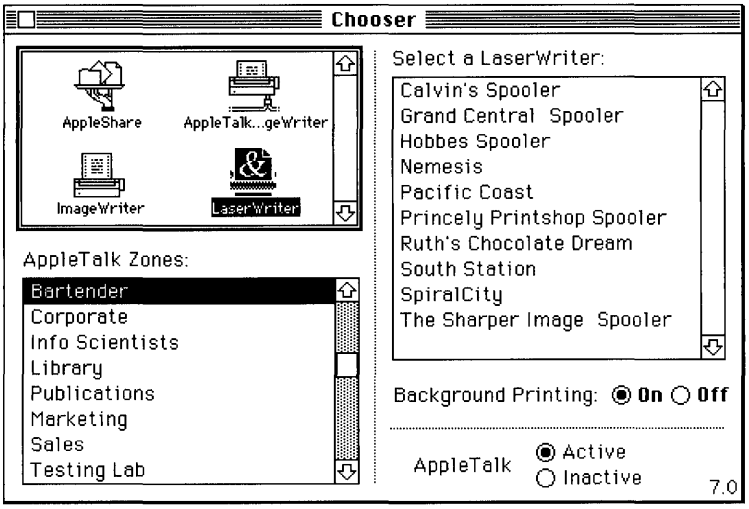
The Chooser window appears.



2 **Make sure that your Macintosh is physically connected to the network, and select the Active option for AppleTalk, in the lower-right corner of the window.**

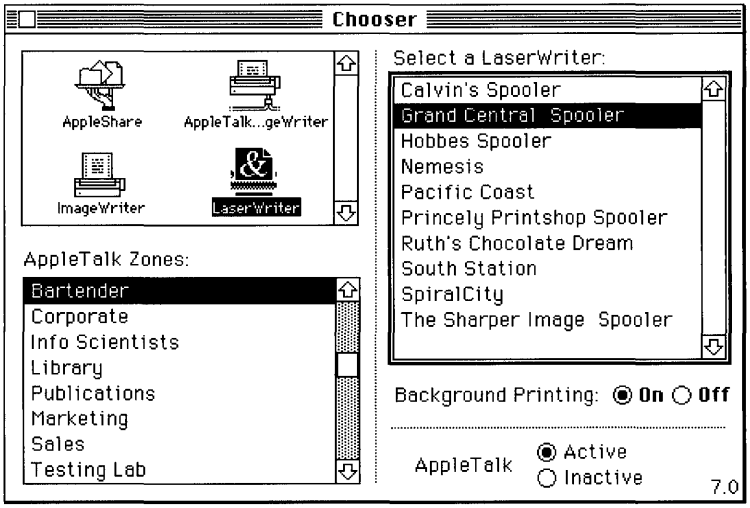
3 **If your network is divided into zones, the available zones are listed in the lower-left corner of the window. Select the zone containing the print server that you want to use.**

4 **Select the LaserWriter icon from the group of icons on the left side of the Chooser window.**



The Chooser searches the network for all PostScript printers and servers in the selected zone, and displays a list of printers and servers for that zone in the upper-right corner of the Chooser window.

5 Select a server.



6 Close the Chooser window.

Changing your server selection

You can change your selection of server at any time by repeating the steps in the preceding section. Changing your server selection does not affect documents already sent to be printed, however. The new selection will apply only to documents that you subsequently print.

Selecting a network connection

Your Macintosh computer may be connected to more than one network, or you may have two or more connections to the same network. For example, your computer may be connected to a LocalTalk network and also contain an Ethernet card that connects it directly to an Ethernet environment. Or it may contain multiple Ethernet cards, each card connecting it to a different Ethernet environment. If you have multiple network connections, you must specify which connection you want to use.

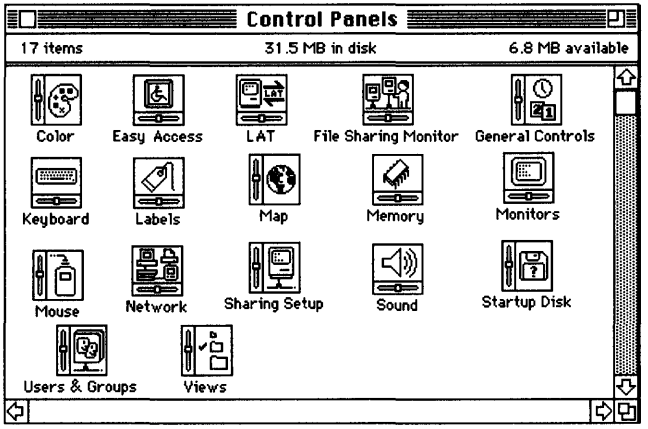
The process of selecting a network connection differs somewhat for Macintosh computers running version 7.0 and those running version 6.0.*x*. This section includes procedures for each environment.

Selecting a network connection in version 7.0

To select a network connection on a Macintosh computer running version 7.0:

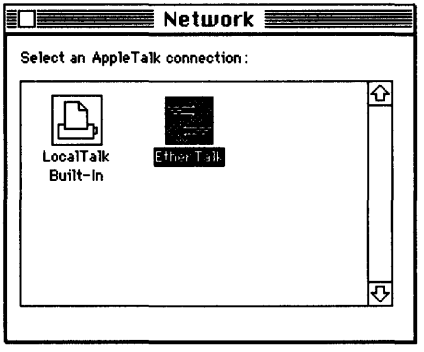
1 **Choose Control Panels from the Apple (🍎) menu.**

The Control Panels window appears. Each control panel has its own icon and can be opened like the icon for a program or a document.



2 **Double-click the Network control panel icon.**

The Network panel appears.



3 **Select the icon for the network connection that you want to use.**

The Network panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label LocalTalk Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh computer is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the Network panel.**

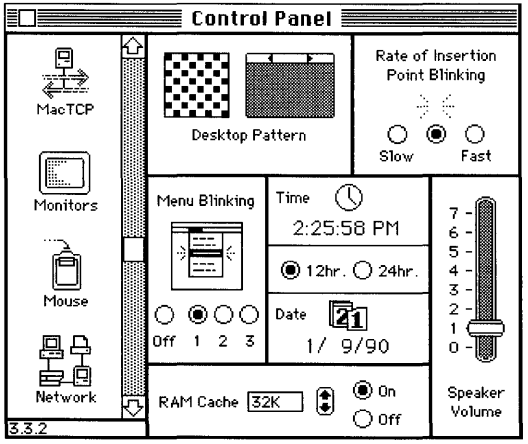
5 **Close the Control Panels window.**

Selecting a network connection in version 6.0.x

To select a network connection on a Macintosh computer running version 6.0.*x*:

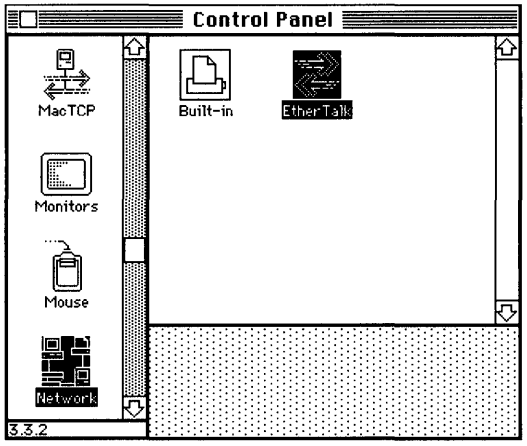
1 **Choose Control Panel from the Apple (🍎) menu.**

The Control Panel dialog box appears.



2 **Select the Network icon from the group of icons on the left side of the Control Panel dialog box.**

You may have to scroll through the list to find the Network icon.



3 **Select the icon for the network connection that you want to use.**

The Control Panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh computer is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the Control Panel dialog box.**

VMS print queues

VAXshare print servers utilize VMS print queues. A **print queue** is a list of jobs to be printed. The VMS operating system uses print queues to help manage printing tasks on the network. There are two kinds of print queues—the device queue and the generic queue.

A **device queue** is a print queue for a specific printer or specific paper tray of a printer. All printers on an Ethernet have an associated device queue that collects print jobs for that printer. If a printer has more than one paper tray, then there may be a device queue for each paper tray. Figure 3-3 shows three device queues and the printer or paper tray for which each queue collects print jobs. (Note that because the LPS40 printer has three paper trays, it could have two more device queues associated with it—one for each of the remaining paper trays.)

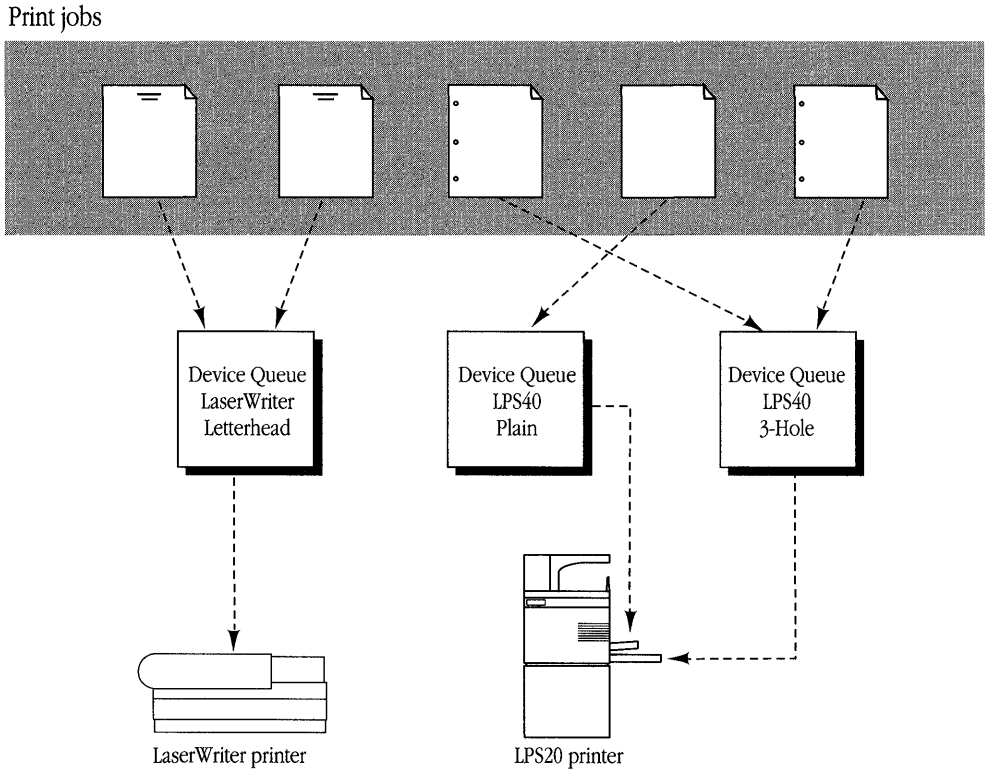


Figure 3-3 A device print queue

A **generic queue** is a print queue that collects print jobs for two or more similar device queues. Figure 3-4 shows a generic queue that feeds print jobs to two LaserWriter device queues. Jobs submitted to a generic queue are held in that queue until one of the assigned device queues becomes available.

From the Macintosh Chooser dialog box, print queues look no different from a printer or print spooler. All appear in the Chooser window when you select the LaserWriter icon, as explained earlier in this chapter, and are differentiated from one another only by their names.

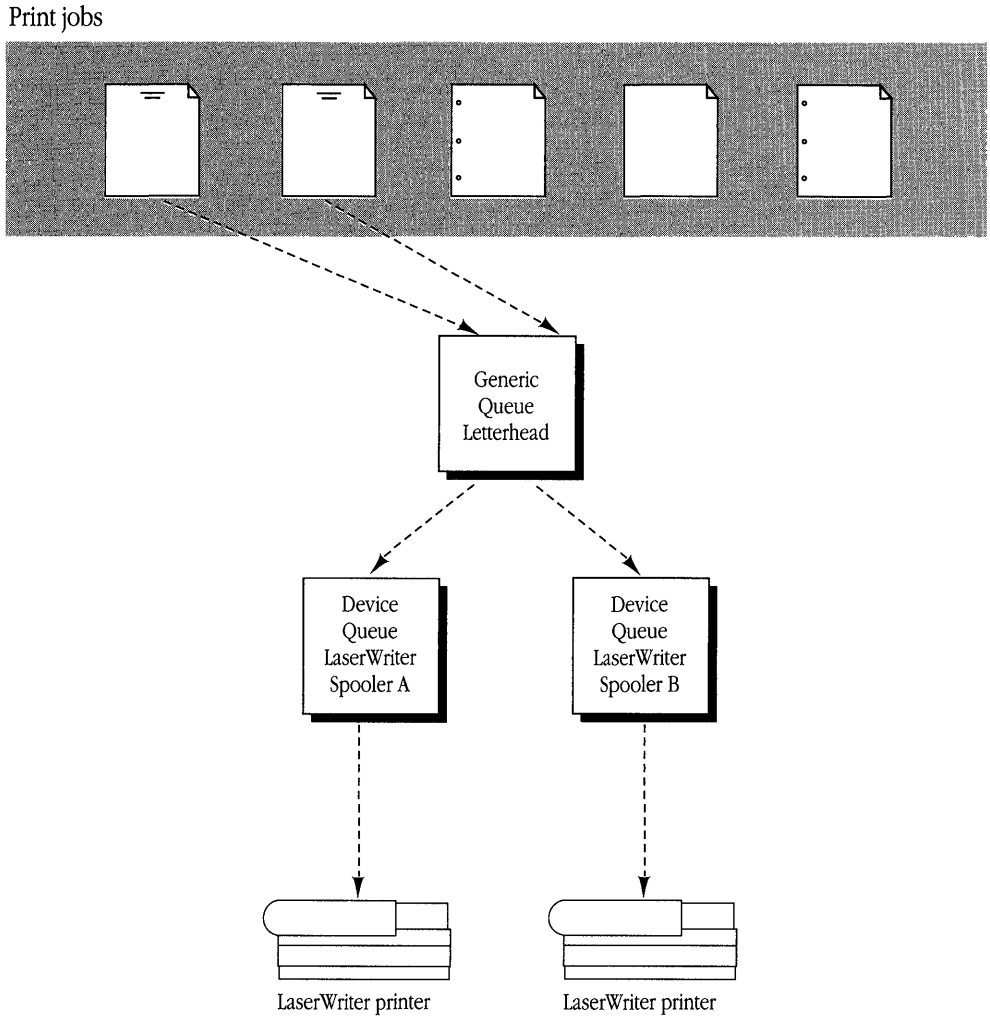


Figure 3-4 A generic print queue

◆ **Note** VAXshare provides printer services for users of the VMS operating system, as well as for Macintosh users. Specifically, VAXshare enables users to print to LaserWriter printers from the VMS operating system using standard VMS print commands. ◆

Troubleshooting

The following sections provide troubleshooting information for printing and network-related problems.

Printing problems

If you have trouble printing with a VAXshare print server, check for the following conditions:

Your document doesn't print.

If you get a message that a document can't be printed, make sure that the print server is currently available and correctly selected as your Macintosh computer's printer.

If your document doesn't print and if you're familiar with the VAXshare manager, check the status of the printer by using the `SHOW PRINTER` command, described in Appendix B. Otherwise, contact your system administrator.

If you can't print a specific document, the program printing your document may not be fully compatible with the print server. Print directly to a printer instead of to a spooler.

The print server you want isn't listed in the Chooser.

Consult your system administrator.

The wrong fonts are printing.

Make sure that the fonts needed by your document are available. A LaserWriter comes with some fonts installed. If there are additional LaserWriter fonts in the System Folder on your Macintosh, the printer can use these fonts during printing. If the font you want to use is not in your System Folder, you need to install it. Otherwise, the LaserWriter substitutes a

different font or attempts to create a version of the desired font. (Note that a LaserWriter font is not the same as a screen font.) For more information on fonts, see the LaserWriter owner's guide.

Network-related problems in version 7.0

The following conditions may occur if your Macintosh computer is running version 7.0. If one of the scenarios in the list describes a problem that you're having, it could be related to the network hardware or software that you're using.

The Network panel is missing from the Control Panels folder.

In this case, one of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The Network panel has been moved from the Control Panels folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You can't select the Network panel in the Control Panels folder. A message appears, advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear after you open the Network panel.

One of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from the Extensions folder in your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

- There is no Ethernet card in your Macintosh computer, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear when you open the Network panel.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.
- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the Extensions folder in your System Folder and drag it to the Trash.

You can't select the EtherTalk icon in the Network panel. A message appears, advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh computer with an EtherTalk startup disk or the disk that you used is damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Network panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all programs and try switching the network connection again. If you still can't switch network connections and you don't mind disrupting services that your Macintosh computer provides or is using, shut down the computer. Then restart, using a startup disk that permits network-connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start your computer. The computer can hang if it is not correctly connected to the Ethernet cable or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

Network-related problems in version 6.0.*x*

The following conditions may occur if your Macintosh computer is running version 6.0.*x*. If one of the scenarios in the list describes a problem that you're having, it could be related to the network hardware or software that you're using.

The Control Panel is missing.

The Control Panel is present on all startup disks unless you have removed it with the Font/DA Mover. If you're using more than one startup disk, your Macintosh may switch to a disk without the Control Panel installed. The icon of the current startup disk is in the upper-right corner of the desktop.

Use the Installer program from the *System Tools* disk (version 6.0.4 or later) to update your System file. The Installer automatically reinstalls the Control Panel.

The Network icon is missing from the Control Panel.

In this case, one of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The Network icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or later. (The version number appears in the lower-left corner of the Control Panel). Use the Installer program from the *System Tools* disk (version 6.0.4 or later) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the Network icon in the Control Panel. A message appears advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear in the Control Panel after you click the Network icon.

One of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- There is no Ethernet card in your Macintosh computer, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear in the Control Panel when you click the Network icon.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.
- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the System Folder and drag it to the trash.

You can't select the EtherTalk icon in the Control Panel. A message appears, advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh computer with an EtherTalk startup disk or the disk that you used is damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Control Panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all application programs and try switching the network connection again. If you still can't switch network connections and you don't mind disrupting services that your computer provides or is using, shut down your Macintosh. Then restart , using a startup disk that permits network-connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start your computer. The computer can hang if it is not correctly connected to the Ethernet cable or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

Ethernet troubleshooting checklist

Here's a checklist to consult whenever you're having trouble with Ethernet:

- Are all cables secure?

  Make sure that the network cable to your Ethernet card is secure at all connections. Also check the network cable to the service that you're trying to use. Contact your system administrator if you are uncertain about cable configuration.

- Is the problem really related to the network?

  Sometimes a problem that seems to be related to the network is actually related to the device or application program that you're using. The manual for the device or program may be helpful.

- Is your Ethernet card installed and set correctly?

  Shut down your Macintosh computer and make sure that the Ethernet card is firmly seated in its slot. Also, make sure that any jumpers and switches are set properly. See the documentation for your Ethernet card.

- Is the program that you want to use available on your network?

  If there is more than one network to which you can connect, you need to select the proper network connection. For instructions, see "Selecting a Network Connection," earlier in this module.

4 Terminal Services

VMS terminal services are services on VAX computers that can be accessed from a computer terminal, or from a Macintosh computer that is emulating a terminal. MacTerminal, an application program supplied with PATHWORKS for Macintosh, enables your Macintosh to emulate a terminal so that you can access VMS terminal services.

This chapter describes MacTerminal and the communications tools that MacTerminal uses to connect your Macintosh to terminal services and terminal service programs. This chapter also tells you how to log in to the VMS operating system and briefly discusses the Digital Command Language (DCL). Instructions for connecting to a VAX through a PBX telephone system appear in the section about modem and serial connections. At the end of the chapter, you'll find troubleshooting hints that may help if you have trouble logging in or using a terminal service program.

For detailed information about MacTerminal, including an explanation of each item in MacTerminal's menus, see the *PATHWORKS for Macintosh: MacTerminal User's Guide,* supplied with PATHWORKS for Macintosh. For more information about the communications tools, see the *Communications Tools Reference* in the *MacTerminal User's Guide* binder.

Overview of terminal services and terminal service programs

The phrase *terminal service* usually refers to an account on a computer. You log in to the account from a computer terminal for the purpose of using the operating system's command language. With PATHWORKS for Macintosh, for example, you can log in to a user account on a VAX computer and use the VMS operating system's Digital Command Language (DCL).

A terminal service, however, can also be an application program that you can use from a computer terminal without first having to log in to the computer on which the program runs. This guide calls the latter kind of terminal service a **terminal service application program.**

PATHWORKS for Macintosh provides access to both kinds of terminal services; however, most of this chapter describes how to connect and log in to the VMS operating system. The section "Using Terminal Service Applications," near the end of this chapter, discusses how to connect to and use the programs that don't require you to log in to the VAX.

Logging in to the VMS operating system lets you use DCL commands to perform a variety of tasks:

- Develop and execute programs.
- Work with files—for example, editing text.
- Provide security and ensure that resources are used efficiently. For example, you can set access privileges for a VAXshare file-server volume.
- Customize your work environment. You can specify your own equivalents for commands and write small programs, called *command procedures,* that carry out commonly used series of commands. For example, you can type `home` rather than `set default sys$login`.
- Get information about the system.
- Work with disks, magnetic tape drives, and other devices.

Figures 4-1, 4-2, and 4-3 show how three different network connection tools—the LAT Tool, the AppleTalk-LAT Tool, and the CTERM Tool, respectively—are used to create the connection between the Macintosh computer and the Digital network. Note that the software components can be found in the folders indicated in these figures only if the Macintosh is running system software version 7.0. To find out where these components are installed in a version 6.0.*x* environment, see the section "Where the Software Is Located" in the *Installation* part of this binder.

As discussed in Chapter 1, you can connect your Macintosh to a VAX computer in several different ways. For instance, you can make the physical connection to a VAX through a LocalTalk or Ethernet network as shown in Figure 4-2. You can also connect your Macintosh directly to a single VAX through a serial cable or by using a modem. The advantage of a network connection is that it gives you access to many VAX computers at once. This chapter concentrates on network connections; for information on the other kinds of connections, see "Modem and Serial Connections," later in this chapter.

◆ **Note** If the symbols and terminology shown in these figures are unfamiliar to you, you may want to read Appendix A, which discusses network terms and concepts. ◆

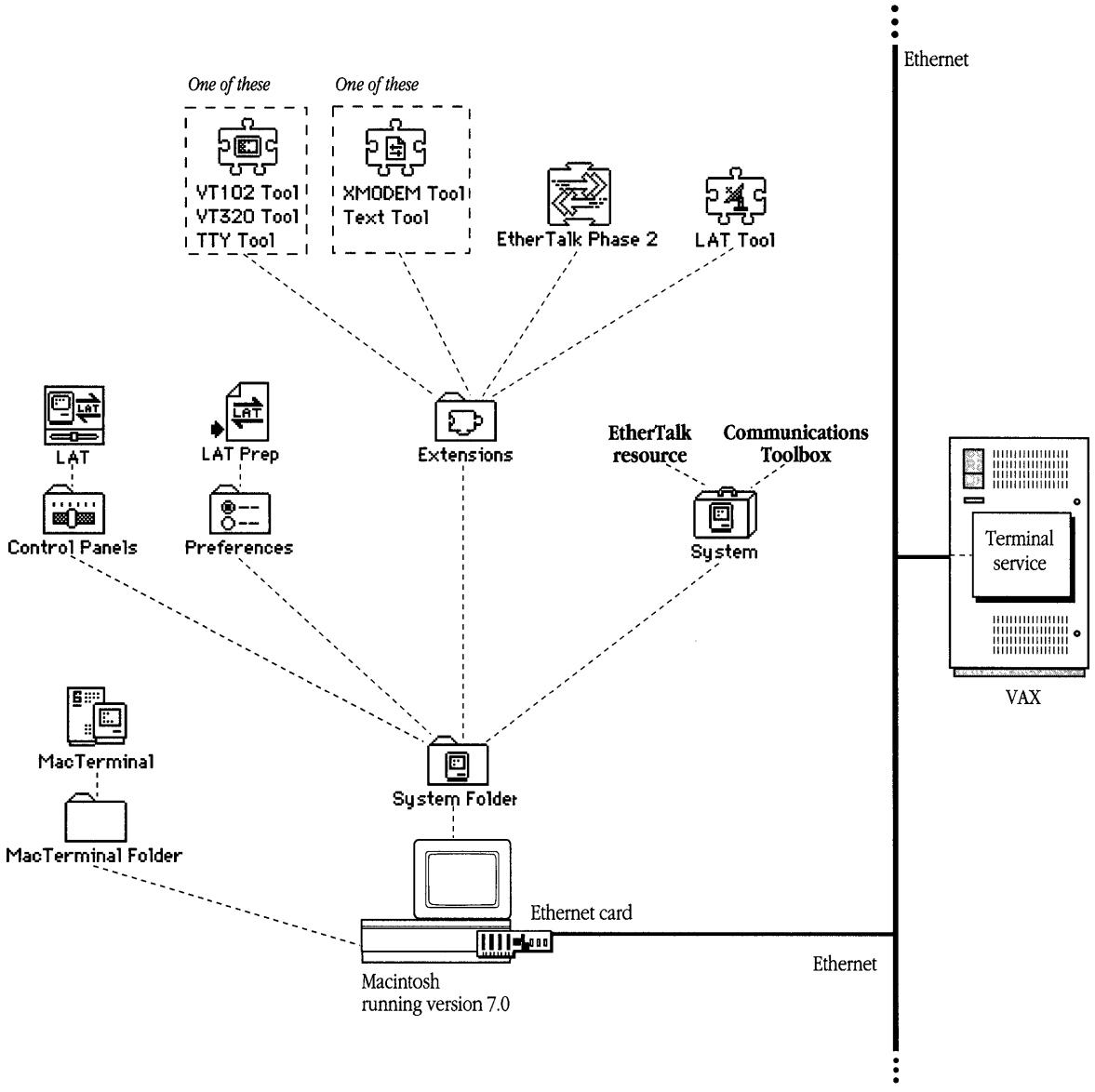


Figure 4-1 A terminal connection using the LAT Connection Tool

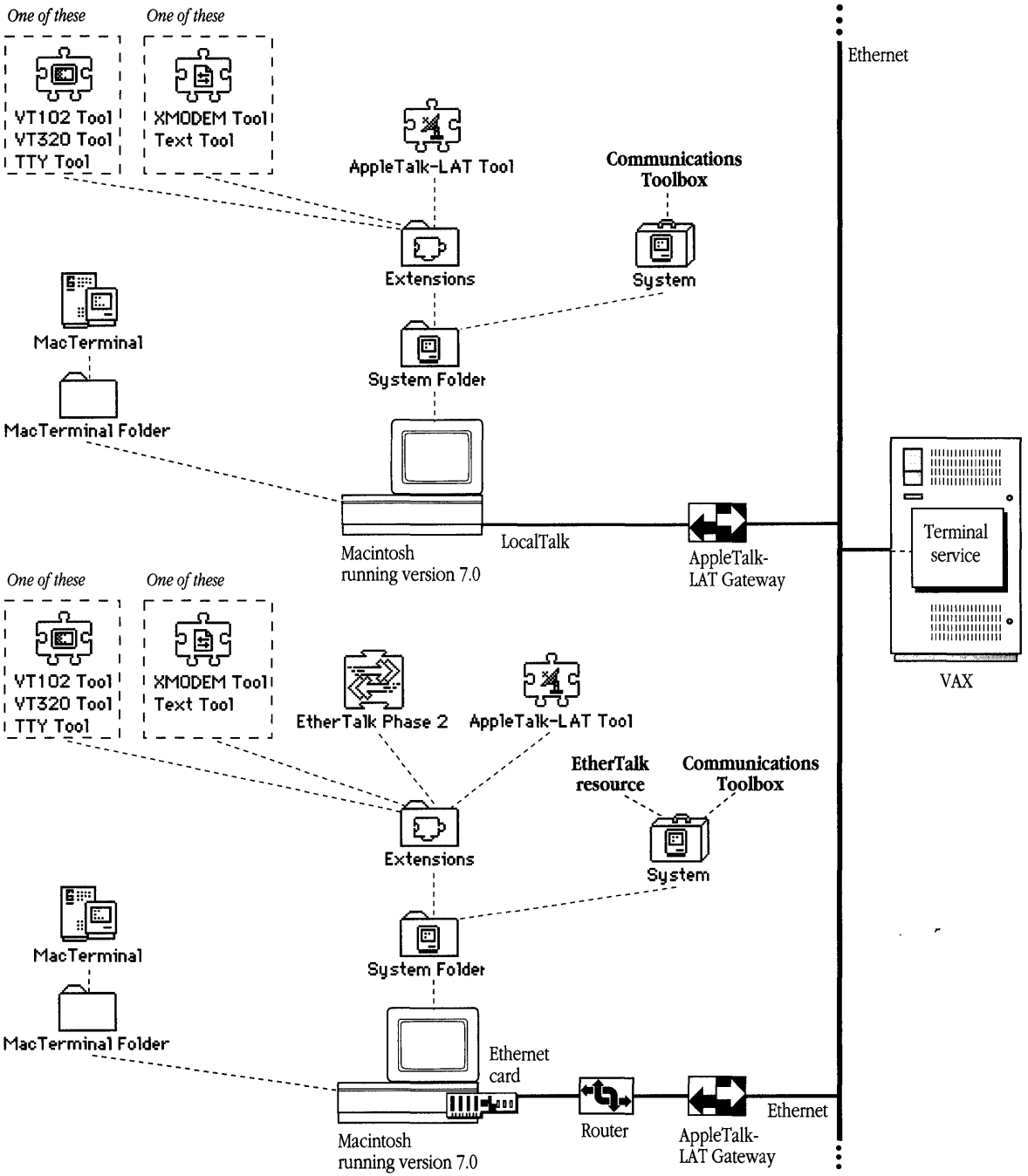


Figure 4-2 A terminal connection using the AppleTalk-LAT Connection Tool

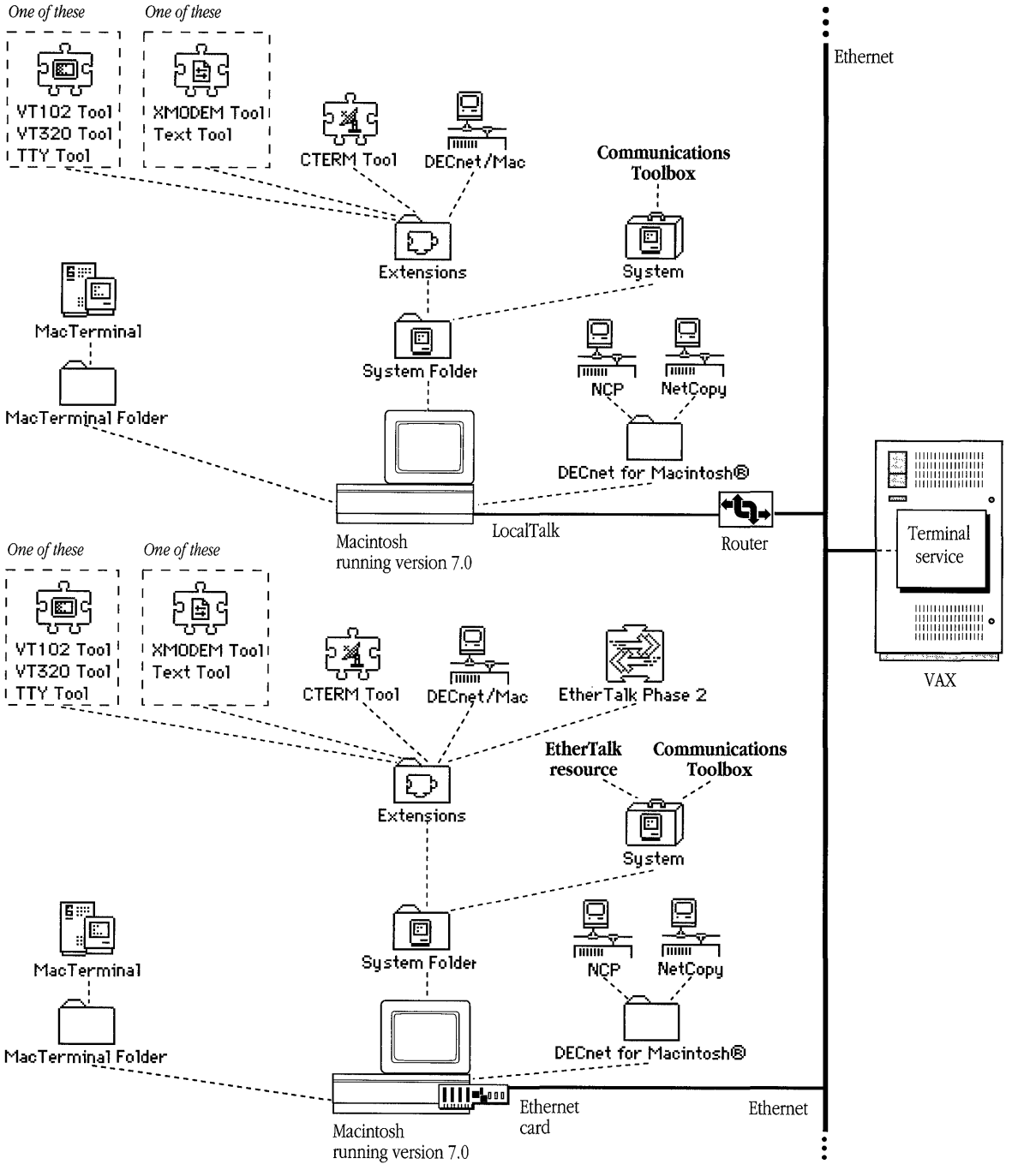


Figure 4-3 A terminal connection using the CTERM Connection Tool

MacTerminal and the communications tools

MacTerminal is an application program that lets your Macintosh computer emulate a Digital terminal. With MacTerminal and appropriate **communications tools,** which are pieces of software that manage specific communications tasks for a communications program, you can gain access to terminal services on a VAX computer.

◆ **Note** You can also log in to a VAX computer by using MacX. See "Starting DECterm" in Chapter 2 of the *PATHWORKS for Macintosh: MacX User's Guide.* ◆

Communications tools fall into three categories:

- **Terminal emulation tools,** which determine the type of terminal that your Macintosh will emulate during the communications session. The terminal emulation tools provided with PATHWORKS for Macintosh include the TTY Terminal Emulation Tool, the VT102 Terminal Emulation Tool, and the VT320 Terminal Emulation Tool.
- **Connection tools,** which define the type of connection that is established between your Macintosh computer and the VAX computer or Digital network. The connection tools provided with PATHWORKS for Macintosh include the Apple Modem Connection Tool, the AppleTalk ADSP Connection Tool, the AppleTalk-DECnet Connection Tool, the AppleTalk-LAT Connection Tool, the CTERM Connection Tool, the LAT Connection Tool, and the Serial Connection Tool.
- **File-transfer tools,** which ensure that files are transferred intact between your Macintosh computer and the VAX computer or Digital network. The file transfer tools provided with PATHWORKS for Macintosh include the Text File Transfer Tool and the XMODEM File Transfer Tool

Depending on the way in which your Macintosh is connected to a Digital network or VAX computer, you'll need to select and configure different communications tools within these categories. With MacTerminal, you do this from within a **session document.** The next section describes how to use session documents to conduct communications sessions.

Communications sessions and session documents

When you use the MacTerminal program to connect to another computer, you are conducting a **communications session.** During a communications session, you work within a session document. A MacTerminal session document lets you configure the communications tools that you will be using. The session document also provides a display area in which you see and work with incoming or outgoing data. You can open a session document, move and resize its window, and name and save the session document, just as you would perform these operations with documents in any other Macintosh program. While you are using MacTerminal, you can have multiple session documents open at the same time—the number of documents that can be open is limited only by the available memory.

When you open a new session document, you use the commands in the Settings menu to configure the session document. A new session document is preset to use the VT102 Terminal Emulation Tool, the Apple Modem Connection Tool, and the XMODEM File Transfer Tool. If any of these tools is missing, MacTerminal uses another tool in the same category. (See the *PATHWORKS for Macintosh: MacTerminal User's Guide* for an explanation of how MacTerminal chooses another tool.) MacTerminal will not run unless both a terminal emulation tool and a connection tool are installed. For further information about configuring a session document, see the *MacTerminal User's Guide.*

Here's a summary of the steps that you follow during your first communications session:

1. Start MacTerminal. A new MacTerminal session document, called *Untitled-1,* appears.
2. Configure the session document by selecting a connection tool and terminal emulation tool. If you are sending or receiving data, you must also select a file-transfer tool. If you use one of the **sample session documents** provided in the MacTerminal application folder, most of this procedure is taken care of for you.
3. Save the session document so that you can use the settings whenever you like.
4. Choose Open Connection from the Session menu.
5. Interact with the computer to which you've connected. For example, log in to and work with the VMS operating system.

6. End the communications session.
   For example, log out of the VMS operating system and close the connection.

For subsequent communications sessions with the same computer, you need only open the session document that you've configured, and proceed with steps 4 through 6.

The user's guide section of the *PATHWORKS for Macintosh: MacTerminal User's Guide* describes in detail how to set up session documents and how to use the preconfigured sample session documents supplied with MacTerminal. The remainder of this section provides specific information related to setting up session documents for using PATHWORKS for Macintosh terminal services.

Choosing a connection tool

The first step in setting up a session document is to determine the type of connection. PATHWORKS for Macintosh includes six connection tools that can be used with MacTerminal to access terminal services:

- LAT Connection Tool
- AppleTalk-LAT Connection Tool
- CTERM Connection Tool
- AppleTalk ADSP Connection Tool
- Apple Modem Connection Tool
- Serial Connection Tool

Although other factors may influence your decision, your choice of connection tool depends primarily on the physical connection between your Macintosh computer and the VAX computer hosting the terminal services that you want to use. The LAT, AppleTalk-LAT, and CTERM connection tools work over a network connection. The other two tools, as their names imply, provide the software connections for communications using modems and for direct serial links.

LAT Tool

The Local Area Transport (LAT) communications protocol provides high-speed, asynchronous communications for terminals connected to Ethernet **local area networks.** If your Macintosh computer is connected to an Ethernet environment through an Ethernet card, such as the Apple EtherTalk NB Card, you will likely want to set up your session document to use the LAT Connection Tool. Note, however, that the LAT protocol *does not* work over a router. Thus, if your computer is connected to Ethernet through LocalTalk and a router, you must choose some other type of connection tool, such as the AppleTalk-LAT Tool.

"Using the VAX LAT Session Document," later in this chapter, tells you how to use a session document configured with the LAT Tool to access terminal services.

AppleTalk-LAT Tool

The AppleTalk-LAT Connection Tool allows you to establish LAT connections between your Macintosh computer and VAX computers, whether your Macintosh is on a LocalTalk or Ethernet LAN. You will likely set up your session document to use the AppleTalk-LAT Connection Tool if these conditions exist:

- Your computer is connected to a LocalTalk network.
- You want to initiate a LAT session to a VAX computer that is on a different physical network (that is, you need to go through a router to connect to the VAX).

The AppleTalk-LAT Tool uses the services of the AppleTalk-LAT Gateway to provide transport between the AppleTalk and LAT protocols.

The section "Using the VAX AppleTalk-LAT Session Document" later in this chapter, tells how to use a session document configured with the AppleTalk-LAT Tool to access terminal services.

CTERM Tool

The CTERM Connection Tool provides task-to-task communications for terminals connected to DECnet **wide area networks**. If your Macintosh computer is connected to an Ethernet environment through an Ethernet card and you want a terminal connection through DECnet, you will likely want to set up your session document to use the CTERM Connection Tool.

The CTERM Connection Tool also works over LocalTalk networks if the router connected to the LocalTalk network supports DECnet. If you have the CTERM Tool and the DECnet/Mac Driver installed, then you can access terminal services through your LocalTalk connection to Ethernet.

The section "Using the VAX CTERM Session Document" later in this chapter, tells how to use a session document configured with the CTERM Tool to access terminal services.

Apple Modem and Serial Tools

The Apple Modem and Serial connection tools let you access VAX terminal services if your Macintosh is not connected to Ethernet. See "Modem and Serial Connections," later in this chapter, for information about these types of connections.

AppleTalk ADSP Tool

The AppleTalk ADSP Connection Tool is provided with PATHWORKS for Macintosh primarily to let you connect your Macintosh computer to another Macintosh on the network. If you are interested in establishing communications with another Macintosh, see "Connecting to Another Macintosh Computer on the Network," later in this chapter. For more information, see the "AppleTalk ADSP Connection Tool" reference module in the *Connection Tools* part of the *PATHWORKS for Macintosh: MacTerminal User's Guide.*

Choosing a terminal emulation tool

Three terminal emulation tools are provided with PATHWORKS for Macintosh:

- TTY Terminal Emulation Tool (TTY Tool)
- VT102™ Terminal Emulation Tool (VT102 Tool)
- VT320™ Terminal Emulation Tool (VT320 Tool)

The VT102 and VT320 Tools emulate standard Digital terminals. Either one is appropriate for using VAX terminal services. The VT320 Tool provides both VT102 and VT320 terminal emulation. The VT320 software module is larger than the VT102 software module, however, so if storage space on your disk drive or memory is a consideration, you may want to use the VT102 Tool. Refer to the "VT102 Terminal Emulation Tool" and "VT320 Terminal Emulation Tool" reference modules in the *Communications Tools* part of the *PATHWORKS for Macintosh: MacTerminal User's Guide* for more information.

The TTY Tool emulates a basic, line-oriented terminal. You might want to use the TTY Tool to access timesharing or information services that do not require a specific terminal.

Choosing a file-transfer tool

PATHWORKS for Macintosh includes two file-transfer tools:

- Text File Transfer Tool (Text Tool)
- XMODEM File Transfer Tool (XMODEM Tool)

MacTerminal session documents are preconfigured to use the XMODEM Tool. The Text Tool can only send plain text files, and you cannot use it to receive files. The XMODEM Tool can both send and receive files, and provides error-free file transfers. In order for you to use the XMODEM Tool on your Macintosh, the remote computer must be running XMODEM software. Talk to your system administrator if you need to perform XMODEM file transfers and you're unsure whether or not the VAX has an XMODEM utility.

For more information about the file-transfer tools, see the reference modules in the *File-Transfer Tools* part of the *PATHWORKS for Macintosh: MacTerminal User's Guide.*

Connecting to another Macintosh computer on the network

You can use the AppleTalk ADSP Connection Tool to communicate with a coworker on your network.

To communicate with another Macintosh user:

1 **Open and configure a MacTerminal session document with the AppleTalk ADSP Tool on your Macintosh.**

The coworker with whom you wish to communicate must also perform this step.

2 **Choose Wait for Connection from the Session menu.**

When your coworker chooses Open Connection from the Session menu, you will be able to type messages to each other. The text that you type will appear on your coworker's screen, and the text that your coworker types will appear on your screen.

Of course, your coworker may be the one who chooses Wait for Connection, and you may be the one who chooses Open Connection from the Session menu.

To end the session with your coworker, choose Close Connection from the Session menu.

Connecting to a VAX computer on the network

PATHWORKS for Macintosh includes various sample session documents that provide connections to VAX computers. This section describes how to use the following session documents:

- **VAX LAT Connection**—establishes a LAT connection to VAX terminal services on an Ethernet local area network (LAN). The VAX LAT Connection session document is preconfigured with the following tools: the LAT Connection Tool, VT320 Terminal Emulation Tool, and Text File Transfer Tool.
- **VAX AppleTalk-LAT Connection**—establishes a LAT connection to VAX terminal services on an AppleTalk internet (including LocalTalk). The VAX AppleTalk-LAT Connection session document is preconfigured with the following tools: the AppleTalk-LAT Connection Tool, VT320 Terminal Emulation Tool, and Text File Transfer Tool.
- **VAX CTERM Connection**—establishes a CTERM connection to VAX terminal services on an AppleTalk internet. The VAX CTERM Connection session document is preconfigured with the following tools: the CTERM Connection Tool, VT320 Terminal Emulation Tool, and Text File Transfer Tool.

If your Macintosh computer is connected to more than one network, you need to follow the steps given in the next section, "Selecting a Network Connection," before going further. If your Macintosh has only one network connection, then skip "Selecting a Network Connection" and read "Using the VAX LAT Connection Session Document," "Using the VAX AppleTalk-LAT Connection Session Document," or "Using the CTERM Connection Session Document" (depending on the connection you want to make).

Selecting a network connection

Your Macintosh computer may be connected to more than one network, or you may have two or more connections to the same network. For example, your computer may be connected to a LocalTalk network and also contain an Ethernet card that connects it directly to an Ethernet environment. Or it may contain multiple Ethernet cards, each card

connecting it to a different Ethernet environment. If you have multiple network connections, you must specify which connection you want to use.

Note that if you are using the VAX LAT Connection session document to establish a connection to VAX terminal services, you use the LAT control panel to select your network connection. If you are using the VAX AppleTalk-LAT or the VAX CTERM Connection session document, you use the Network control panel.

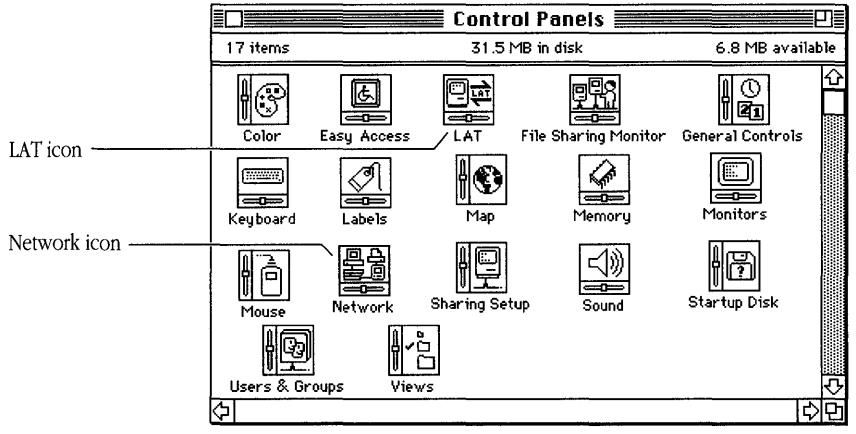
The process of selecting a network connection differs somewhat for Macintosh computers running version 7.0 and those running version 6.0.*x*. This section includes procedures for each environment.

Selecting a network connection in version 7.0

To select a network connection on a Macintosh computer running version 7.0:

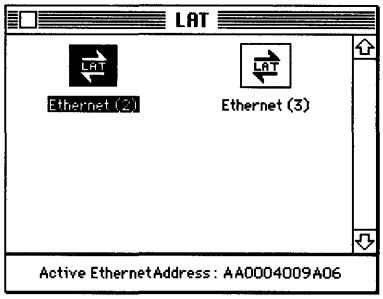
1 Choose Control Panels from the Apple (🍎) menu.

The Control Panels window appears. Each control panel has its own icon and can be opened like the icon for a program or a document.

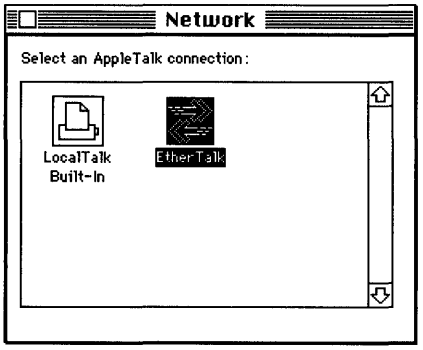


2 Double-click the appropriate control panel icon.

a. If you are using the VAX LAT Connection session document, double-click the LAT icon. The LAT panel appears.



b. If you are using the VAX AppleTalk-LAT or VAX CTERM Connection session document, double-click the Network icon.
The Network panel appears.



3 **Select the icon for the network connection that you want to use.**

A separate icon is displayed for each network to which your Macintosh computer is connected. A connection to a LocalTalk network is represented by an icon labeled LocalTalk Built-in. A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your computer is connected to more than one Ethernet environment, each icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the panel (either the LAT or Network panel).**

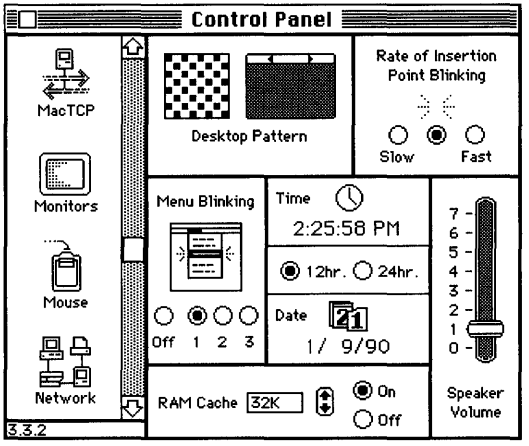
5 **Close the Control Panels window.**

Selecting a network connection in version 6.0.x

To select a network connection on a Macintosh computer running version 6.0.*x*:

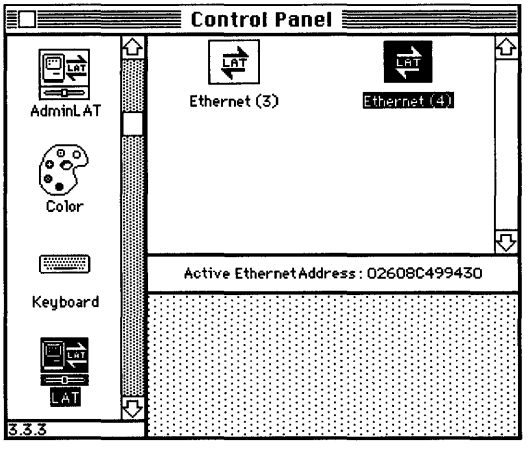
1 **Choose Control Panel from the Apple (🍎) menu.**

The Control Panel dialog box appears.

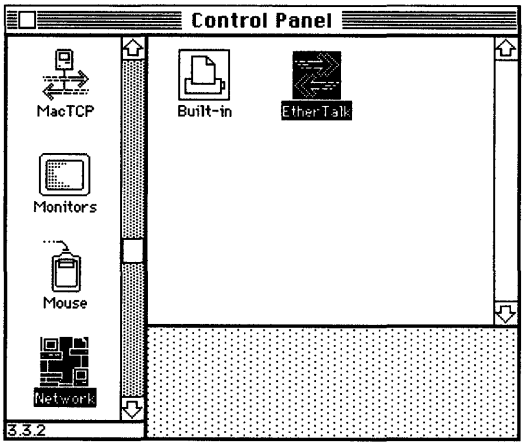


2 **Select the appropriate icon from the group of icons on the left side of the Control Panel dialog box.**

a. If you are using the VAX LAT Connection session document, select the LAT icon.



b. If you are using the VAX AppleTalk-LAT or VAX CTERM Connection session document, select the Network icon.



3 **Select the icon for the network connection that you want to use.**

The Control Panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh computer is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the Control Panel dialog box.**

Using the VAX LAT Connection session document

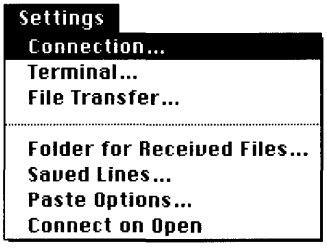
The VAX LAT Connection session document is preconfigured to let you establish LAT connections to a VAX computer, with your Macintosh computer emulating a VT320 terminal. After starting the MacTerminal program and opening the VAX LAT Connection session document, you select a LAT terminal service from the Connection Settings dialog box. After you save the session document for future use, you can then open the connection to the VAX.

To select and connect to a LAT terminal service:

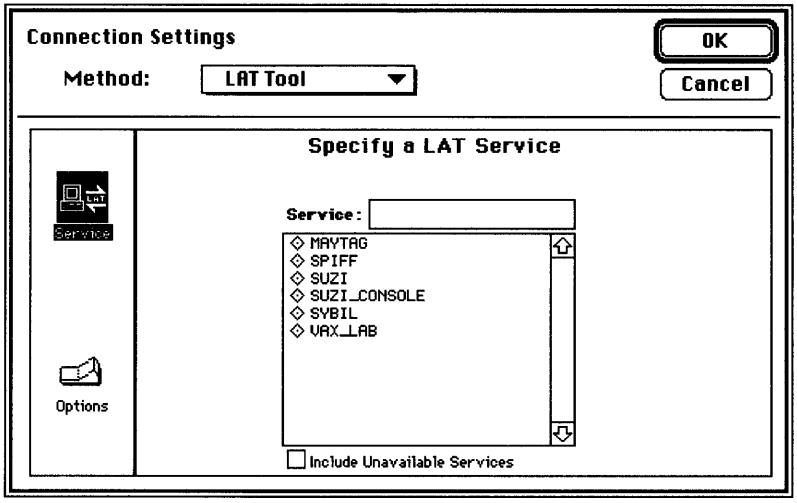
1 **Open the VAX LAT Connection session document.**

To open the session document, start MacTerminal, choose Open from the File menu, and select VAX LAT Connection from the MacTerminal Documents folder. Or you can double-click the VAX LAT Connection icon in the MacTerminal Documents folder.

2 **Choose the Connection command from the Settings menu.**



The Connection Settings dialog box appears. Because the VAX LAT Connection session document is preconfigured to use the LAT Connection Tool, the Method pop-up menu shows *LAT Tool,* and a list of the available LAT terminal services on your network appears.



3 **Select the LAT terminal service you want to use.**

Depending on the number of services available, you may need to scroll through the list to find the desired service.

The LAT terminal service that you select appears in the Service box.

4 **Click the OK button.**

You are now ready to open a connection to the service that you've selected.

5 **Save your session document.**

Using the VAX AppleTalk-LAT Connection session document

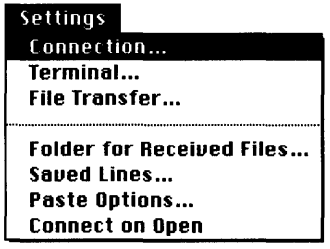
This section describes how to use the VAX AppleTalk-LAT Connection session document to establish an AppleTalk-LAT connection to VAX terminal services. The VAX AppleTalk-LAT Connection session document is preconfigured to let you establish AppleTalk-LAT connections to a VAX computer through an AppleTalk-LAT gateway, with your Macintosh computer emulating a VT320 terminal. After starting the MacTerminal program and opening the VAX AppleTalk-LAT Connection session document, you select an AppleTalk-LAT Gateway and a LAT terminal service from the Connection Settings dialog box. After you save the session document for future use, you can then open the connection to the VAX computer.

To select and connect to a LAT terminal service using the AppleTalk-LAT Connection Tool:

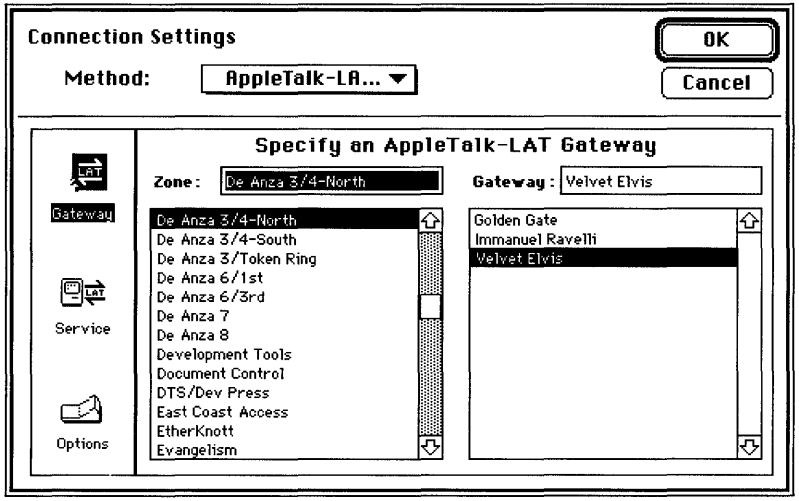
1 **Open the VAX AppleTalk-LAT Connection session document.**

To open the session document, start MacTerminal, choose Open from the File menu, and select VAX AppleTalk-LAT Connection from the MacTerminal Documents folder. Or you can double-click the VAX AppleTalk-LAT Connection icon in the MacTerminal Documents folder.

2 **Choose the Connection command from the Settings menu.**



The Connection Settings dialog box appears. Because the VAX AppleTalk-LAT Connection session document is preconfigured to use the AppleTalk-LAT Connection Tool, the Method pop-up menu shows *AppleTalk-LAT Tool.*



3 **Select the zone containing the AppleTalk-LAT Gateway that you want to use. The available zones are listed at the left side of the dialog box.**

Your system administrator can tell you the name of the zone that contains an AppleTalk-LAT Gateway.

The zone that you select appears in the Zone box.

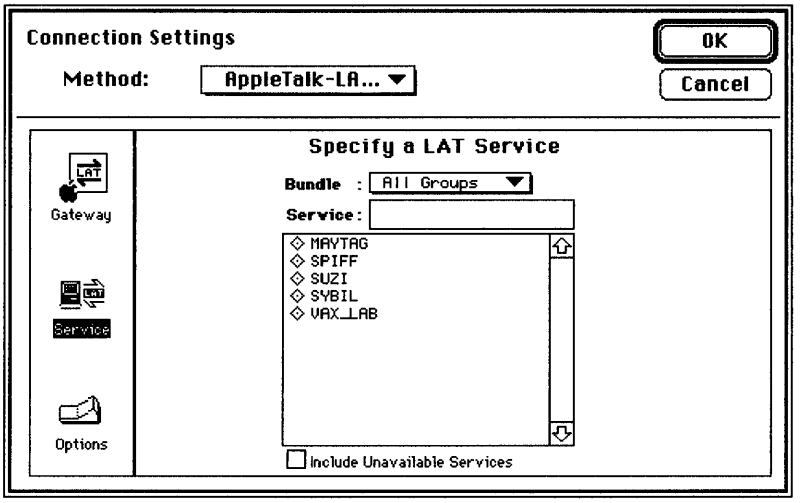
4 **Select the AppleTalk-LAT Gateway that you want to use. The available gateways are listed at the right side of the dialog box.**

Your system administrator can tell you which AppleTalk-LAT Gateway to use.

The gateway that you select appears in the Gateway box.

5 **Select the Service icon from the group of icons at the far left side of the dialog box.**

The Connection Settings dialog box appears.



6 **Select the LAT terminal service that you want to use.**

Depending on the number of services available, you may need to scroll through the list to find the desired service. If your system administrator has created groups of services, you may also need to select a group from the Bundle pop-up menu near the center of the dialog box.

The LAT terminal service that you select appears in the Service box.

7 **Click the OK button.**

You are now ready to open a connection to the service that you've selected.

8 **Save your session document.**

Using the VAX CTERM Connection session document

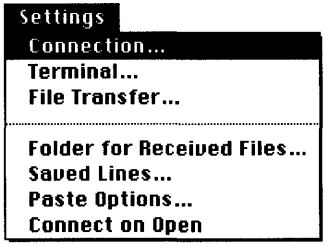
This section describes how to use the VAX CTERM connection session document to establish a CTERM connection to VAX terminal services. The VAX CTERM Connection session document is preconfigured to let you establish CTERM connections to a VAX computer, with your Macintosh computer emulating a VT320 terminal. After starting the MacTerminal program and opening the VAX CTERM Connection session document, you select a DECnet node from the Connection Settings dialog box. After you save the session document for future use, you can then open the connection to the VAX.

To select and connect to a DECnet node using the CTERM Connection Tool:

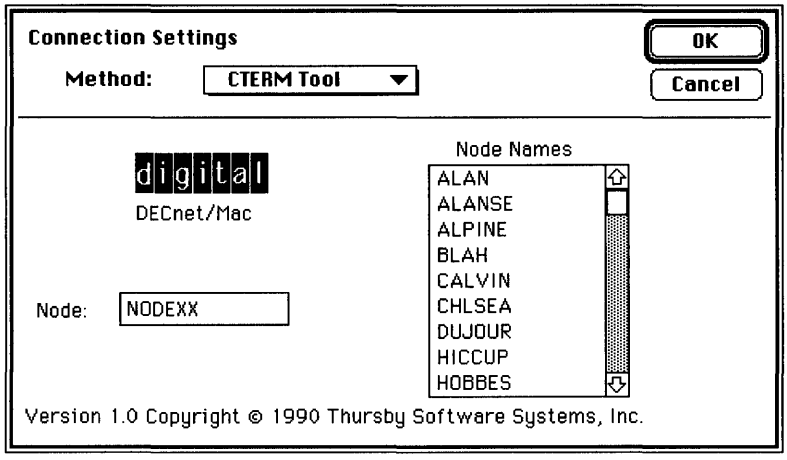
1 **Open the VAX CTERM Connection session document.**

To open the session document, start MacTerminal, choose Open from the File menu, and select VAX CTERM Connection from the MacTerminal Documents folder. Or you can double-click the VAX CTERM Connection icon in the MacTerminal Documents folder.

2 **Choose the Connection command from the Settings menu.**



The Connection Settings dialog box appears. Because the VAX CTERM Connection session document is preconfigured to use the CTERM Tool, the Method pop-up menu shows *CTERM Tool.*



3 **Select a DECnet node to which you want to connect from the Node Names list.**

The node that you select appears in the Node box.

4 **Click the OK button.**

You are now ready to open a connection to the service that you've selected.

5 **Save your session document.**

△ **Important** What you need to do next depends on the type of terminal service that you've selected. If you selected a user account on a VAX computer, then you need to log in to the account, as described in the following section, "Logging in to the VMS Operating System." If you selected a terminal service application program, then skip ahead to "Using Terminal Service Applications." △

Logging in to the VMS operating system

This section tells you how to log in to the VMS operating system after you've opened a connection to the VAX computer, such as a connection from a LAT, AppleTalk-LAT, or CTERM session document as described in the preceding sections. (See "Modem and Serial Connections," later in this chapter, for information about connecting to a VAX computer if you are not on a network.)

To log in from a session document:

1 **Open the session document that is set up for the service you want to use.**

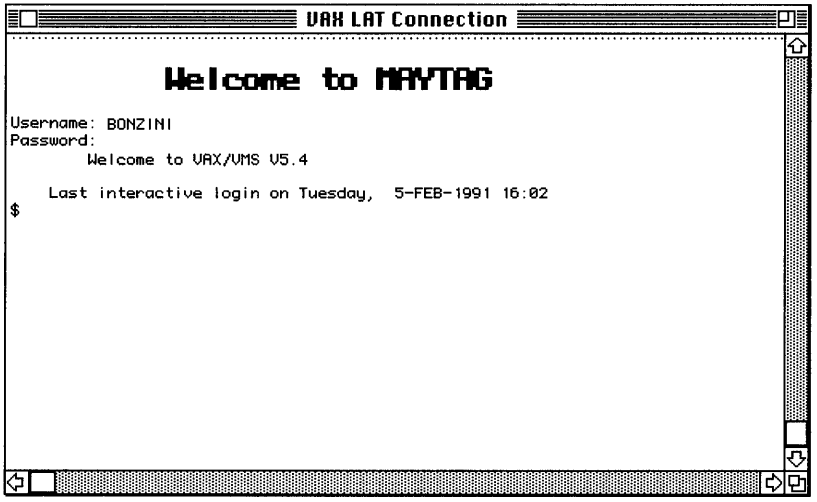
2 **Choose Open Connection from the Session menu.**

The welcome message from the VAX computer appears, as well as a prompt for your user name. On most systems, you must respond to the prompt within 30 seconds or so, or the VAX disconnects you. (The interval during which the VAX waits for you to respond is called the *timeout period.* If there is no activity at your end, and the VAX disconnects you, the VAX is said to have *timed out.*)

3 **Type your user name and press Return.**

4 **Type your password and press Return.**

If you have entered your user name and password correctly, you are logged in to your VAX account, and the $ prompt appears.



◆ **Note** A *prompt* is a request from a computer for information, such as a password or the next command that you want to give the computer. A prompt usually appears in the form of an abbreviated question. The $ prompt from the VAX computer indicates that the VAX is ready to receive your commands. ◆

Using DCL commands

As discussed in the introduction to this chapter, DCL is a powerful command language with which you can communicate with the VMS operating system and perform useful tasks.

Although it is not the purpose of this guide to teach you how to use DCL commands, this section includes two procedures that may be useful and that you can use to begin interacting with the VMS operating system:

- changing your password
- displaying on your Macintosh a directory of files that reside on the VAX

Refer to the *VMS User's Manual* for detailed information on the VMS operating system and DCL.

Changing your password

It is recommended that you change your VMS password from time to time, just in case someone else learns your current password.

To change your VMS password:

1 **Log in to your account as described in "Logging in to the VMS Operating System," earlier in this chapter.**

2 **At the `$` prompt, type `SET PASSWORD` and press Return.**

VMS asks you to enter your current (old) password.

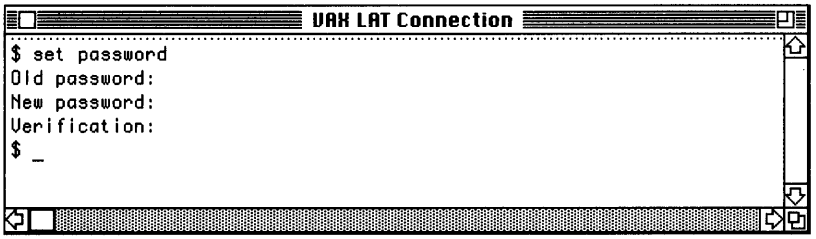
3 **Type your current password and press Return.**

Note that for security, what you type does not appear on the screen. VMS asks you to enter a new password.

4 **Type the new password and press Return.**

Again, what you type does not appear on the screen. VMS asks you to confirm the new password by entering it a second time.

The following figure shows the sequence of commands and responses for changing the VMS account password.



Listing a VMS file directory

If you plan to create and use VMS documents, it is helpful to get lists of the files in your VMS directories. This section describes how to use the DCL `DIR` command to list the files in the current directory.

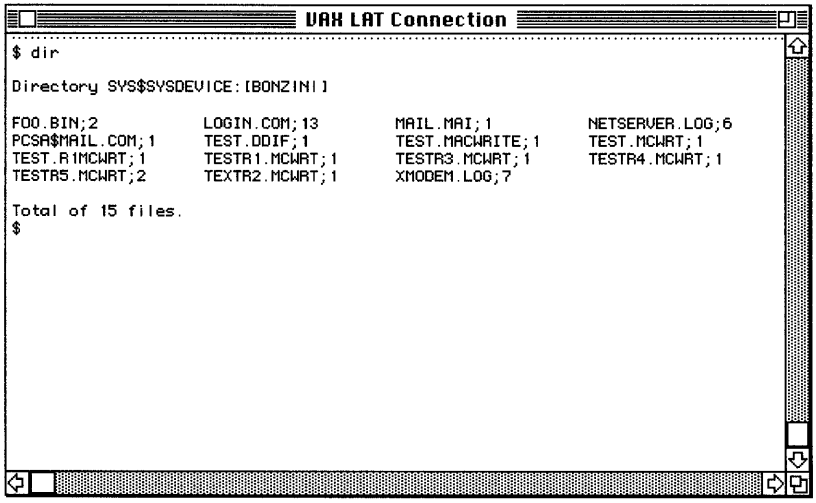
The directory that is current when you log in to your account on a VAX is called your *login directory*. Therefore, if you issue the `DIR` command when you first log in, you will get a list of the files in your login directory, as demonstrated by the following steps. See your *VMS User's Manual* for information about VMS directories.

To list the files in a VMS directory:

1 **Log in to your account as described in "Logging In to the VMS Operating System," earlier in this chapter.**

2 **At the `$` prompt, type `DIR` and press Return.**

VMS lists the files in the current directory. The following figure shows an example of a VMS directory list.

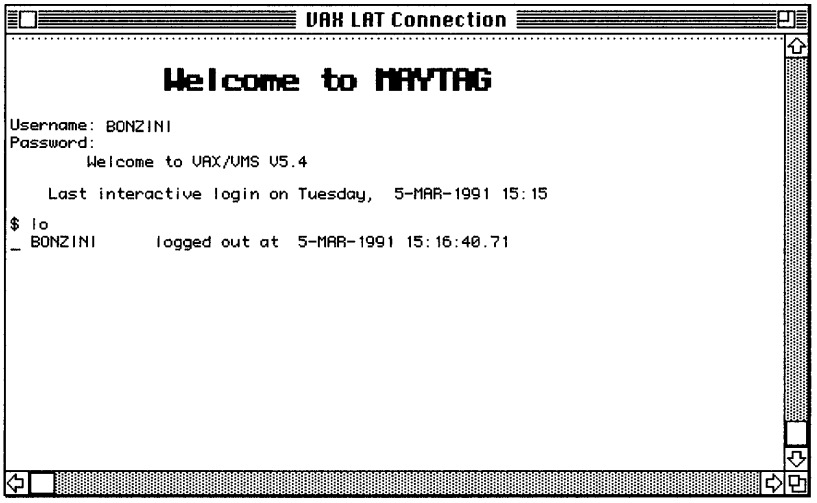


Logging out of the VMS operating system

This section tells you how to log out of the VMS operating system.

To log out:

1 **At the `$` prompt, type `LOGOUT` and press Return. (If you are connected through a modem, type `LOGOUT/HANGUP`.)**



2 **Choose Close Connection from the Session menu.**

3 **Close the current session document by choosing Close from the File menu or by clicking the Close box in the upper-left corner of the session document window.**

You'll be given the chance to rename the document and to save it on another disk.

4 **When you have finished using MacTerminal, choose Quit from the File menu.**

Using terminal service programs

VMS terminal service application programs run on VAX computers. You can use these programs without first logging in to the VMS operating system.

To access a terminal service program, you must set up a session document in the usual way. MacTerminal requires that you choose and configure both a connection tool and a terminal emulation tool. You are not required, however, to choose a file-transfer tool, and you probably won't need one when you use a terminal service program. The VT320 Tool is the usual choice for a terminal emulation tool when you connect to a VAX computer. If you are more familiar with VT102 terminals, however, you may want to choose the VT102 Tool instead.

You can use the LAT Connection Tool to access terminal service programs. Choose and configure the LAT Tool as described in the "LAT Connection Tool" reference module in the *MacTerminal Communications Tools Reference*. (This communications tools reference is in the *PATHWORKS for Macintosh: MacTerminal User's Guide* binder.) When the LAT Tool presents the list of available services, specify the terminal service program that you want to use.

◆ **Note** As mentioned in "Choosing a Connection Tool," earlier in this chapter, the LAT Tool works only when your Macintosh computer is connected to an Ethernet environment through an Ethernet card. If your Macintosh is connected to a LocalTalk network, the LAT Tool will not work—you'll need to use the AppleTalk-LAT or CTERM Connection Tool. ◆

Note that if your Macintosh is connected to more than one network, you need to follow the steps given in "Selecting a Network Connection," earlier in this chapter, before you can access terminal service programs.

When you choose Connect from the MacTerminal Session menu, you are not prompted to log in to the VMS operating system. Instead, the terminal service program should run automatically. The program may or may not request your user name, password, or both. For information about using the program, refer to the documentation for that program.

Modem and serial connections

Figure 4-4 shows both modem and serial connections between Macintosh computers and a VAX computer. Although most of the network services described in this guide are not available to you if your Macintosh is connected to a VAX only by modem or by serial cable, you can still use certain terminal services through such connections.

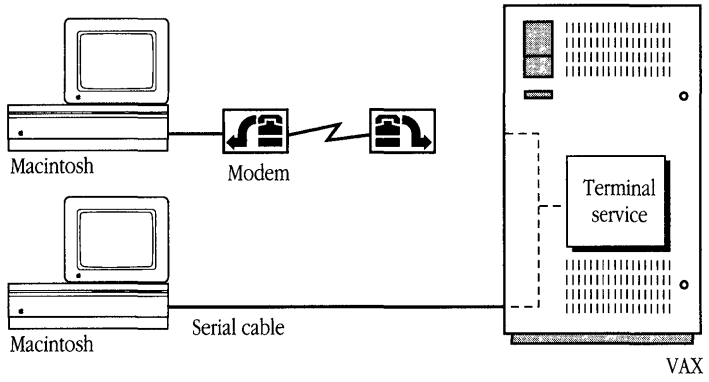


Figure 4-4 Modem and serial connections to a VAX computer

◆ **Note** If the symbols and terminology shown in Figure 4-6 are unfamiliar to you, you may want to read Appendix A, which discusses network terms and concepts. ◆

To use terminal services through a modem or through a direct serial cable connection, you need to configure a MacTerminal session document just as you would with any other type of connection. Instead of choosing a network connection tool (such as the LAT Tool), however, you need to choose and configure either the Apple Modem Tool or the Serial Tool, whichever is appropriate. The *Communications Tools Reference* in the *MacTerminal User's Guide* binder contains reference modules for both of these tools. See the reference modules for details on how to set up these tools.

Connecting to a VAX through a PBX telephone system

If your Macintosh computer is connected to a PBX telephone system, you may be able to connect to a VAX computer through a modem or serial link. The following procedures briefly describe how to connect to a VAX through your PBX telephone and a modem, and through the PBX internal telephone network. If you have trouble, refer to the *PATHWORKS for Macintosh: MacTerminal User's Guide,* which gives much more detailed instructions for establishing modem and serial connections.

To connect through a PBX telephone and modem:

1 **Configure a session document with the following tools:**

- Serial Connection Tool
- VT320 Terminal Emulation Tool

Set the baud rate to match your modem's capabilities and the speed at which the VAX communicates through its modem.

2 **On your PBX telephone, dial the number for the VAX.**

3 **Listen for the carrier signal (the sound of rushing data), then press the Data button on the telephone.**

4 **Choose Open Connection from the Session menu.**

5 **Log in to your VMS account.**

See "Logging In to the VMS Operating System," earlier in this chapter, for details.

To connect through the PBX internal telephone network:

1 **Configure a session document with the following tools:**

- Serial Connection Tool
- VT320 Terminal Emulation Tool

Set the baud rate of the Serial Tool to 19.2 kilobits per second.

2 **Choose Open Connection from the Session menu.**

3 **Enter the appropriate PBX codes to connect to the VAX.**

For example, enter *d* (for directory) and then the address of the VAX that you want, such as *nsdvax*. Ask your PBX administrator for the codes and address if you don't know them.

4 **Log in to your VMS account.**

See "Logging In to the VMS Operating System," earlier in this chapter, for details.

Troubleshooting

If you have trouble logging in or using a terminal service program, the problem may be related to one or more of the tools that you are using. This section gives general troubleshooting suggestions and offers possible solutions for problems that may occur with each type of tool (for more information, see Chapter 7 of the *PATHWORKS for Macintosh: MacTerminal User's Guide*). This section also describes network-related problems in a system software version 7.0 and 6.0.*x* environment.

General suggestions

Check for the following conditions:

- Your connection may not be open. If the Open Connection command on the Session menu is still available (not dimmed), your connection is not open. Choose Open Connection.
- If you are using a modem to communicate with the VAX, your connection may not be functioning properly. Make sure that you are using the correct cables, that the cables and telephone lines are plugged in, and that the modem switches are set correctly.
- Make sure that your communications settings for each tool are correct.
- You may have entered your user name or password incorrectly. Try again. Note that if you enter your password incorrectly too many times in a row (usually five times within several minutes), the system may not allow a log-in to your account, even if you subsequently enter the correct password. (This feature, called *evasion,* guards against attempted break-ins.)
- Your password may have expired. The system administrator may have assigned a time limit for each password that you set—for example, 90 days—so that you must change your password at least that often. If you don't change your password within that period, your password will expire. See your system administrator.
- Log-ins may have been temporarily disabled. For example, the system administrator may be doing maintenance work on the VAX.
- The number of users currently logged in to VMS may have reached the limit set by the system administrator. Try again later.

- Your system administrator may have defined specific times during which you may use the system, such as 9:00 to 5:00, Monday through Friday. Make sure that you are logging in (or accessing an program) at an appropriate time.

Connection tool problems

If one of the scenarios in the following list describes a problem that you're having, your problem could be related to the connection tool that you're using. Try the suggested solution.

LAT Connection Tool

Unable to open the LAT driver. Please reinstall the LAT software.

See if the LAT file is in the correct folder. Before you can select and configure the LAT Connection Tool, your Macintosh computer must have a properly installed Ethernet card that is connected to an Ethernet environment.

No services appear in the Connection Settings dialog box.

If this is the first time you've chosen the LAT Tool, wait a minute or two for your LAT software to listen for available services.

Otherwise, check to make sure you're connected to the right network. First verify that your Macintosh contains a properly installed Ethernet card. If it contains more than one Ethernet card, open the LAT panel (7.0) or the LAT settings in the Control Panel (6.0.*x*) to see which Ethernet card is selected. Choose the network that has the service you want to use.

A LAT service you expected to be available does not appear in the Connection Settings dialog box.

Wait a minute or two. The LAT software updates the list of services from time to time as services announce their availability on the network. If the service still does not appear, check to make sure you're connected to the right network. Open the LAT panel (7.0) or the LAT settings in the Control Panel (6.0.*x*) to see which Ethernet card is selected.

Because the Connection Settings dialog box can list only 100 services, it is possible that no more services can be listed. Otherwise, your system administrator may have removed the service.

A connection to the selected service could not be established.

Make sure you're connected to the right network. First verify that your Macintosh computer contains a properly installed Ethernet card. If your Macintosh contains more than one Ethernet card, open the LAT panel (7.0) or the LAT settings in the Control Panel (6.0.*x*) to see which Ethernet card is selected. Choose the network that has the service you want to use.

Otherwise, the service you've selected may no longer be available. Open the Connection Settings dialog box and select an alternative service.

You are unable to open a connection.

The service you've selected may no longer be available. Open the Connection Settings dialog box and select an alternative service.

You need to specify a password for a protected LAT service.

The service you've chosen is password-protected. Click the OK button and a dialog box appears that allows you to enter the password.

You entered an incorrect password.

You entered an incorrect password for a password-protected LAT service. Click the OK button and a dialog box appears that allows you to reenter the password.

AppleTalk-LAT Connection Tool

The ADSP driver must be version 1.5 or later.

If you're running system software version 6.0.*x*, check to see if the ADSP file is in your System Folder and that it is version 1.5 or later. If you're running system software version 7.0, reinstall your system software.

The zone that you are looking for does not appear in the Connection Settings dialog box.

- Check the physical connection between your Macintosh computer and the network. See the section "Ethernet Troubleshooting Checklist," later in this chapter, for instructions on checking your network.
- If you switched the network connection in the Network panel (7.0) or the network settings in the Control Panel (6.0.*x*) just before you opened the Connection Settings dialog box, the zones listed in the dialog box may not have been updated. Close the Connection Settings dialog box and reopen it to view the zones on the newly selected network.

No gateway list appears in the Connection Settings dialog box.

Make sure you have selected the proper zone in the zones list. If the correct zone is selected and no gateway list appears, check with your system administrator.

No services appear in the Connection Settings dialog box.

If this is the first time you've chosen the AppleTalk-LAT Tool, make sure you have selected an AppleTalk-LAT Gateway. Wait a minute or two for your AppleTalk-LAT Gateway to "listen" for available services.

A LAT service you expected to be available does not appear in the Connection Settings dialog box.

Wait a minute or two. The AppleTalk-LAT Gateway updates the list of services from time to time as services announce their availability on the network. If the service still does not appear, make sure you're connected to the right gateway.

Because the Connection Settings dialog box can list only 100 services, it is possible that no more services can be listed. Another possibility is that your system administrator has removed the service.

A connection to the selected service could not be established.

Make sure that the AppleTalk-LAT Gateway is still selected in the Connection Settings dialog box. Also make sure that the service you've selected is still in the list of services offered by that gateway. If it is not, the service you've selected may no longer be available. Select an alternative service in the Connection Settings dialog box.

A connection to the selected gateway could not be established.

Make sure that the AppleTalk-LAT Gateway is still selected in the Connection Settings dialog box. Another possibility is that there is a limit to the number of connections that can be established on the gateway. Try again or contact your system administrator.

CTERM Connection Tool

A DECnet host you expected to be available does not appear in the Connection Settings dialog box.

Make sure that the DECnet software is properly installed on your network. The node is probably not defined in the DECnet database on your Macintosh. Use NCP to define it. (For more information about NCP, refer to the *Using DECnet for Macintosh* part of this binder.)

You cannot connect to a known service.

The service may be unavailable at the moment. See your system administrator.

Serial or Modem Connection Tool

You are using a serial connection or a modem to communicate with the VAX computer, and characters are lost during transmission despite correct communications settings.

Try reducing the baud rate or changing the handshaking protocol. Choose Connection from the Settings menu and experiment with communications settings. Use the Modem or Serial Tool to change the baud rate on your Macintosh computer. The setting for the VAX computer may have to be adjusted accordingly. You can make temporary changes to the

settings; permanent changes must be made by the system administrator. To change the baud rate on the VAX, use this DCL command:

```
$ SET TERMINAL/SPEED
```

With a modem connection, "noise" or static on the telephone lines can cause characters to be dropped. If you think that there is too much noise on the line, try closing the connection and then reopening it to establish a better connection.

Terminal emulation tool problems

If one of the scenarios in the following list describes a problem that you're having, your problem could be related to the terminal emulation tool that you're using. Try the suggested solution.

You are using a serial connection or modem to communicate with the VAX, and no data is being sent or received.

Choose Terminal from the Settings menu, and make sure that the On Line option is checked in the Terminal Emulation dialog box. Also, make sure that your cables are hooked up properly and that your connection is properly configured.

Nothing appears on the screen when you send data.

Choose Terminal from the Settings menu, and put a check mark by the Local Echo option in the Terminal Emulation dialog box.

The characters that you type appear as double characters.

Choose Terminal from the Settings menu and uncheck the Local Echo option in the Terminal Emulation dialog box.

The characters that you enter do not appear on the screen, and your Macintosh beeps with each keystroke.

The keyboard is locked.

- If you are using the VT102 Tool, choose the No Scroll command from the Keys menu. Or try pressing Control-Q.
- If you are using the VT320 Tool, choose Hold Screen from the Keys menu. Or try pressing Control-Q.

If the No Scroll or Hold Screen command is not available and Control-Q does not work, make sure that the XON/XOFF handshake protocol is selected in the connection tool that you're using for the session.

Incoming data writes over the last character on the first line.

Choose Terminal from the Settings menu. In the Terminal Emulation dialog box, put a check mark by the Auto Wrap to Next Line option or by the New Line on a Return option.

Lines of incoming data are double-spaced.

Choose Terminal from the Settings menu. In the Terminal Emulation dialog box, remove the check from the New Line on a Return option.

Incoming characters disappear off the edge of the screen.

Choose Terminal from the Settings menu. In the Terminal Emulation dialog box, put a check mark by the Auto Wrap to Next Line option.

Incoming data writes over the same line.

Choose Terminal from the Settings menu. In the Terminal Emulation dialog box, put a check mark by the New Line on a Return option.

The cursor is not visible on the screen.

The cursor may have been scrolled out of the part of the screen that you can see. Click in the active scroll bar to scroll the cursor back to the area that you can see.

The terminal is displaying unexpected characters (for example, graphics characters or characters from a non-U.S. ASCII character set).

Choose Terminal from the Settings menu. Select the character set icon. Make sure that the active character set is G0 and that U.S. ASCII is designated as the G0 character set. For more information, see the *PATHWORKS for Macintosh: MacTerminal User's Guide.*

The terminal is echoing unrecognizable characters.

The terminal may be in the wrong mode. Choose Terminal from the Settings menu. The Terminal Settings dialog box appears, displaying the General options. Confirm that the Terminal Mode option is set to VT320 in an 8-bit environment, or is set to ANSI/VT100 in a 7-bit environment. *You may also see unexpected characters when you are communicating over a noisy phone line.*

File-transfer tool problems

If one of the scenarios in the following list describes a problem that you're having, your problem could be related to the file-transfer tool that you're using. Try the suggested solution.

You are having trouble sending files.

Check that the VAX computer supports the error-checking method that you've specified. For example, with the XMODEM Tool, examine the Transfer Options by choosing File Transfer from the Settings menu.

Incoming characters disappear off the edge of the screen.

Choose File Transfer from the Settings menu. In the File Transfer dialog box, put a check mark by the Auto Wrap to Next Line option.

Data is lost during file transfers with the Text File Transfer Tool.

Choose File Transfer from the Settings menu. In the File Transfer dialog box, increase the delay-per-line or the delay-per-character. When you use the Text Tool, you can also try changing the handshaking protocol. If that doesn't work, try reducing the baud rate.

Network-related problems in version 7.0

The following conditions may occur if your Macintosh computer is running version 7.0. If one of the scenarios in the list describes a problem that you're having, it could be related to the network hardware or software that you're using.

The LAT or Network panel is missing from the Control Panels folder.

In this case, one of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The LAT or Network panel has been moved from the Control Panels folder. You must either reinstall the LAT software or the EtherTalk 2.0 software. To reinstall LAT, refer to the *Installation* part of this binder. To reinstall EtherTalk 2.0, refer to the documenta-tion for the Ethernet card that you are using.

You can't select the LAT or Network panel in the Control Panels folder. A message appears, advising you that the network package has not been installed correctly.

The LAT or EtherTalk 2.0 software has not been installed properly on your startup disk. To reinstall LAT, refer to the *Installation* part of this binder. To reinstall EtherTalk 2.0, refer to the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear after you open the LAT or Network panel.

One of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from the Extensions folder in your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- There is no Ethernet card in your Macintosh computer, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear when you open the Network panel.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.
- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the Extensions folder in your System Folder and drag it to the Trash.

You can't select the EtherTalk icon in the Network panel. A message appears advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh computer with an EtherTalk startup disk or the disk that you used is damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Network panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all programs and try switching the network connection again. If you still can't switch network connections and you don't mind disrupting services that your computer provides or is using, shut down your computer. Then restart, using a startup disk that permits network-connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start your computer. The computer can hang if it is not correctly connected to the Ethernet cable or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

The Connection Settings dialog box does not list any network services or does not list the service that you want.

- If no network services appear, check the physical connection between your Macintosh and the network. See how to check your network in the section "Ethernet Trouble-shooting Checklist" later in this chapter.
- If you switched the network connection in the Network panel just before you opened the Connection Settings dialog box, the services listed in the dialog box may not have been updated. Close the Connection Settings dialog box and reopen it to view the services on the newly selected network.

Network-related problems in version 6.0.*x*

The following conditions may occur if your Macintosh computer is running version 6.0.*x*. If one of the scenarios in the list describes a problem that you're having, it could be related to the network hardware or software that you're using.

The Control Panel is missing.

The Control Panel is present on all startup disks unless you have removed it with the Font/DA Mover. If you're using more than one startup disk, your Macintosh may switch to a disk without the Control Panel installed. The icon of the current startup disk is in the upper-right corner of the desktop.

Use the Installer program from the *System Tools* disk (version 6.0.4 or later) to update your System file. The Installer automatically reinstalls the Control Panel.

The LAT or Network icon is missing from the Control Panel.

In this case, one of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.

- The LAT or Network icon has been moved from your System Folder. You must reinstall the LAT or EtherTalk 2.0 software. To reinstall LAT, refer to the *Installation* part of this binder. To reinstall EtherTalk 2.0, refer to the documentation for the Ethernet card that you are using.
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or later. (The version number appears in the lower-left corner of the Control Panel). Use the Installer program from the *System Tools* disk (version 6.0.4 or later) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the LAT or Network icon in the Control Panel. A message appears, advising you that the network package has not been installed correctly.

The LAT or EtherTalk 2.0 software has not been installed properly on your startup disk. To reinstall LAT, refer to the *Installation* part of this binder. To reinstall EtherTalk 2.0, refer to the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear in the Control Panel after you click the Network icon.

One of the following conditions exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- There is no Ethernet card in your Macintosh computer, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear in the Control Panel when you click the Network icon.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.

- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the System Folder and drag it to the trash.

You can't select the EtherTalk icon in the Network Control Panel. A message appears you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh computer with an EtherTalk startup disk or the disk that you used is damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Network Control Panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all application programs and try switching the network connection again. If you still can't switch network connections, and you don't mind disrupting services that your computer provides or is using, shut down your Macintosh. Then restart your computer, using a startup disk that permits network-connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start your computer. The computer can hang if it is not correctly connected to the Ethernet cable or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

The Connection Settings dialog box does not list any network services or does not list the service that you want.

- If no network services appear, check the physical connection between your Macintosh and the network. See how to check your network in the section "Ethernet Troubleshooting Checklist" later in this chapter.
- If you switched the network connection in the Network control panel (described earlier in this chapter) just before you opened the Connection Settings dialog box, the services listed in the dialog box may not have been updated. Close the Connection Settings dialog box and reopen it to view the services on the newly selected network.

Ethernet troubleshooting checklist

Here's a checklist to consult whenever you're having trouble with Ethernet:

- Are all cables secure?
  Make sure that the network cable to your Ethernet card is secure at all connections. Also check the network cable to the service that you're trying to use. Contact your system administrator if you are uncertain about cable configuration.
- Is the problem really related to the network?
  Sometimes a problem that seems to be related to the network is actually related to the device or application program that you're using. The manual for the device or program may be helpful.
- Is your Ethernet card installed and set correctly?
  Shut down your Macintosh computer and make sure that the Ethernet card is firmly seated in its slot. Also, make sure that any jumpers and switches are set properly. See the documentation for your Ethernet card.
- Is the program that you want to use available on your network?
  If there is more than one network to which you can connect, you need to select the proper network connection. For instructions, see "Selecting a Network Connection," earlier in this module.

5 MacX and DECwindows Programs

This chapter introduces the MacX application program, a component of PATHWORKS for Macintosh that lets you access DECwindows application programs running on VAX computers. The MacX program is an implementation of the **X Window System** for Macintosh computers.

This chapter explains basic concepts relating to MacX and the X Window System. It also tells you how to start MacX and run DECwindows programs by using the **AppleTalk-DECnet Connection Tool.** For detailed information on the X Window System and MacX, read the *PATHWORKS for Macintosh: MacX User's Guide.* If you are using a connection tool other than the AppleTalk-DECnet Connection Tool to establish a connection with the DECwindows environment, see the *Connection Tools Reference* in the *MacX User's Guide.* If you encounter problems as you work with MacX, see Chapter 6, "Troubleshooting," in the *MacX User's Guide.*

Overview of MacX

The MacX program is Apple Computer's implementation of the X Window System for the Macintosh computer. To understand MacX, it's helpful to know a little about the X Window System—called *X* for short.

This section briefly describes the X Window System and MacX. It also outlines the basic procedure that you follow to use MacX. (The subsequent sections of this chapter give more detailed instructions.)

The X Window System and MacX

The X Window System was developed by the Massachusetts Institute of Technology and an association of computer companies to provide a powerful, flexible computing environment for network workstations. X allows users to access applications, often called *clients,* and use them through windows that look very much like Macintosh windows. These windows are created by the **X server,** which runs locally on the user's workstation.

◆ **Note** To users familiar with typical server/client relationships on a network—where the server resides on a remote computer and the workstation is regarded as the client—this arrangement may seem backward. In an X environment, its best to think of the server software as "serving up" X clients to the user. The *PATHWORKS for Macintosh: MacX User's Guide* explains the X server/client relationship in detail. ◆

Although clients can run locally on a workstation, in most cases they run on remote host computers and are accessed over a network. The clients that you use with the MacX program, for example, run on VAX computers. X ensures that the applications function smoothly and reliably, as if the clients were running locally.

MacX supplies the X server for your X environment. The clients to which it provides access are called *DECwindows programs*. DECwindows is Digital Equipment Corporation's implementation of the X Window System for VAX computers. DECwindows runs under both the VMS and the **ULTRIX**™ operating systems.

You can use three different connection tools to access DECwindows programs:

- the AppleTalk-DECnet Connection Tool, for a connection through the AppleTalk/DECnet Transport Gateway
- the MacTCP Connection Tool, for a TCP/IP connection
- a DECnet connection tool, for a DECnet connection

MacX is preset to use the AppleTalk-DECnet Connection Tool. Depending on your situation, however, you may want to use one of the other tools. For more information about the connection tools that you can use with MacX, see the *Connection Tools Reference* of the *PATHWORKS for Macintosh: MacX User's Guide*. The *AppleTalk-DECnet Connection Tool* reference module in that guide's *Connection Tools Reference* provides information about the AppleTalk/DECnet Transport Gateway and the AppleTalk-DECnet Tool.

Figure 5-1 shows the software and hardware components of an X environment implemented on an Apple and a Digital network—including the MacX server, MacX support files, communications tools, and DECwindows programs (clients). In this sample network, the AppleTalk-DECnet Connection Tool is used to create the connection between the Macintosh computer and the Digital network. (Note that the software components can be found in the folders indicated in this figure only if the Macintosh is running system software version 7.0; to find out where these components are installed in a version 6.0.x environment, see the section "Where the Software Is Located" in the *Installation* part of this guide.)

◆ **Note** If the symbols and terminology shown in Figure 5-1 are unfamiliar to you, you may want to read Appendix A, which discusses network terms and concepts. ◆

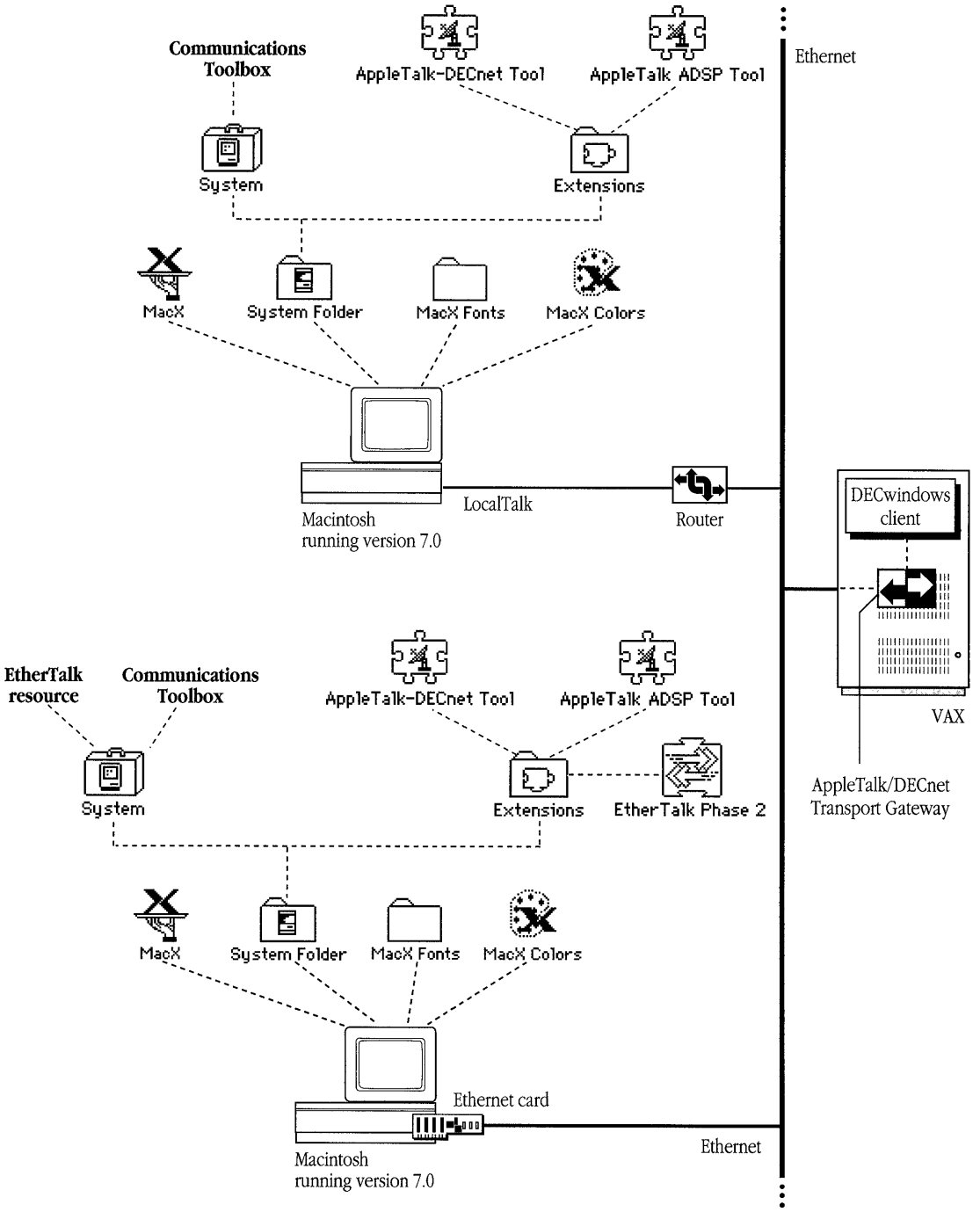


Figure 5-1 Network components of a MacX environment

Using windows

The MacX program displays each DECwindows program that you open in its own window. In effect, MacX converts your screen into a number of miniature screens so that you can perform many activities rather than just one at a time. You can move, resize, and stack these windows, as well as reduce them to icons—a convenient way to set aside windows without closing the applications in them. Each application can also create its own windows. The application controls how they are manipulated, and its windows remain within the boundaries of the application's window.

MacX offers two different ways to display windows: rooted and rootless. To conform with the traditional X environment, MacX creates a **root window.** The root window acts as a "desktop" upon which the other windows are displayed. The windows operate according to a hierarchy, with the root window at the top. At the second level are the windows that appear when a user starts up client applications. At the third level are windows created and controlled by the clients. (MacX actually creates two root windows—one for color clients and one for black-and-white clients. See the *PATHWORKS for Macintosh: MacX User's Guide* for more information.)

Figure 5-2 shows a typical black-and-white MacX root window with two client applications open. The Calculator and Clock clients are displayed in second-level windows. The keys on the Calculator are third-level windows, created by the Calculator application.

By using a menu command, the MacX user can choose to hide or show the root window. Because the root window is at the top level of the window hierarchy, hiding the root window makes all of the second- and third-level windows invisible as well. Working in this manner, with a root window at the top of the window hierarchy, is known as the **rooted** style of operation.

MacX, however, also takes advantage of the Macintosh computer's existing, sophisticated graphical interface. MacX can display X clients in standard Macintosh windows, independent of the root window. Working in this manner is known as the **rootless** style of operation. When you work in the rootless style, the top level of the window hierarchy comprises the windows that appear when you start up client applications. At the second level are windows created and controlled by the clients.

Figure 5-3 shows client applications open in rootless style.

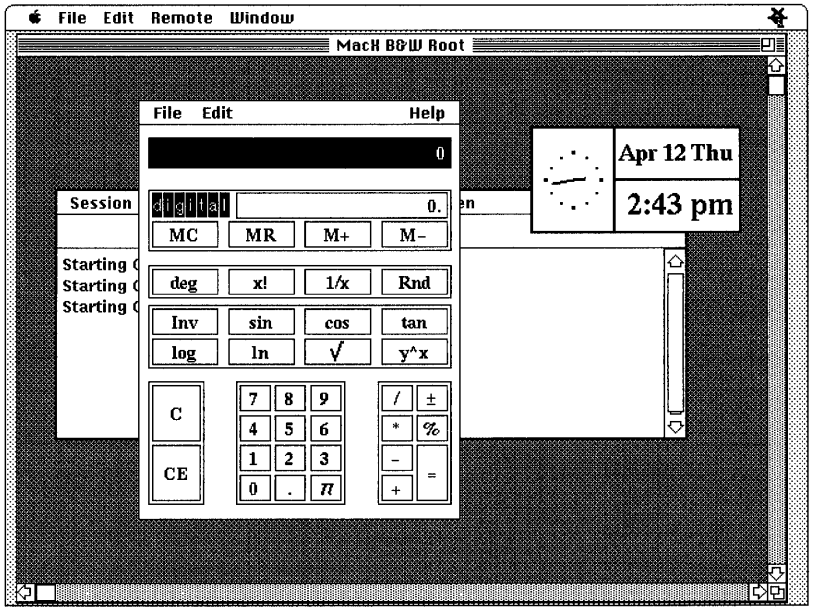


Figure 5-2 MacX windows in rooted style

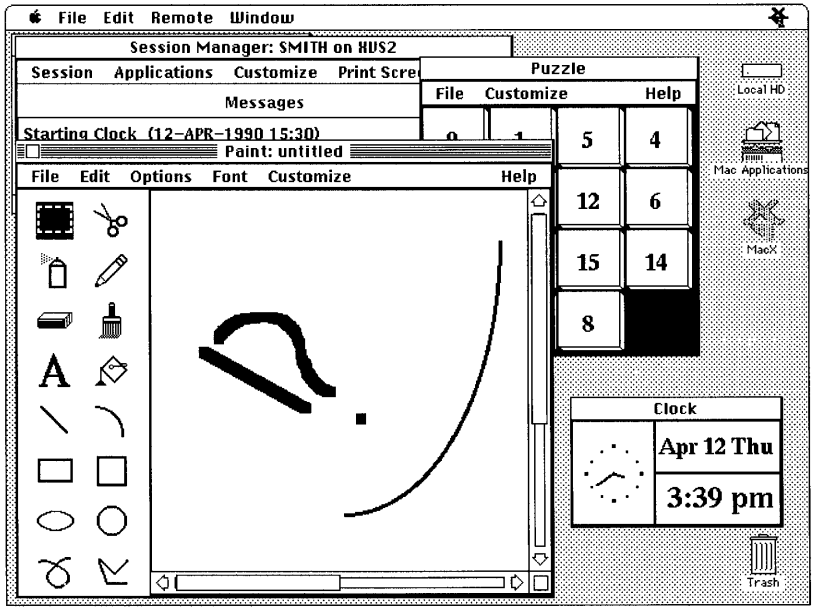


Figure 5-3 MacX windows in rootless style

For each DECwindows program that you start, MacX offers you the choice of working in rootless or rooted style. If you want to, you can specify the rooted style when you start a DECwindows program, as described later in this chapter. If you are familiar with the traditional X environment, you may be more comfortable working in the rooted style. You may also want to specify the rooted style if you want the convenience of hiding all of the client application windows by simply hiding the root window.

Clients that you open in the rootless style are managed by the MacX Window Manager, which runs on your Macintosh computer. It is the MacX Window Manager that lets you move windows, resize them, and so on. If you open a client in the rooted style, the window management functions for that client are handled by a remote **window manager** such as the DECwindows Window Manager.

Basic procedure for using MacX

This section briefly describes how to access DECwindows programs through the AppleTalk/DECnet Transport Gateway. Detailed instructions are given in the sections that follow.

First, you must specify the gateway through which you want to connect to DECwindows programs. (If your Macintosh computer is connected to more than one network, you must also select the network that you want to access.)

Then you start the **Session Manager,** a DECwindows program that lets you perform these tasks:

- Customize your working environment.
- Print the contents of a display screen.
- Access the VMS operating system by using DECterm, a terminal emulator. (Note that you can also log in to VMS by using MacTerminal, as described in Chapter 4.)
- Run other DECwindows programs.

You start the Session Manager by creating a remote command in the New Remote Command dialog box. A **remote command** is an instruction that starts an X client on a VAX computer.

The way that you define your remote command becomes part of your **settings document.** MacX always opens a new settings document when it starts up. The settings document stores the details of the working environment that you set up—every remote command that you create, every preference that you specify, and so forth. When you quit, MacX prompts you to name and save your settings document. If you save the settings document, then you can return to that environment whenever you like by double-clicking the document's icon.

A sample settings document called DECwindows Sample is supplied with MacX. This settings document contains a number of typical remote commands. To see these commands, double-click the icon for DECwindows Sample, shown at left. When the DECwindows Sample session document is open, the sample remote commands are listed at the bottom of the Remote menu. Choose a command while holding the Option key to open the Remote Command dialog box for that command.

Settings documents let you customize environments for different hosts, clients, types of tasks, or working styles. For example, you could create an environment for doing budgets—in which a spreadsheet client automatically opens in the middle of your screen and a calculator appears in the upper-right corner—and save it in a settings document called Budget.

Once you have started the Session Manager, you can access other DECwindows programs. You can use several different methods to start an application:

- You can choose the application's name from the Session Manager's Applications menu.
- You can choose the application's name from the FileView Applications menu. (**FileView** is an application that lets you see the files and directories on a VAX computer. The DECwindows Session Manager is preset to start FileView automatically.)
- You can issue another remote command.
- You can start DECterm and issue Digital Command Language (DCL) commands.

This chapter tells you how to start an application by using the Applications menu displayed by the Session Manager or FileView. For information on the other methods, see the PATHWORKS for Macintosh: MacX User's Guide. For details on using DCL commands and interacting with the VMS operating system, see the VMS User's Manual.

Starting MacX

To start the MacX program, double-click the MacX icon (shown at left) or click the icon once and choose Open from the File menu.

After you start MacX, your desktop should look similar to the one shown in Figure 5-4. You should see the four MacX menu headings in the menu bar at the top of your screen. If MultiFinder is active, you'll also see the MacX icon at the far right, and the icons and windows on your desktop. (For an explanation of the menus, see the *PATHWORKS for Macintosh: MacX User's Guide.*)

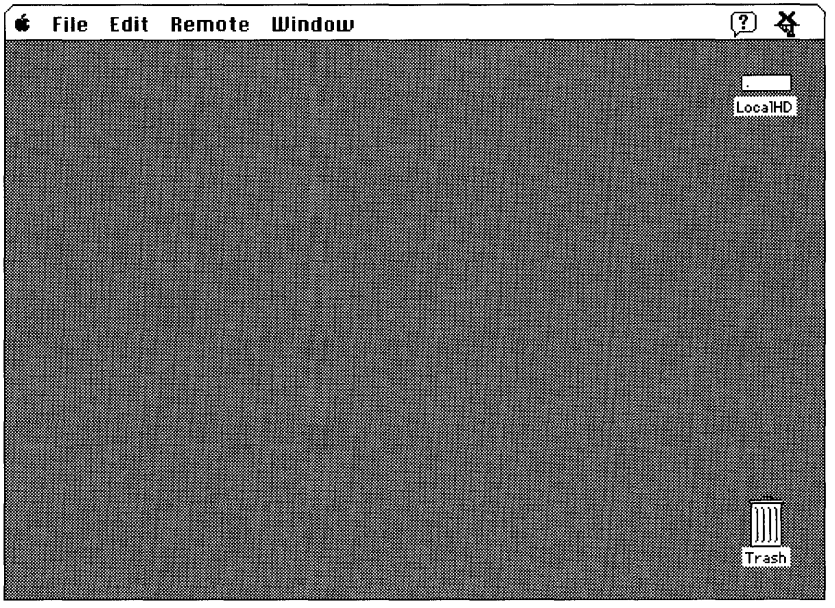


Figure 5-4 The MacX desktop

Although you don't see a window for it, MacX creates a new settings document to store the settings for your working environment.

If your Macintosh computer is connected to more than one network, the next step is to select a network as described in the next section. If your Macintosh is connected to a single network, skip to "Starting the Session Manager."

Selecting a network connection

Your Macintosh computer may be connected to more than one network, or you may have two or more connections to the same network. For example, your computer may be connected to a LocalTalk network and also contain an Ethernet card that connects it directly to an Ethernet environment. Or it may contain multiple Ethernet cards, each card connecting it to a different Ethernet environment. If you have multiple network connections, you must specify which connection you want to use.

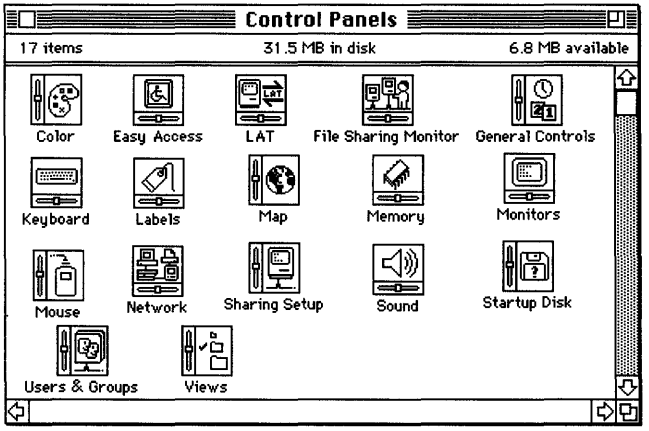
The process of selecting a network connection differs somewhat for Macintosh computers running version 7.0 and those running version 6.0.*x*. This section includes procedures for each environment.

Selecting a network connection in version 7.0

To select a network connection on a Macintosh computer running version 7.0:

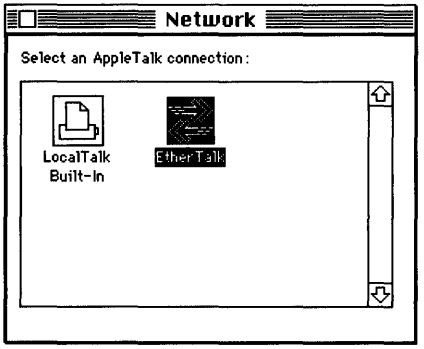
1 **Choose Control Panels from the Apple (🍎) menu.**

The Control Panels window appears. Each control panel has its own icon and can be opened like the icon for a program or a document.



2 **Double-click the Network control panel icon.**

The Network panel appears.



3 **Select the icon for the network connection that you want to use.**

The Network panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label LocalTalk Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh computer is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

4 **Close the Network panel.**

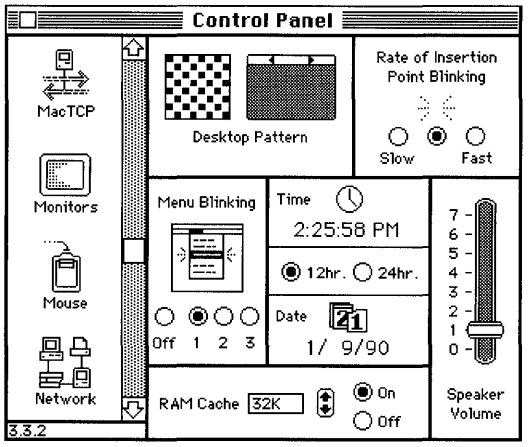
5 **Close the Control Panels window.**

Selecting a network connection in version 6.0.x

To select a network connection on a Macintosh computer running version 6.0.x:

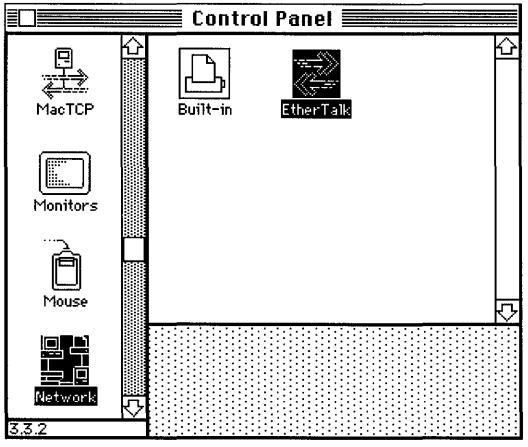
1 **Choose Control Panel from the Apple (🍎) menu.**

The Control Panel dialog box appears.



2 **Select the Network icon from the group of icons on the left side of the Control Panel dialog box.**

You may have to scroll through the list to find the Network icon.



3 **Select the icon for the network connection that you want to use.**

The Control Panel displays a separate icon for each network to which your Macintosh computer is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection is shown in the preceding figure with the label Built-in.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh computer is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot that contains the Ethernet card for that connection.

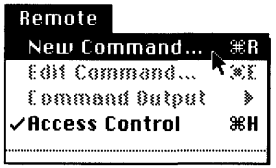
4 **Close the Control Panel dialog box.**

Starting the Session Manager

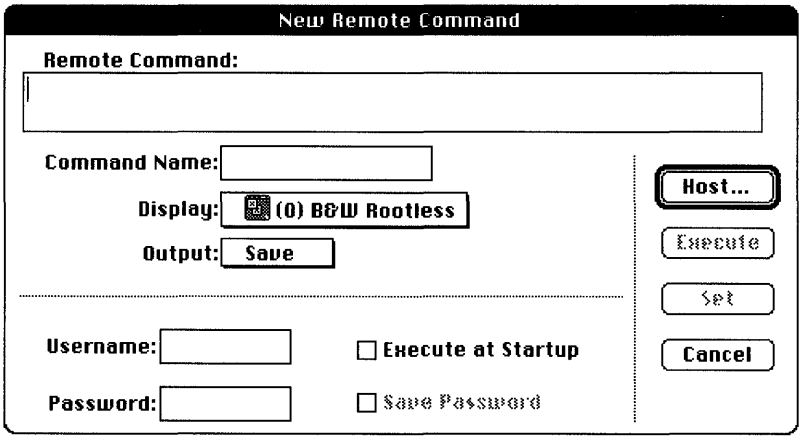
This section tells you how to create a remote command to start the DECwindows Session Manager through an AppleTalk to DECnet connection. In the Remote Command dialog box, you also set certain options and specify the host computer, and a connection method.

To start the Session Manager:

1 **Choose New Command from the Remote menu or press Command-R.**

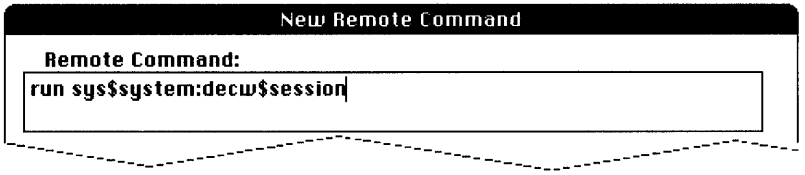


The New Remote Command dialog box appears.



2 **Enter the command to start the Session Manager.**

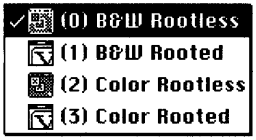
Type the command `run sys$system:decw$session` in the Remote Command field.



3 Fill in the rest of the New Remote Command dialog box.

Command Name: Enter an abbreviated name for your command. This name will appear at the bottom of the Remote menu so that you can choose it in future sessions when you want to execute the command. The name will also appear in the Edit Remote Command dialog box and in the Command Output submenus so that you can edit the command or view command output.

Display: This pop-up menu contains a list of the four types of screens on which you can display your remote command. (On monochrome systems, only the first two types of screens appear in the menu.)



Choose the style (rooted or rootless) in which you want to use MacX. (See Chapter 3 in the *PATHWORKS for Macintosh: MacX User's Guide* for details.)

Output: Select Save or Notify from the Output pop-up menu to retain any system or error messages generated if the command doesn't work or gets interrupted by a problem with the host or the network.

If you choose the Notify command, the Macintosh computer beeps and a small, flashing MacX icon appears at the left end of the menu bar when the MacX program receives output from the host. See Chapter 3 in the *PATHWORKS for Macintosh: MacX User's Guide* for an explanation of the other output options.

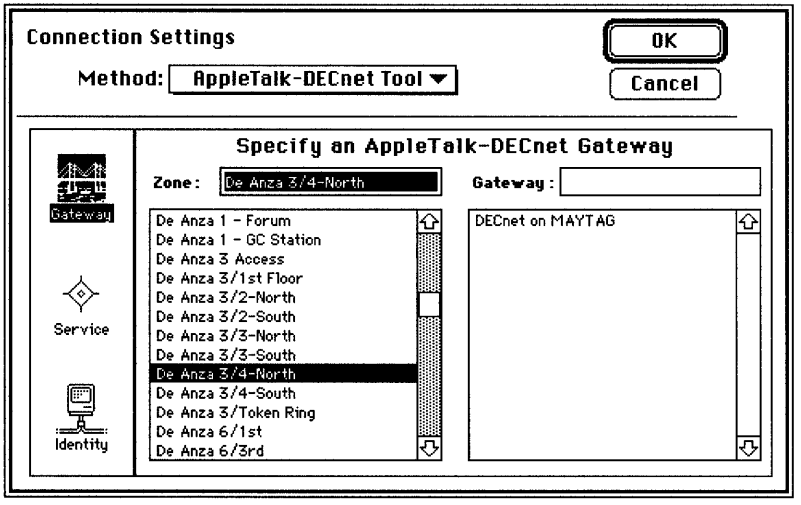
Username: Enter the user name assigned to you by your system administrator.

Password: Enter the password assigned to you by your system administrator. Each character that you type appears as a dimmed, gray box for security.

Execute at Startup: Select this box to have the Session Manager start automatically in the future whenever you open your MacX settings document. (You can bypass this option later by holding down the Option key while MacX is starting up. After the MacX startup window disappears, you release the key and no Session Manager window will appear.)

Save Password: This checkbox should be dimmed. If it's not, leave it deselected for now. For more information, see Chapter 3 in the *PATHWORKS for Macintosh: MacX User's Guide.*

Host: Click the Host button to display the Connection Settings dialog box as shown in the following figure:

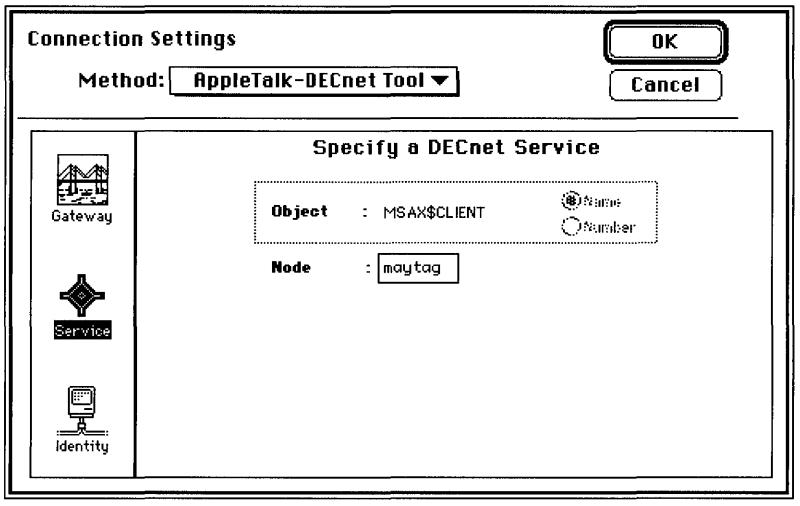


The Method pop-up menu, at the upper-left corner of the dialog box, contains a list of connection tools that allow you to use DECwindows programs. If it's not already displayed, select the AppleTalk-DECnet Tool.

The available zones are listed at the left side of the dialog box. Select the zone containing the AppleTalk-DECnet Gateway that you want to use. The zone that you select appears in the Zone text field.

The available gateways for a particular zone are listed at the right side of the dialog box. Select the AppleTalk-DECnet Gateway that you want to use. The gateway that you select appears in the Gateway text field.

Select the Service icon from the group of icons at the far left side of the dialog box. A new Connection Settings dialog box is displayed, as shown in the following figure, that allows you to specify a DECnet service.



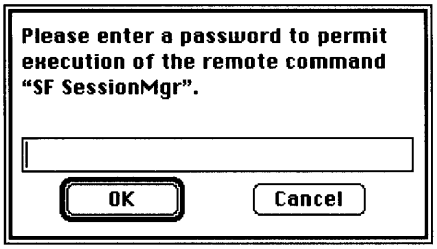
In the Node text field, enter the node name of the VAX computer running the DECwindows programs that you want to use. Ask your system administrator for the node name if you don't know it.

4 **Click the OK button.**

The Connection Settings dialog box disappears.

5 **In the New Remote Command dialog box, click the Execute button or press the Return or Enter key to execute your command.**

You might be asked to supply your VMS password, as shown in the following figure.

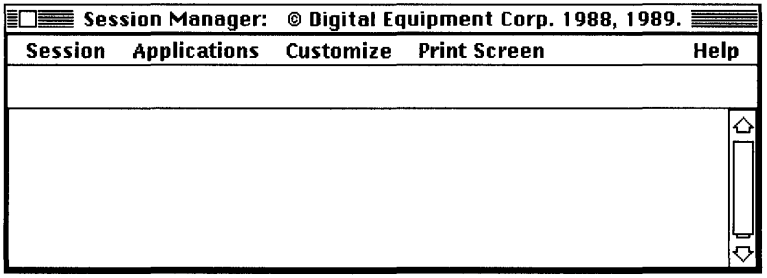


After a brief pause, MacX may display the alert box shown in the next figure. If this optional security measure is active, the alert appears in response to any attempt to connect with your MacX server. It prevents someone from accessing MacX from another terminal without your knowledge or approval.

6 **Because this warning has appeared at this time in response to your own remote command, click the OK button.**

This first alert signals a test connection that MacX sets up to make sure that everything is working correctly. A few moments later, you'll get a second, identical alert signaling you that the DECwindows program is establishing a permanent connection for your session.

Within a few moments, a Session Manager window similar to the one shown here appears on your screen.



Because the Session Manager is usually configured to open the FileView application automatically, a third alert will probably appear, indicating that FileView is attempting to attach to your server. FileView is a graphical interface to the VMS operating system. (You can select other applications to start up automatically with the Session Manager by using the Autostart command in the Customize menu. See the *VMS DECwindows User's Guide* for details.)

If nothing appears after a minute or so, you may have made an error typing the command, your user name, or your password. Open the Remote Command dialog box and make sure these items are correct.

For other types of problems, such as network malfunctions, alert boxes will appear on your screen to inform you of the type of error. See Chapter 6 of the *PATHWORKS for Macintosh: MacX User's Guide* if you need more help.

Running DECwindows programs

You can always start an application program from the Remote Command dialog box, just as you started the Session Manager. However, the Session Manager and FileView provide simpler methods.

The Session Manager lets you start another DECwindows program by choosing its name from the Applications menu. You can use the same method from FileView, which contains a similar menu. Figure 5-5 shows the Session Manager window with the Applications menu pulled down and the Calculator application program chosen.

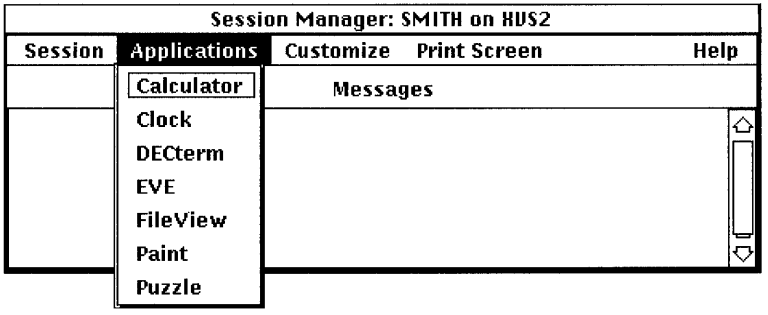


Figure 5-5 Starting an application from the Session Manager

In both the Session Manager and FileView, you may need to customize the Applications menu if the menu does not contain the names of the application program that you want to run. You can add names to the Applications menu by using commands in the Customize menu. The *VMS DECwindows User's Guide* gives details on customizing the Session Manager, FileView application program, and other parts of your DECwindows environment.

You can also start applications from the DECterm terminal emulator. See the *PATHWORKS for Macintosh: MacX User's Guide.*

Quitting DECwindows programs

All DECwindows programs have a Quit or Exit command available from one of their menus, usually the File menu. You should always close a DECwindows program by saving your files and then choosing the Quit or Exit command, so that you don't lose any of the work that you have done. If you are using DECterm, you should log out of the VMS operating system before you quit.

Do not use the Kill Client command; it is designed to disconnect clients, such as most standard X clients, that do not have a Quit or Exit command. Using Kill Client could mean losing the unsaved data with which you were working.

For more information, see the *PATHWORKS for Macintosh: MacX User's Guide.*

Quitting MacX

This section gives the procedure for quitting the MacX program.

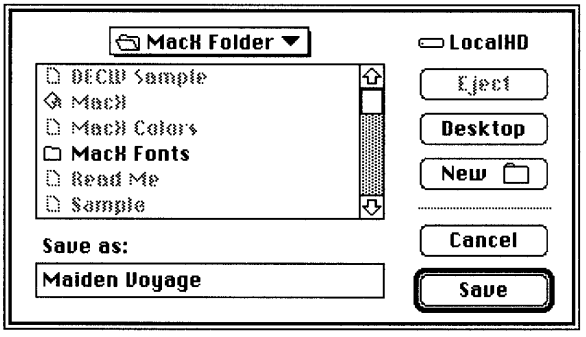
To quit MacX:

1 **Quit the DECwindows programs that you are using.**

If you're using DECterm, first log out of the VMS operating system so that you don't lose any work that you've done.

2 **Choose Save As from the File menu.**

The Save As dialog box appears.



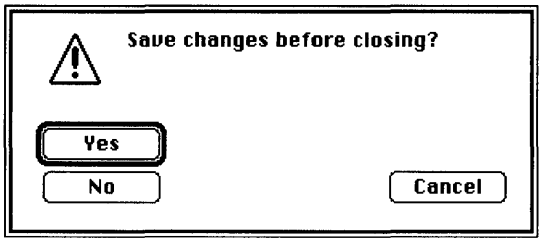
As discussed earlier in this chapter, MacX has created a settings document to preserve your remote command and the rest of your X environment. Unless you save the settings document, MacX will discard your settings information.

3 **Name your settings document.**

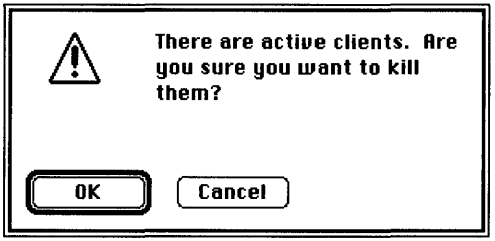
The document is currently labeled *Untitled*. Enter another name in the highlighted field and either press the Return key or click the Save button. (The preceding figure shows the name *Maiden Voyage* entered in this field.) MacX creates a document icon labeled with the name that you entered. Later, you can double-click the icon and return to the same environment that you just created.

4 **Choose Quit from the File menu or press Command-Q to exit from MacX.**

Should you forget to save your document before quitting, MacX will display an alert box asking whether you want to save your changes. Click the Yes button to display the Save As dialog box, and fill it in as described in the preceding step.



If DECwindows programs are still running when you quit MacX, the following alert box appears.



Since clicking OK abruptly disconnects all applications and jeopardizes any unsaved work, you should not quit in this way. Instead, click Cancel. Quit the DECwindows programs as described in the preceding section, and then quit MacX again.

Mouse and keyboard differences

This section describes the differences between the Macintosh mouse and keyboard and the standard mouse and keyboard designed for the X Window System.

Mouse differences

Mouse devices designed by Digital have three buttons, whereas the Macintosh mouse has one. DECwindows programs assume that you are using a three-button mouse, so you must use the arrow keys as substitutes for the other two buttons, as shown in Figure 5-6.

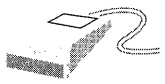
Macintosh key	MacX function
	Left mouse button
	Middle mouse button
	Right mouse button
	Meta modifier (mod1)
	Control key

Figure 5-6 Substitute mouse buttons

To use the arrow keys for their normal purpose, hold down the Option key before pressing one of them.

If you would rather reverse this procedure—that is, press the Option key together with an arrow key to get the extra mouse buttons—you can select the Option + Arrow Keys button in the Miscellaneous Preferences window, as shown at the top of Figure 5-7.

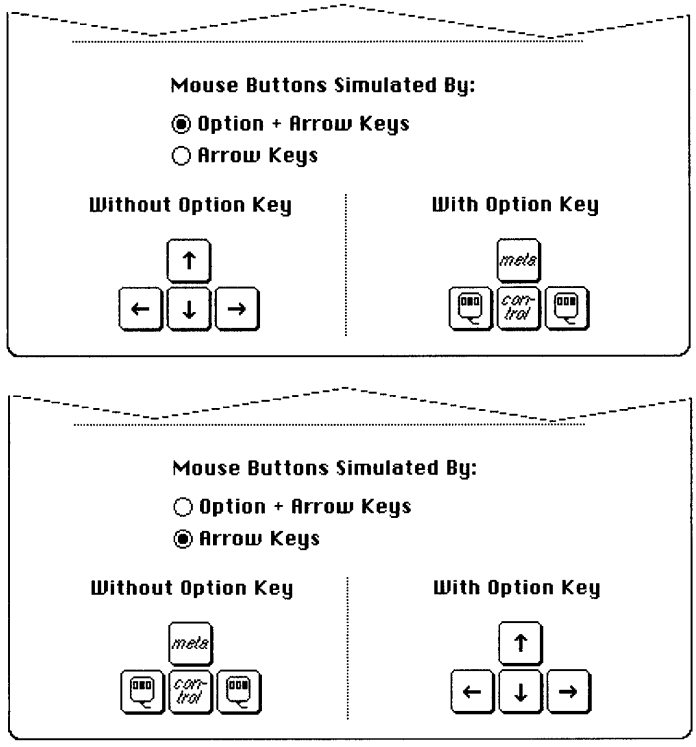


Figure 5-7 The arrow keys preference option

You'll find Miscellaneous Preferences at the end of the Edit menu.

Keyboard differences

The Macintosh Plus keyboard has no Control key, so you must use the Command key (⌘) instead. As a result, while MacX is running, you cannot use Command-key combinations as shortcuts for menu commands (such as ⌘-X for Cut and ⌘-V for Paste).

6 Data Access Language

This chapter introduces Data Access Language (DAL), a connectivity language that some of your desktop application programs may use to access data stored in databases on VAX computers.

This chapter presents an overview of Data Access Language. It describes preferences files, called hosts.cl1 and DAL Preferences, that tell the DAL software on your Macintosh computer how to connect to a VAX computer. It also describes tools that verify that DAL software is properly installed on your Macintosh.

Note that this chapter presents overview information only. If you want detailed information about how to configure these preferences files and use the tools, refer to the *PATHWORKS for Macintosh: Client Administrator's Guide.* If you are a technical user who wants to write DAL programs, refer to the *PATHWORKS for Macintosh: Data Access Language Programmer's Reference.*

Overview of Data Access Language

Data Access Language is composed of a standard connectivity language and a set of supporting software components that simplify the linking of desktop application programs to host data. Macintosh programs, such as word processors, query tools, or spreadsheets use Data Access Language to access, manipulate, and update data stored in relational databases on VAX computers. A program that uses Data Access Language can interact with host data in a uniform way—regardless of the particular host manufacturer, operating system, database management system (DBMS), or network connection.

During a DAL session, various DAL components work together to give the program access to the host data it needs. The following steps illustrate this process during a typical session. This example assumes that the spreadsheet developer has incorporated DAL support in the product.

1. You need to incorporate data from a VAX database into a spreadsheet. Using the menus of the spreadsheet program, you indicate that you will be using Data Access Language for host data access.
2. The spreadsheet program uses the DAL Application Program Interface (API), the program's point of contact with Data Access Language, to connect to the DAL servers. These servers are located on the host systems. Typically the DAL API would use a default DAL server, but the spreadsheet program might ask you to select from a list of servers.
3. You indicate that the needed data resides on a VAX computer. The spreadsheet asks Data Access Language to open connections to DAL servers on the target VAX.

4. The spreadsheet uses DAL statements to request a list of available databases on the VAX computer and displays the lists for your selection. In addition, it displays the data items available. You select the needed data items, perhaps indicating that the data should be sorted, from spreadsheet lists and dialogs. You may also specify row selection criteria that select only certain rows from the databases.
5. After you have identified the selection criteria for the required data, the spreadsheet sends a DAL query to the DAL server, which forwards it to the VAX computer for execution. The result of the query flows back to the DAL server, which forwards it to the program, possibly along with summary data computed by the DAL server.
6. The spreadsheet program tracks the status of the Data Access Language requests with the DAL API. When the requested data begins flowing back to your Macintosh computer, the spreadsheet requests it, item by item, from the DAL API and places it into the appropriate cells of the spreadsheet. The spreadsheet now contains a mix of local data and data from the VAX computer.
7. Recalculation of the spreadsheet might trigger new queries to the VAX computer.
8. When you no longer require access to the VAX, the spreadsheet uses the DAL API to end its session with the DAL server.

Figure 6-1 shows the software and hardware components involved in using Data Access Language. Note that the software components can be found in the folders indicated in this figure only if the Macintosh is running system software version 7.0. To find out where these components are installed in a version 6.0.*x* environment, see the section "Where the Software Is Located" in the *Installation* part of this guide.

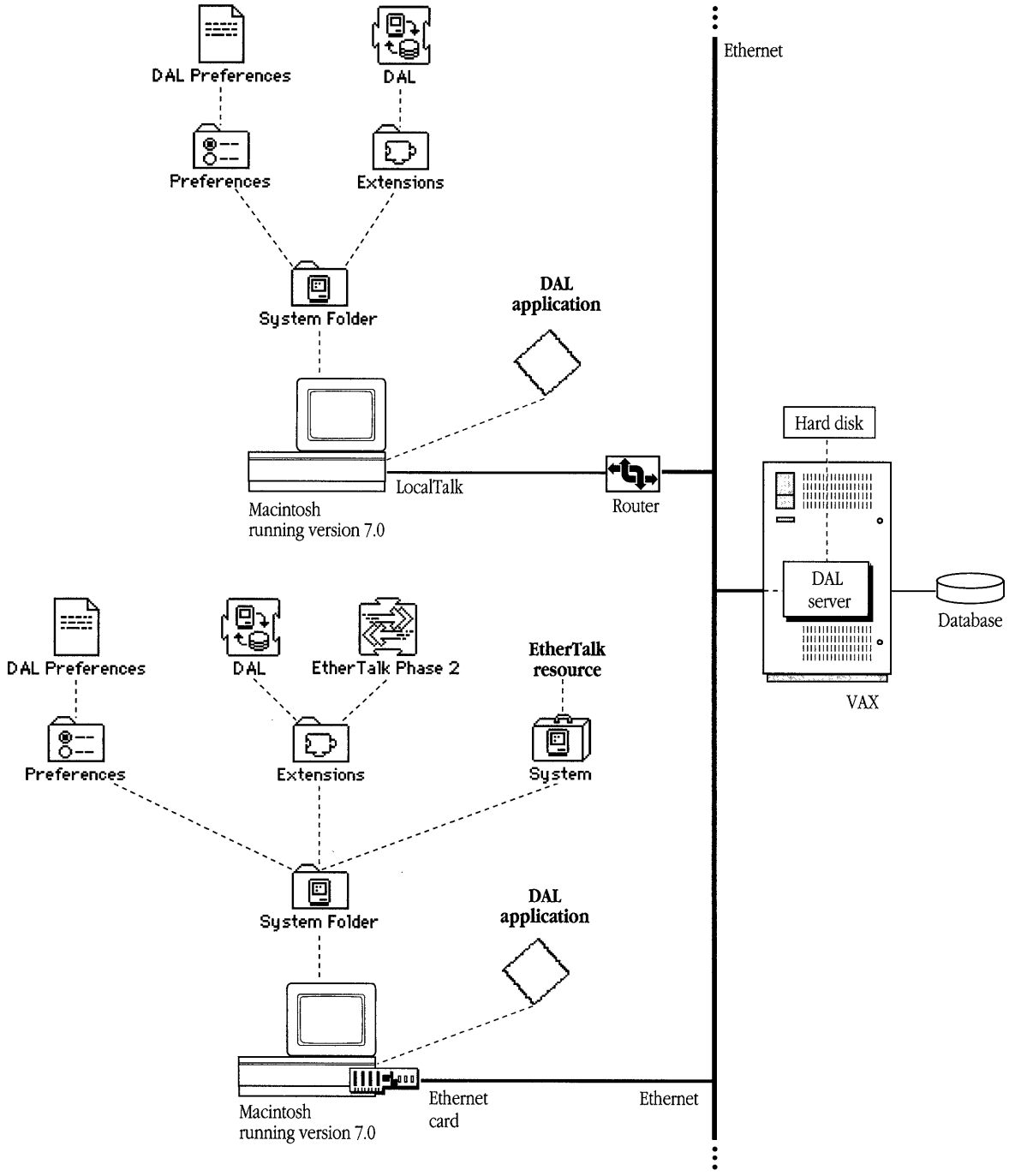


Figure 6-1 Network components for Data Access Language

Preferences files

When you run the Installer program as described in the *Installation* part of this binder, a preferences file is installed on your Macintosh computer:

- If you are running system software version 6.0.*x*, a file called *hosts.cl1* is installed in the System Folder.
- If you are running version 7.0, a file called *DAL Preferences* is installed in the Preferences Folder (which is located in the System Folder). Note that many existing third-party programs refer to the hosts.cl1 file. If you are using one of these programs, you must create a hosts.cl1 file. Both the DAL Preferences and hosts.cl1 file must contain exactly the same information.

These preferences files tell your application programs how to make a connection to a DAL server on a VAX computer. They specify the type of network to use, how to find the target VAX system on that network, and how to log on to the VAX.

The files are made up of entries called connection definitions. Each connection definition is a colon-delimited set of communication parameters. These parameters include

- **The host name**—The first parameter in the connection definition is the host name that you assign to the connection. If you are making an AppleTalk/Ethernet connection to a VAX computer, you must also specify the name of the DAL server on the AppleTalk network and the name of the AppleTalk zone in which the VAX resides.
- **The network adaptor name**—The second parameter in the connection definition is the connection type, which specifies the kind of network that links your Macintosh computer and the VAX computer. You can specify either an AppleTalk or asynchronous network connection.
- **The log-in definition**—If you are making an asynchronous network connection, you must specify an asynchronous log-in definition that defines the sequence required to log on to a VAX computer after a physical connection has been established. If you do not specify a log-in definition, you must use MacTerminal to log on to the host system before Data Access Language can connect to the VAX.

You can edit the preferences file using the HyperCard DAL Preferences editor or any Macintosh text editor, such as TeachText. To install the DAL Preferences editor follow these steps:

1. Mount and open the VAXshare server volume called PATHWORKS V1.1 (as described in the *Installation* part of this binder).
2. Open the Programmer's Folder.
3. Open the DAL for PATHWORKS folder.
4. Open the Data Access Language folder.
5. Open the DAL Tester & Debugger folder.
6. Drag the DAL Preferences Editor to your hard disk.

△ **Important** Since you need to understand communications scripting languages and know your network connection methods to configure these files, your system administrator will do it for you. If you want to perform this task on your own, refer to the *PATHWORKS for Macintosh: Client Administrator's Guide.* △

Troubleshooting

Data Access Language has three tools that allow you to verify that DAL software is correctly installed on your Macintosh computer:

- The DAL Tester application program allows you to select a connection to a VAX server and execute DAL statements interactively.
- The DAL Installation Checker identifies the DAL driver and network adaptors installed on your Macintosh, assesses their compatibility with each other, and identifies which ones, if any, are improperly installed.
- The DAL Debuggers allow you to troubleshoot problems with your preferences file.

To install the tools, follow these steps:

1. Mount and open the VAXshare server volume called PATHWORKS V1.1 (as described in the *Installation* part of this binder).
2. Open the Programmer's Folder.
3. Open the DAL for PATHWORKS folder.
4. Open the Data Access Language folder.
5. Drag the DAL Tester & Debugger folder to your hard disk.

△ **Important** Your system administrator will use these tools to verify that the installed DAL software is functioning correctly. If you want to use these tools, refer to the *PATHWORKS for Macintosh: Client Administrator's Guide.* △

Appendixes

Appendix A: Network Basics

This appendix explains what networks are, how they work, and how they are put together. It gives an overview of the networking systems created by Apple Computer and by Digital Equipment Corporation. It also explains how Macintosh networks and Digital networks can be connected, letting you use your Macintosh computer to access services running on VAX computers. If you have questions about terms or concepts encountered in this manual, this appendix may provide the answers. The Preface of *Using Network Services* (this part of the *Network Services User's Guide* binder) lists books that you can read for further information about networks.

What is a network?

Network services greatly expand the power and flexibility of your computer. A computer network can let you communicate with other users, access information, and share devices such as printers. Networks can give you access to information on **remote computers,** such as large company databases, and let you communicate with users around the world.

A computer network consists of

- at least one computer
- devices such as display terminals and printers (optional)
- some means of connecting the computers and other devices—that is, connection media
- rules that govern how data is transmitted over the connection—that is, communications protocols

Figure A-1 is a diagram of a computer network that includes several Macintosh and VAX computers and other devices such as laser printers, bridges, and routers. The lines denote different types of connection media. The thickest line indicates the Ethernet **backbone.** The medium weight lines indicate other Ethernet cables. The thinnest lines indicate LocalTalk cables. The labels next to the lines indicate the types of media.

The sections that follow describe how the devices on a network communicate with each other.

How networks operate

Each device that sends and receives information on a network is called a *node.* Each node has an address to identify it, in the same way that the address of a home or business identifies its location. A node's address contains a node number and may also identify the network on which the node is connected. To perform tasks such as sending files to a printer or transmitting messages between users, the networking software requires the addresses of both sender and destination nodes.

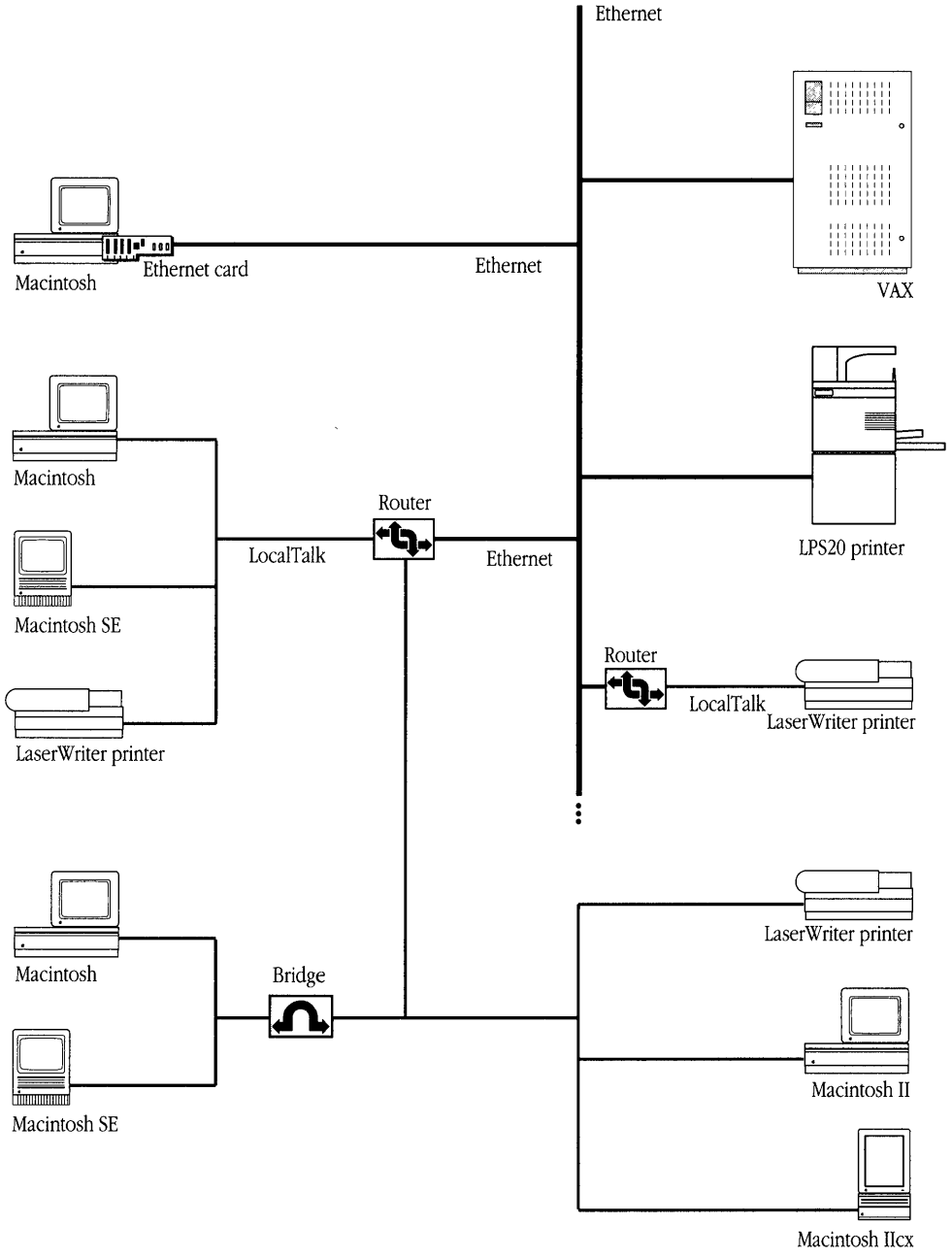


Figure A-1 A computer network

A computer with multiple connections to the network can act as more than one node. For example, if your Macintosh computer has two Ethernet cards installed, each card appears and acts as a separate node on the network. A VAX computer may also act as multiple nodes on a network.

For ease of use, the networking software may present to users the names of services and devices, rather than the node addresses. When a user selects the name of a service or device, such as a file server, the networking software translates this name into the proper address.

When you send data from your Macintosh to another computer on the network, the networking software formats the data into packets. A **packet** includes the data itself, the addresses of the sender and the destination, and information telling the destination device and connecting devices along the way what to do with the packet. The format of a packet on a given network is determined by that network's communications protocols.

Communications protocols

Communications protocols are rules that specify how computers and other devices transmit and receive data. The protocols specified by your networking software ensure that each step in the communication process happens in a consistent way.

For example, when you send an electronic mail message to another user, protocols determine how your computer generates the signal over the network medium and how the signal will be received at the other end. Protocols also route the message to its destination, ensure that the transmission occurs reliably, and manage the interaction between the two communicating computers.

How networks are put together

This section describes the physical connections that make up a network—the various types of media, how computers are connected to a network, how media can be combined to form complex networks, and how networks can be expanded and interconnected.

Network media

The media that a network uses are the physical means by which the network transmits information. Commonly, networks use various types of wires and cables to carry transmission signals. Other network media include optical fibers, telephone lines, microwaves, and even satellites.

Each type of medium offers different advantages in terms of speed, reliability, and cost; each has different limitations in terms of the size of network that it supports. The people who set up a network choose media that best meet the group's needs. The types of media most often used in Apple and Digital networks are described later in this appendix.

Making the connections

A computer can be connected to a network in three ways:

- You may be able to plug a network cable directly into a network port built into the computer. The Macintosh, for example, has a network port to which you can connect LocalTalk cables that join Macintosh computers and LaserWriter printers.
- You can install a special circuit board, or card, in some computers; the card usually provides a network port and network connection software and circuitry. For example, if you have a Macintosh SE or Macintosh II computer, you can install an Ethernet card in your computer, as described later in this appendix, to connect to a Digital network. If you have a Macintosh Plus or a Macintosh Portable computer, you can use an external card or box to connect to a Digital network. Your Macintosh can be connected to networks through both built-in and add-on connections at the same time.
- You can use a specialized modem to connect the computer to the network. Note that most modems enable you to connect only to a remote computer; they do not enable you to connect to a network.

LANs and WANs

Computer networks can take many different forms, depending on the needs of the people using them. A network can include a few or many devices. The connected devices can be close together, perhaps within the same office or building, or they can be scattered across the globe.

If you are using a network that includes computers and other devices within your office building, you are probably connected to a **local area network,** or LAN. There may be only a few other users on a local area network or hundreds, but all of the network equipment in a LAN is contained in a relatively small area, such as a single building or group of offices. The equipment is generally owned by the organization using the network.

If your network includes computers that are far apart, communicating by means of telephone, microwave relay, satellite, or other long-distance connections, you are connected to a **wide area network,** or WAN. A wide area network typically includes connection services and equipment provided by a telecommunications company, such as a telephone company.

Local area networks can be connected together, or connected to one or more wide area networks, with special devices called bridges, routers, and gateways. These devices provide different features that create different types of expanded networks, as described in the next section.

For example, a university library might have a large local area network in its main branch, as well as smaller local area networks in each of its departmental branches—Physics, Anthropology, Music, and so on. These local area networks could be connected by telephone lines, allowing the librarians in each branch to communicate over a wide area network. The wide area network could be expanded to include library networks at other campuses across the country.

The next section describes the connection devices used to expand networks.

Expanding a network

Four kinds of devices are used to expand networks: repeaters, bridges, routers, and gateways.

A **repeater** is a device that receives a signal, amplifies it, and retransmits it over the network. Thus, a signal can be transmitted over a greater distance without losing its integrity. Because a repeater increases the distance that a network cable can cover, it also increases the number of devices that can be connected.

A **bridge** is a device that connects two or more networks into a larger network. A bridge is used to connect networks that use the same communications protocols. The networks may, however, transmit data at different speeds.

If one part of your network is connected to another part by a bridge, you can send data to devices on the other side of the bridge and receive data from those devices. The bridge makes network traffic more efficient because data traveling between devices on the same side of the bridge stays on that side, rather than traveling over the entire network. Figure A-2 illustrates a bridge connection.

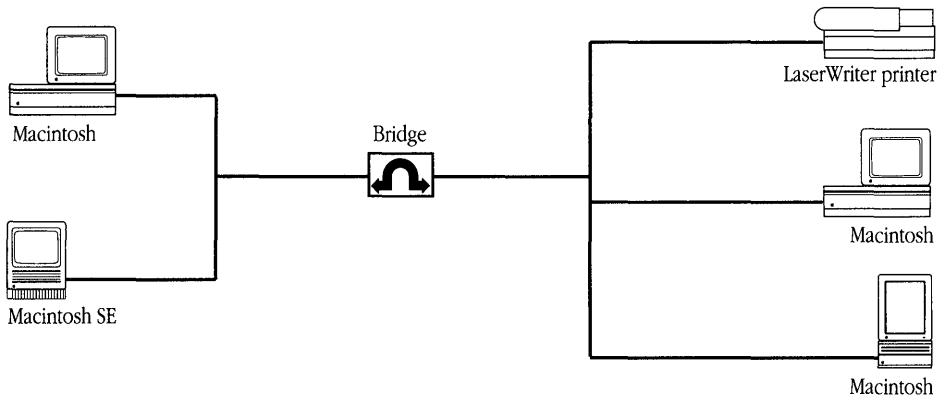


Figure A-2 A network using a bridge

A **router** is a device that, like a bridge, connects networks that use similar communications protocols. However, a router can connect networks that use different connection media. For example, your Macintosh computer may be connected to a LocalTalk network that is in turn connected to a Digital network by a router. When two or more networks are connected by routers, the result is called, in Apple terminology, an **internet.** (The term internet may have other meanings in non-Apple computing environments.)

Data transmitted over an internet reaches its destination along the most efficient route. A router is "aware" of the networks and other routers on the internet. When the router receives a packet, it reads the destination address and sends the packet to that network and device by as direct a route as possible. By contrast, if the networks were connected by bridges, the data would travel along the network until it reached its destination device—perhaps traversing the entire network. Thus, a router ensures that information flows as quickly as possible. If a connection is broken somewhere in the internet, the router can select an alternate path. Figure A-3 illustrates a router connection.

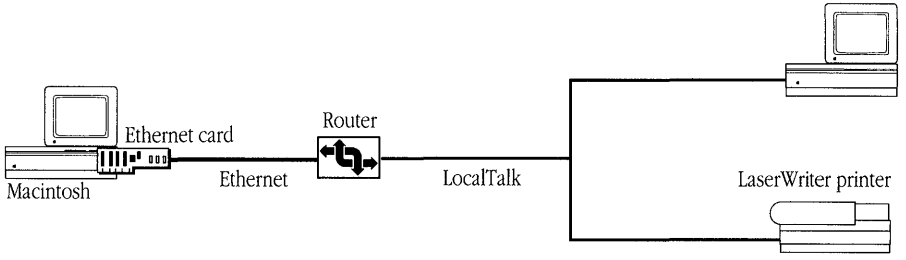


Figure A-3 An internet using a router

A **gateway** translates data from the format specified by one protocol to that specified by another. A gateway usually consists of software running on a computer.

Both a router and a gateway can be used together on an internet. For example, PATHWORKS for Macintosh includes a gateway called the *AppleTalk/DECnet Transport Gateway,* which resides on a VAX computer. The gateway translates between AppleTalk protocols and the DECnet protocols used by the VAX. It also provides one of the ways by which you can use MacX to access DECwindows applications running on the VAX. (See Chapter 5 for details.) Figure A-4 shows an AppleTalk/DECnet Transport Gateway on an Apple and Digital internet. See the *AppleTalk-DECnet Connection Tool* reference module in the *MacX User's Guide* for more information about the AppleTalk/DECnet Transport Gateway.

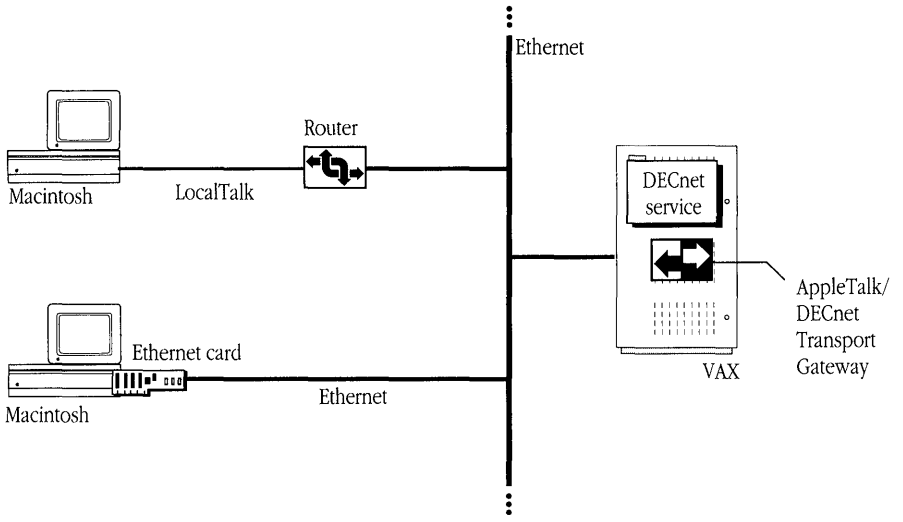


Figure A-4 An Apple and Digital internet with a router and gateway

Apple networks

The AppleTalk network system, designed by Apple Computer, lets you create networks that include both Apple devices and devices made by other companies. The AppleTalk network system includes computers and other devices, networking software, and communications protocols. It also includes a system of cables, cable extenders, and connection boxes called *LocalTalk*. All Macintosh computers and LaserWriter printers are equipped to use the LocalTalk cables, so that it is easy and relatively inexpensive to set up this kind of network. Built into these computers and printers is the capability to use AppleTalk protocols, the communications protocols commonly used by devices connected by LocalTalk.

Figure A-5 shows a simple network that uses AppleTalk communications protocols and LocalTalk cables.

To make it easier to locate and access network devices and services on an AppleTalk network, the devices and services are often divided into groupings called *zones*. The devices and services in each zone are conceptually related—they need not be in physical proximity to each other. In fact, they can be in separate buildings or even in different cities.

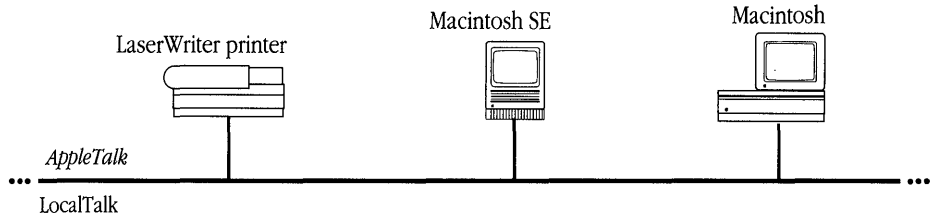


Figure A-5 An AppleTalk network

To access a device or service, you choose the zone where it resides. Rather than searching through a single large list of all the devices and services available on the network, you specify a zone and then select from the relatively small list of devices and services available in that zone.

Two versions of AppleTalk are currently in use: AppleTalk Phase 1 and AppleTalk Phase 2. AppleTalk Phase 2, introduced in 1989, provides extensions to the original AppleTalk network system, allowing it to support larger and more flexible networks. (For example, with AppleTalk Phase 2, a single network can contain several zones, and a single zone can cross several networks.) A network can run either AppleTalk Phase 1 or AppleTalk Phase 2, or both at the same time.

If your network uses both versions of AppleTalk, it is recommended that you install AppleTalk Phase 2 on your Macintosh computer. (To use PATHWORKS for Macintosh, you must have AppleTalk Phase 2 installed.) Using AppleTalk Phase 2, you can see and communicate with network devices that use Phase 2 as well as those that use Phase 1. However, if you have AppleTalk Phase 1 installed on your computer, you can see and communicate with only other network devices that use AppleTalk Phase 1—not those that use Phase 2.

New developments in network design have provided more options for connecting Apple computers to networks and internets. Some of these options are discussed in "Connecting the Apple and Digital Environments," later in this appendix.

Digital networks

Digital Equipment Corporation has created its own networking solutions. Digital uses a system of cables and connectors called *Ethernet* to form the physical components of the network. Digital networks can use a number of different communications protocols at the same time. The protocols that you may need to know about when you use PATHWORKS for Macintosh are the DECnet protocols and the LAT protocol.

- DECnet is the set of communications protocols most often used in Ethernet environments.
- The Local Area Transport (LAT) communications protocol is commonly used by terminals connected to a LAT terminal server, a device that provides high-speed terminal services for a VAX computer.

Figure A-6 shows an Ethernet environment that uses DECnet communications protocols and Ethernet cables.

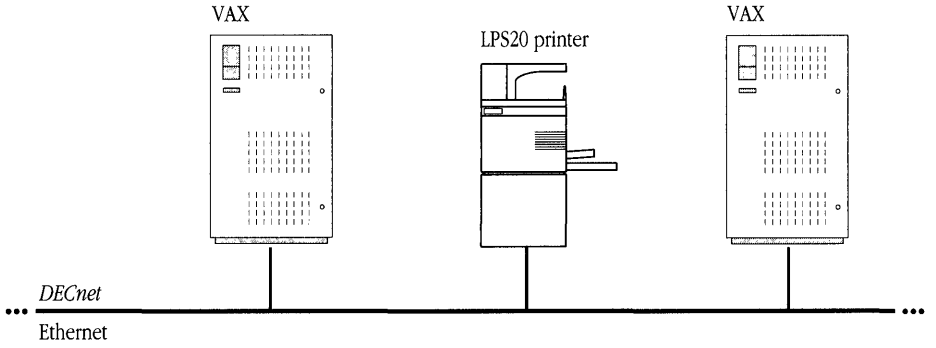


Figure A-6 An Ethernet environment

The next section describes how Apple and Digital networking environments can be connected.

Connecting the Apple and Digital environments

As networking products have become more sophisticated, new options for network design have become available. Connection media have been adapted to enable computers of different types to communicate with each other by way of many different protocols.

This section describes how Macintosh computers and LocalTalk networks can be physically linked to Ethernet environments and how computers in the two environments can use a variety of protocols to communicate with each other.

Physical connections

Macintosh computers can be connected to a VAX computer or Digital network in several different ways. Figure A-7 shows two ways that a Macintosh computer can be connected to a Digital network. The Macintosh may be connected to a LocalTalk network, which in turn is connected to Ethernet by a router. The router links the AppleTalk network and Ethernet to form an internet. Alternatively, the Macintosh may be connected directly to Ethernet through an Ethernet card installed in the Macintosh. (A table in the *LAT Connection Tool* reference module in the *MacTerminal User's Guide* lists the Ethernet cards known to work with PATHWORKS for Macintosh.)

Figure A-8 shows two ways that a Macintosh computer can be connected directly to a VAX computer: by a modem and by a serial cable. (If you are connected to a VAX computer in either of these ways and do not, in addition, have a network connection to an Ethernet environment, you can use only some of the services provided by PATHWORKS for Macintosh. See "Modem and Serial Connections" in Chapter 4.)

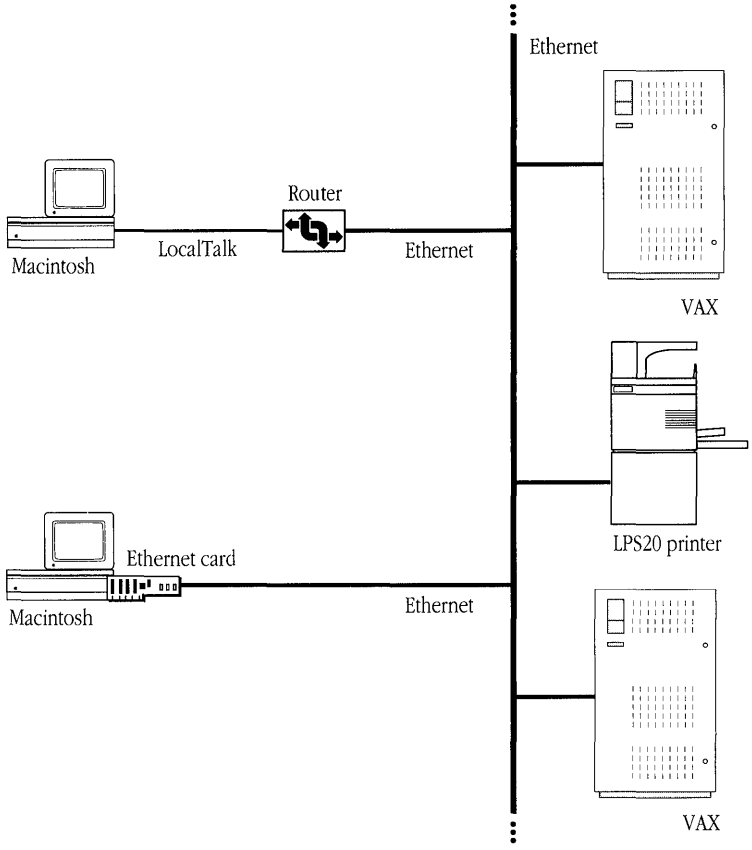


Figure A-7 An Apple and Digital internet

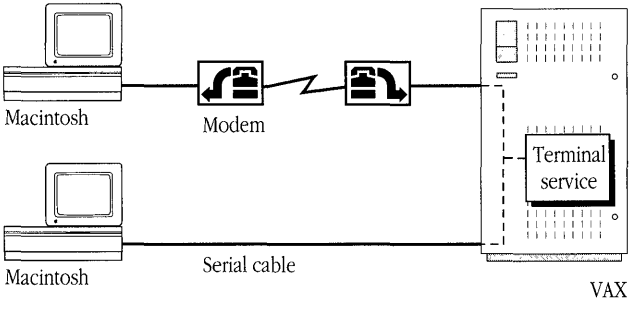


Figure A-8 Modem and serial connections

Communicating in the shared environment

PATHWORKS for Macintosh provides a number of components that, working together, give Macintosh and Digital computers great flexibility in communications. Here are some of them:

- AppleTalk for VMS 3.0 is software that runs on VAX computers and allows them to use AppleTalk protocols. When a VAX computer is running AppleTalk for VMS, a Macintosh computer can communicate with that VAX by using the protocols built into the Macintosh. (AppleTalk for VMS existed as a separate product before the development of PATHWORKS for Macintosh. AppleTalk for VMS version 3.0 is completely different from previous versions.)
- EtherTalk is a variation of the AppleTalk network system that allows Macintosh computers to use AppleTalk communications protocols over Ethernet connections, both to other Macintosh computers and to VAX computers that are running AppleTalk for VMS. Note that to use PATHWORKS for Macintosh, you must install EtherTalk Phase 2, the version of EtherTalk that works with AppleTalk Phase 2.
- The AppleTalk/DECnet Transport Gateway translates between AppleTalk and DECnet protocols for AppleTalk and Digital networks connected by a router or through an Ethernet card. PATHWORKS for Macintosh also supplies the AppleTalk-DECnet Connection Tool, which lets Macintosh applications communicate with VAX services through the gateway.
- The AppleTalk-LAT Connection Tool and the LAT Connection Tool allow Macintosh users to access terminal services by using Digital's LAT protocol. (See Chapter 4 for details.)

Most of these components work behind the scenes—that is, without you having to use them directly or even be aware of their existence. You do, however, have to select and configure connection tools from the MacTerminal and MacX application programs when you use them to access PATHWORKS for Macintosh network services. Chapter 4 describes how to use connection tools with the MacTerminal program. Chapter 5 describes how to use connection tools with the MacX program.

Appendix B: VAXshare Management Command Reference

This appendix describes the Digital Command Language commands that you can use to perform VAXshare management tasks. These commands apply primarily to VAXshare file servers; a few, however, apply to VAXshare print servers and to obtaining information about the VAXshare management system.

About the VAXshare management commands

The Digital Command Language (DCL) commands included with PATHWORKS for Macintosh allow you to create your own volumes on a VAXshare file server, to make those volumes available on the network, and to remove the volumes from the network. You can also use these DCL commands to add and remove aliases, to get help for using the commands, and to obtain information about file servers, print servers, and other parts of the system.

△ **Important** This section contains information for advanced users who are already familiar with the VMS operating system and with DCL. If you are not familiar with DCL, you should consult your system administrator before attempting to use the commands described in this section. △

In the VMS operating system, many commands are known as *privileged* commands. Privileged commands are those commands available only to certain network users, such as the system administrator. The set of VAXshare management commands described in this section are not privileged commands—they are available to all users.

The system administrator, however, can specify whether you have read-only or read/write privileges for a VMS directory. Directory privileges determine whether or not you are allowed to make changes to the files and services in a directory.

You must have read/write privileges for the root directory—in Digital terminology, you must "own" the directory—in order to issue the following commands:

- `DISMOUNT`
- `MODIFY VOLUME`
- `MOUNT`

Using the VAXshare management commands

You use the VAXshare management commands from your account on the VAX computer. Chapter 4, "Terminal Services," describes how to log in to your account using the MacTerminal program supplied with PATHWORKS for Macintosh.

When you have logged in successfully, you see the DCL prompt (`$`). To start the VAXshare manager, type `ADMINISTER/MSA`. This command starts a program called MSA$MANAGER. When the program begins to run, you see the VAXshare manager prompt (`MSA$MANAGER>`). Now you can enter VAXshare manager commands to execute the tasks you need to perform. A command consists of a verb, typically followed by a noun, which is often followed by one or more parameters and qualifiers. (You can provide the parameters and qualifiers in any order that you like.)

After you enter a command and press the Return key, the VAXshare manager executes the command. If the command does not execute, you get an error message. If the command executes properly, you see the VAXshare manager prompt again. (Some commands return data before displaying the prompt.)

Your primary use for these commands is to create and manage VAXshare volumes. You use the `ADD VOLUME` command to create a VAXshare volume in a VMS directory (note that you must be a privileged user to use this command). You specify the volume with the *volumeName* parameter. You can also specify a password, read/write privileges, and the level of verification for the volume.

You are required to provide the `/ROOT_DIRECTORY` qualifier with the `ADD VOLUME` command. This qualifier specifies the VMS directory that you want to use as a VAXshare volume. If you specify an existing directory, the VAXshare manager sets up the directory so that it can be used as a VAXshare volume. If you specify a directory that does not exist, the VAXshare manager creates the directory first, then sets it up as a VAXshare volume.

To use a VMS directory as a VAXshare volume, the VAXshare manager maintains a special file called the catalog file (the name of the file is *folderName*.MSAF$CAT) for each folder in a volume. This file keeps track of the two parts of a Macintosh file—the **data fork** and the **resource fork.** Each fork of a Macintosh file can be thought of as a file in and of

itself. In fact, when a Macintosh file is stored on a VAXshare volume, two files must be created—one for each fork. The catalog file also contains Finder information for each pair of Macintosh files, such as its creator, type, and icon. This information allows a file stored on a VAXshare server volume to be used from a Macintosh computer. The file appears on a Macintosh desktop with its usual icon. If the file is a document, it will automatically start the appropriate application when opened.

After you have created a volume, you must use the `MOUNT` command to make the volume available to VAXshare users. After you have mounted the volume, other VAXshare users can see the volume listed in their Chooser desk accessory and can display the volume on their desktops.

◆ **Note** In the context of VAXshare file servers, the phrase *to mount a volume* may be used to refer to two different activities. When you display a file-server volume icon on your desktop, as described earlier in this guide, you are said to be mounting the volume. Using the `MOUNT` command to make a volume available on the network is also called mounting the volume. In all other chapters, this manual uses *mount* in the first sense. In this chapter, *mount* refers to the process of making the volume available on the network by using the `MOUNT` command. ◆

When you have finished working with the VAXshare manager, enter the `EXIT` command to exit the VAXshare manager and return to the DCL prompt.

How the command descriptions work

Each command description consists of three or four sections: Command, Qualifiers, Description, and Example.

◆ **Note** As with other DCL commands, you only need to type the first four characters of the VAXshare manager commands, qualifiers, and parameters. ◆

Command section

The Command section shows the syntax of the VAXshare management command. Commands typically include parameters, which follow the command name. Each parameter appears as an italicized word that describes its purpose. If there are two or more parameters, separate them with a space when you type the command. Parameters in parentheses ( ) are optional.

Parameters can be typed in any order when you execute the command. You must provide valid values for the parameters. If you provide an invalid value for a parameter, you receive an error message. If you enclose a *Chooser-UserName, password, printerName, serverName,* or *volumeName* parameter in double quotation marks, the parameter can contain uppercase and lowercase characters, and include spaces.

The VAXshare management commands use eleven different string parameters. Table B-1 lists the parameters.

Table B-1 VAXshare management command parameters

Parameter	Description
Chooser-UserName	A string of up to 32 characters. The value for this parameter must specify a Macintosh Chooser user name that is unique among the Chooser user names on the attached AppleTalk and DECnet networks. The string can contain any character except the following characters: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains uppercase and lowercase characters, or includes spaces. See the `ADD ALIAS`, `REMOVE ALIAS`, and `SHOW ALIAS` commands.
DECnet-node	A string of up to 6 characters. The value for this parameter must specify a DECnet node address for a VAXshare server. The first character of the string must be alphabetic. You do not need to end the parameter with a colon, although a DECnet-node name is usually followed by a colon when used in a file specification. See the `SET REMOTE` command.
password	A string of up to 8 characters. The value for this parameter specifies the password users enter when they mount a volume using the Chooser. You must enclose the string in double quotation marks if the string contains uppercase and lowercase characters, or includes spaces. See the `MODIFY VOLUME` command.

(continued)➡

Table B-1 VAXshare management command parameters *(continued)*

Parameter	Description
printerName	A string of up to 27 characters. The value for this parameter must specify a print server name that is unique among the print server names on the attached AppleTalk and DECnet networks. The string can contain any character except the following characters: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains uppercase and lowercase characters, or includes spaces. See the `SHOW PRINTER` command.
serverName	A string of up to 31 characters. The value for this parameter must specify a file server name that is unique among the file server names on the attached AppleTalk and DECnet networks. The string can contain any character except the following characters: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains uppercase and lowercase characters, or includes spaces. See the `SET FILE_SERVER` command.
subtopic	A string of up to 255 alphanumeric characters. The value for this parameter must specify a help subtopic. See the `HELP` command.
topic	A string of up to 255 alphanumeric characters. The value for this parameter must specify a help subtopic. See the `HELP` command.
volumeName	A string of up to 27 characters. The value for this parameter must specify a volume name that is unique among the volumes managed by the file server. The string can contain any character except the following characters: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains uppercase and lowercase characters, or includes spaces. See the `MODIFY VOLUME` command.
VMS-password	A string of up to 31 characters. The value for this parameter must specify a VMS password. The string can contain any alphanumeric character, as well as the underscore (_) and dollar sign ($) characters. See the `SET REMOTE` command.
VMS-UserName	A string of up to 31 characters. The value for this parameter must specify a VMS user name. The string can contain any alphanumeric character, as well as the underscore (_) and dollar sign ($) characters. See the `ADD ALIAS` and `SET REMOTE` commands.

Qualifiers section

The Qualifiers section lists any qualifiers that might apply to the command. Qualifiers are extensions to the command that modify the command's action. They are joined to a command or parameter by a slash (/). All qualifiers are optional. Qualifiers and command parameters can be listed in any order, and some qualifiers have parameters following them. See Table B-1 for a description of the parameter types.

Description section

The Description section explains the function of the command and gives details about its parameters. The section also provides details for each of the command's qualifiers.

Example section

The Example section gives a brief example for using the command. In some cases the example shows a series of commands.

The commands

There are 17 nonprivileged VAXshare management commands:

- ADD ALIAS
- DISMOUNT*
- EXIT
- HELP
- MODIFY VOLUME*
- MOUNT*
- REMOVE ALIAS
- SET FILE_SERVER
- SET LOCAL
- SET REMOTE
- SHOW ALIAS
- SHOW CHARACTERISTICS
- SHOW CONNECTIONS
- SHOW FILE_SERVER
- SHOW PRINTER
- SHOW VERSION
- SHOW VOLUME

*You must have ownership (read/write privileges) of the root directory to use this command.

Other DCL commands apply to VAXshare servers. However, these commands are privileged. Privileged commands are available only to certain people, such as the system administrator. Privileged commands are not described in this guide.

ADD ALIAS

Command `ADD ALIAS` *Macintosh-Name VMS-UserName*

Description This command allows you to access a VAXshare file server by providing your Macintosh Chooser user name instead of your VMS account name. You can only add an alias for your own VMS account.

Macintosh-Name:

- In version 7.0, the Macintosh name entered in the Macintosh Name field in the Sharing Setup control panel.
- In version 6.0.*x*, the name that you entered in the User Name field near the bottom of the Chooser window. You must enclose the parameter in double quotation marks if your Chooser user name contains uppercase and lowercase characters, or includes spaces.

VMS-UserName is the name of your VMS account. You can continue to use your VMS user name after adding an alias.

Example

```
MSA$MANAGER> add alias "Joe Grattaballi" joe
```

DISMOUNT

Command `DISMOUNT` *volumeName*

Qualifier `/PERMANENT`
`/NOPERMANENT`

Description This command makes a VAXshare volume unavailable to Macintosh users. The volume remains a VAXshare volume, however, so that you can later remount the volume with the `MOUNT` command. The *volumeName* parameter specifies the volume to dismount. You must enclose the parameter in double quotation marks if the volume name contains uppercase and lowercase characters, or includes spaces.

◆ **Note** You must have ownership of the volume's root directory in order to use this command. ◆

The `DISMOUNT` command has one qualifier:

- `/PERMANENT` and `/NOPERMANENT` determine whether or not the volume dismount is permanent. If you use `/PERMANENT`, then the volume is not mounted the next time the VAXshare file server is started. The default is `/NOPERMANENT`.

Example

```
MSA$MANAGER> dismount "Smith's Volume"
```

EXIT

Command `EXIT`

Description This command causes `MSA$MANAGER` to stop. You are returned to the DCL command level.

◆ **Note** Pressing Control-Z is equivalent to issuing the `EXIT` command. ◆

Example

```
MSA$MANAGER> exit
```

HELP

Command `HELP` (*topic* (*subtopic* . . .))

Description This command provides on-line, user-level documentation on the VAXshare management commands. You can supply a *topic* and any number of *subtopics* with the `HELP` command. If you specify a topic or subtopic for which there is no help, or if you do not specify a topic, you are prompted for one.

Example

```
MSA$MANAGER> help mount
```

MODIFY VOLUME

Command `MODIFY VOLUME` *volumeName*

Qualifiers

`/ACCESS=READ_ONLY`
`/ACCESS=WRITE`

`/PASSWORD=`*password*
`/NOPASSWORD`

`/PERMANENT`
`/NOPERMANENT`

`/VERIFY(=FULL)`
`/VERIFY=PARTIAL`
`/NOVERIFY`

Description This command allows you to change the attributes of a VAXshare file server volume. Any changes you make take effect the next time you mount the volume.

◆ **Note** You must have ownership of the volume's root directory in order to use this command. ◆

The *volumeName* parameter specifies the name of the Macintosh volume that you want to modify. You must enclose the parameter in double quotation marks if the volume name contains uppercase and lowercase characters, or includes spaces.

The `MODIFY VOLUME` command has four qualifiers:

- `/ACCESS` specifies the type of access allowed to the volume: write-enabled or read-only. `/ACCESS=READ_ONLY` allows users to read the files in the volume but not to change them. `/ACCESS=WRITE` allows users to change the files, as well as read them. The default value is `WRITE`.

- /PASSWORD=*password* specifies the volume password. You must use this qualifier if you want the volume to be password-protected. Otherwise, the volume will have unrestricted access. If you enclose the password in double quotation marks, you create a case-sensitive password, and users must not only type the correct characters for the password but must use the correct capitalization as well. You can also include spaces if you enclose the password in double quotation marks. Specifying /PASSWORD=* allows users to enter their password without the password appearing on the screen. /NOPASSWORD is the same as not supplying the /PASSWORD qualifier and is the default.
- /PERMANENT and /NOPERMANENT determine whether or not the volume dismount is permanent. If you use /PERMANENT, then the volume is not mounted the next time the VAXshare file server is started. The default is /NOPERMANENT.
- /VERIFY determines whether the VAXshare file server will perform verification of the structure of the volume, and the level of that verification. If you do not supply the qualifier, or you supply the /VERIFY qualifier without specifying the level, the default is FULL. Full verification is the most complete and is more time-consuming. With full verification, VAXshare checks the consistency of the catalog file information with all folders and files in the volume. Partial verification only checks the folders. If you supply the NOVERIFY qualifier, no volume verification is performed.

Example

```
MSA$MANAGER> dismount "Smith's Volume"
MSA$MANAGER> modify volume "Smith's Volume"/password=newpass
MSA$MANAGER> mount "Smith's Volume"
```

MOUNT

Command `MOUNT` *volumeName*

Qualifiers `/PERMANENT`
`/NOPERMANENT`

Description This command makes a VAXshare volume available to AppleShare users. Before you can mount the volume, however, it must have already been created with the `ADD VOLUME` command.

◆ **Note** You must have ownership of the volume's root directory to use this command. ◆

The *volumeName* parameter specifies the name of the Macintosh volume that you want to mount. You must enclose the parameter in double quotation marks if the volume name contains uppercase and lowercase characters, or includes spaces.

The `MOUNT` command has one qualifier:

- `/PERMANENT` and `/NOPERMANENT` determine whether or not the volume mount is permanent. If you use `/PERMANENT`, then the volume is mounted each time the VAXshare file server is started. The default is `/PERMANENT`.

Example

```
MSA$MANAGER> mount "Smith's Volume"
```

REMOVE ALIAS

Command `REMOVE ALIAS` *Chooser-UserName*

Description This command removes a Macintosh Chooser user name from the list created by `ADD ALIAS`. *Chooser-UserName* is the Macintosh Chooser user name to be deleted. You must enclose the parameter in double quotation marks if your Chooser user name contains uppercase and lowercase characters, or includes spaces.

You can remove an alias only for your own VMS account. After you have removed your alias, you cannot use your Chooser user name to access the VAXshare server. However, you can continue to use the name of your VMS account.

Example

```
MSA$MANAGER> remove alias "Eric Smith"
```

SET FILE_SERVER

Command `SET FILE_SERVER` *serverName*

Description This command selects a VAXshare file server on a multiserver VAX computer to be the current file server. When two or more VAXshare file servers are installed on the same VAX computer, you can use this command to move between them. The *serverName* parameter is the name of the server that you want to be the current server. You must enclose the parameter in double quotation marks if the server name contains uppercase and lowercase characters, or includes spaces.

Example

```
MSA$MANAGER> set file_server "First Floor Server"
```

SET LOCAL

Command `SET LOCAL`

Description This command selects the default file server and print server running on the local VAX computer—that is, the VAX on which MSA$MANAGER is running. You can use this command to reverse a `SET REMOTE` command.

Example

```
MSA$MANAGER> set local
```

SET REMOTE

Command `SET REMOTE` *DECnet-node*

Qualifier `/PASSWORD=`*VMS-password*
`/USERNAME=`*VMS-UserName*

Description This command selects a remote VAX running VAXshare. *DECnet-node* is the node address of the VAXshare file or print server to be managed. Any VAXshare service accessible over DECnet can be selected.

The `SET REMOTE` command has two qualifiers:

- `/PASSWORD=`*VMS-password* specifies the VMS password for the remote account. Specifying `/PASSWORD=*` causes a prompt to appear so that you can enter the password without it appearing on the screen.
- `/USERNAME=`*VMS-UserName* specifies the VMS user name for the account on the node to be managed. The default is your user name.

Example

```
MSA$MANAGER> set remote LILVAX /password=mypass /user=smith
```

SHOW ALIAS

Command `SHOW ALIAS` *Chooser-UserName*

Description This command displays a list of VMS user names and their Chooser-user-name aliases for the currently selected server. You can only display your own VMS user name unless you have special access privileges. *Chooser-UserName* specifies your Chooser user name. You must enclose the parameter in double quotation marks if your Chooser user name contains uppercase and lowercase characters, or includes spaces.

Example

```
MSA$MANAGER> show alias "Eric Smith"
```

SHOW CHARACTERISTICS

Command `SHOW CHARACTERISTICS`

Qualifiers

`/PERMANENT`
`/NOPERMANENT`

Description This command displays the currently selected VAXshare file server's characteristics: the server name, number of connections allowed, guest name, access privileges, folder depth, and other information about the file server. You can see which file server is the currently selected one by using the `SHOW FILE_SERVER` command. You can set the current file server by using the `SET FILE_SERVER` command.

The `SHOW CHARACTERISTICS` command has one qualifier:

- `/PERMANENT` and `/NOPERMANENT` determine whether the permanent values or the current values in the file server's characteristics database are displayed. `/NOPERMANENT` shows the current values, which may be different from the permanent values. The default is `/PERMANENT`.

Example

```
MSA$MANAGER> show characteristics/permanent
```

SHOW CONNECTIONS

Command `SHOW CONNECTIONS`

Description This command displays a list of active users and the volumes to which they are connected on the currently selected file server. The list shows the VMS user names and the volume names. You can see the currently selected VAXshare file server using the `SHOW FILE_SERVER` command. You can set the current VAXshare file server using the `SET FILE_SERVER` command.

Example

```
MSA$MANAGER> show connections
```

SHOW FILE_SERVER

Command `SHOW FILE_SERVER`

Qualifiers `/ALL`
`/NOALL`

Description This command displays information about the VAXshare file servers available on the selected VAX. The command shows each file server's name, its DECnet node, and your VMS user name. You can set the current VAXshare file server using the `SET FILE_SERVER` command.

The `SHOW FILE_SERVER` command has one qualifier:

- `/ALL` and `/NOALL` determine whether the command displays information on all of the file servers on the VAX (`/ALL`) or on just the currently selected file server (`/NOALL`). The default is `/ALL`.

Example

```
MSA$MANAGER> show file_server
```

SHOW PRINTER

Command `SHOW PRINTER` *printerName*

Description This command displays the characteristics for the printer specified by *printerName*. You must enclose the parameter in double quotation marks if the printer name contains uppercase and lowercase characters, or includes spaces. The command shows the printer's name, its DECnet node, its queue, status, font list, water mark, and any flags set for the printer.

Example

```
MSA$MANAGER> show printer "First Floor Printer"
```

SHOW VERSION

Command `SHOW VERSION`

Description This command displays the current software version numbers for the following services:

- VAXshare File Server
- VAXshare Print Spooler
- VAXshare Print Symbiont
- VAXshare Management Software
- AppleTalk for VMS

Example

```
MSA$MANAGER> show version
```

SHOW VOLUME

Command `SHOW VOLUME`

Qualifiers `/PERMANENT`
`/NOPERMANENT`

Description This command displays the Macintosh volume services available on the currently selected file server. You can see the currently selected VAXshare file server using the `SHOW FILE_SERVER` command. You can set the current VAXshare file server using the `SET FILE_SERVER` command.

The following information is displayed for each volume on the server:

- volume name
- whether the access mode for the volume is read-only or write-enabled
- whether the volume is mounted or dismounted
- root directory of the volume

The `SHOW VOLUME` command has one qualifier:

- `/PERMANENT` and `/NOPERMANENT` determine whether the permanent volume information or the current information is displayed. `/NOPERMANENT` shows the current information, which may be different from the permanent information. The default is `/PERMANENT`.

Example

```
MSA$MANAGER> show volume
```

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Appendix Troubleshooting a DECnet Connection

1 Getting Started

This part of the *Network Services User's Guide* gives detailed instructions for configuring and using DECnet for Macintosh software on your Macintosh computer.

Why DECnet software for Macintosh computers?

When your Macintosh computer runs DECnet software, it can

- connect to any other system or computer that can connect to DECnet networks, including:
  - any personal computers that can connect to DECnet networks
  - operating systems that support DECnet software, including ULTRIX, VMS, RSTS, RT-11, and RSX
  - every computer system made by Digital Equipment Corporation, including VAX computers and RISC workstations
- access and manipulate files on the other systems as if they were Macintosh files and folders
- send and receive electronic mail
- use terminal services to connect to other computers

Figure 1-1 shows Macintosh computers connected to other computers and operating systems that participate in a DECnet network.

Each VAX computer or connecting point in a DECnet network is a node. Every system in a DECnet network, including your Macintosh computer, has a unique node name and unique node address. Each node name begins with a letter and contains up to six letters and numbers.

Information is transferred between nodes over communication links, including Ethernet and serial RS-232C connections. DECnet nodes are grouped into areas, and can be either end nodes or router nodes. Routing is transparent to users. As an end node, your Macintosh computer can send and receive information from any computer that can connect to a DECnet network.

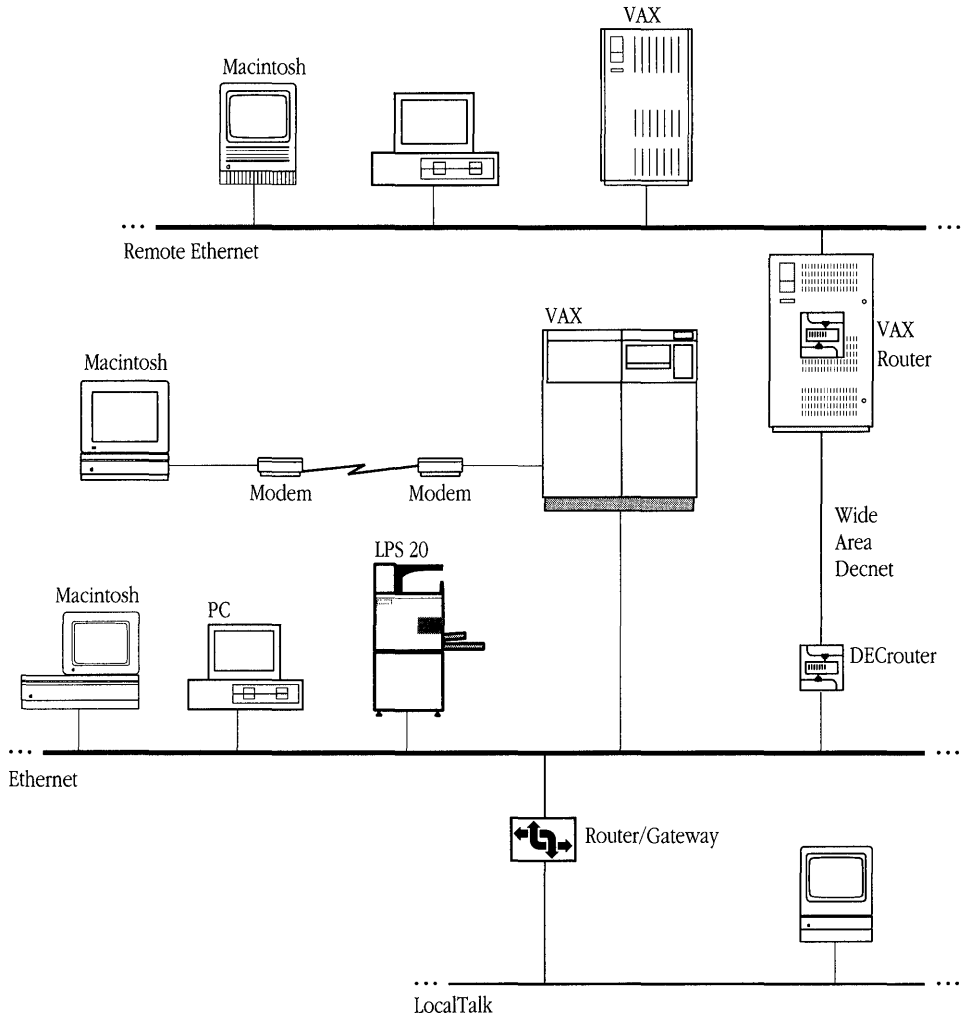


Figure 1-1 Macintosh computers in a DECnet network

Connection methods

To make your Macintosh computer a DECnet end node, you need to install the DECnet software and connect to the network using one of the following connection methods:

- Ethernet
- AppleTalk
- Serial (asynchronous)

Figure 1-2 shows an Ethernet connection. LocalTalk and asynchronous connections are shown in Figures 1-3 and 1-4 respectively.

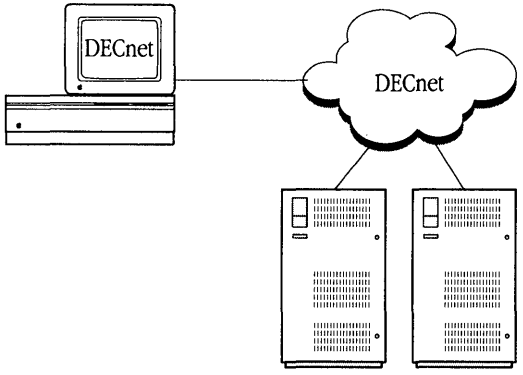


Figure 1-2 An Ethernet connection

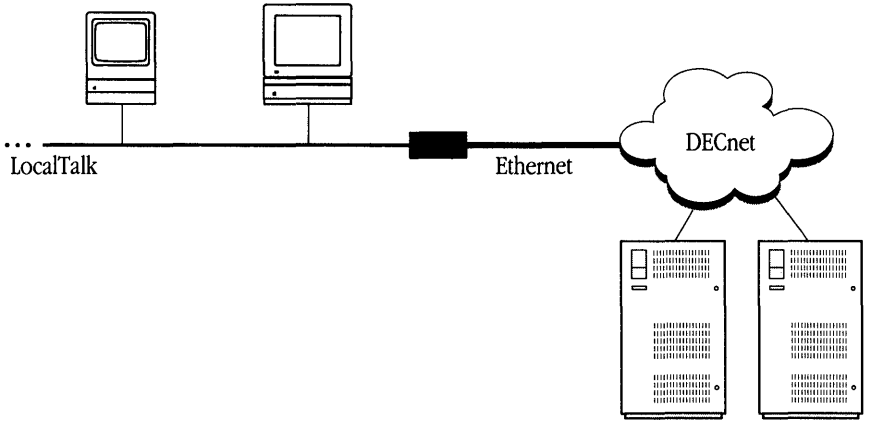


Figure 1-3 A LocalTalk connection

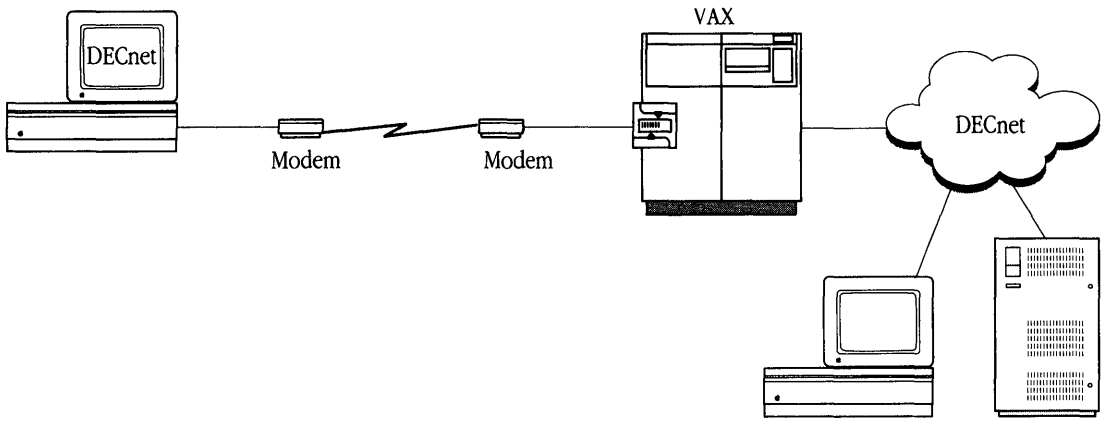


Figure 1-4 An Asynchronous DECnet connection

By using one of these connection methods, your Macintosh computer can send information to and receive information from other DECnet systems.

Hardware, system software, and networking software requirements

This section describes the minimum hardware and software requirements for using DECnet for Macintosh.

Hardware requirements

You must have, at a minimum, the following configuration:

- one of the following Macintosh computers:
  - Macintosh Plus
  - Macintosh Classic
  - Macintosh LC
  - Macintosh Portable

- any of the Macintosh SE family
- any of the Macintosh II family

- 1 megabyte (MB) of memory; 2 MB for system software version 7.0
- one hard disk drive or two diskette drives (this guide assumes that you are using a hard disk drive)

In addition, depending on how you connect to DECnet, you need one of the following items:

- an EtherTalk card (for an Ethernet connection)
- a multiprotocol router, such as Shiva FastPath 4 hardware and software or TSSgate router software (for a LocalTalk connection), as shown in Figure 1-3
- a pair of modems (typically 2400 or 9600 baud) and cables (for an asynchronous connection)

System and networking software requirements

Your Macintosh computer must have the following software installed before you can use DECnet for Macintosh:

- system software version 6.0.4 or a later version of 6.0.*x* (*x* refers to any number); or system software version 7.0
- AppleTalk Phase 2 network software
- EtherTalk 2.0 (if you are connecting through an Ethernet card)
- DECnet connection tool
- DECnet/Mac driver
- Network Control Program (NCP) application
- NetCopy application
- MacTerminal 3.0 and one of the following connection tools
  - CTERM tool (if you are using terminal emulation with DECnet)
  - Serial tool (if you are using a serial port for asynchronous DECnet)

Verifying that DECnet is installed

This section provides only a summary of the installation procedures so you can verify that the DECnet and the related communications software are installed on your Macintosh. Detailed instructions are available in the *Installation* part of this binder, which describes how to install PATHWORKS for Macintosh components. If you have not yet installed the DECnet for Macintosh program and the connection tools you want to use, follow the instructions provided in that part.

Before you configure DECnet, verify that the DECnet control panel device (cdev), the network drivers, and tools are in their proper folders after the customized installation. The section "Where the Software Is Located," in the *Installation* part of this binder, shows where all PATHWORKS for Macintosh components are installed.

If the required components are present, you can use DECnet for Macintosh as soon as you have configured DECnet as described in Chapter 2, "Configuring Your Macintosh for DECnet."

2 Configuring Your Macintosh for DECnet

This chapter describes how to configure your Macintosh as a DECnet node.

Configuring your Macintosh for Ethernet or AppleTalk

To configure your Macintosh computer as a DECnet node for Ethernet or AppleTalk for the first time, perform the following tasks:

- Obtain the network information from your system administrator.
- Start the Network Control Program (NCP).
- Enter your network address in the dialog box.
- Set the name of your node in the Executor Characteristics dialog box.
- Set your user name and password in the Security Settings dialog box.
- Verify your node address in the Executor Characteristics dialog box.
- Set the buffers in the Executor Characteristics dialog box.
- Set the line speed in the Line Settings dialog box.
- Quit NCP and restart your Macintosh computer.
- Start NCP again and verify that DECnet is running.
- Define another node and connect to it.

Once your Macintosh is configured for DECnet, your system automatically loads DECnet software each time it starts up. After configuring DECnet the first time, you can change any part of your configuration at any time from NCP.

To configure your Macintosh for asynchronous DECnet (with a modem connection), see Chapter 7, "Using Asynchronous DECnet Communications."

Obtaining the network information

Before you configure your node, obtain the following information from your network administrator:

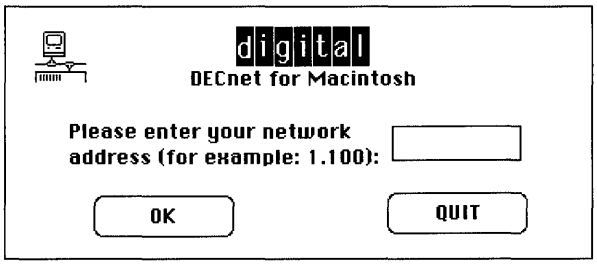
- node name (for example, a node named WESTON)
- node address consisting of an area number and node number (for example, 9.682)
- line type (Ethernet or AppleTalk)

Starting NCP

Start NCP by double-clicking the application icon (shown at left) on the Macintosh desktop or by selecting the icon and choosing Open from the File menu.

Entering your network address

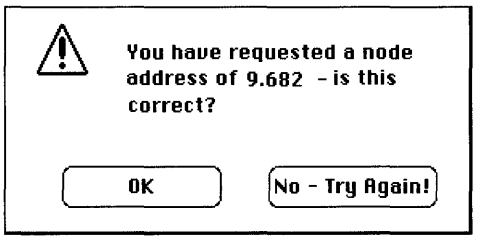
If you are configuring DECnet software for Macintosh for the first time, the following dialog box is displayed when you start NCP:



To enter your address:

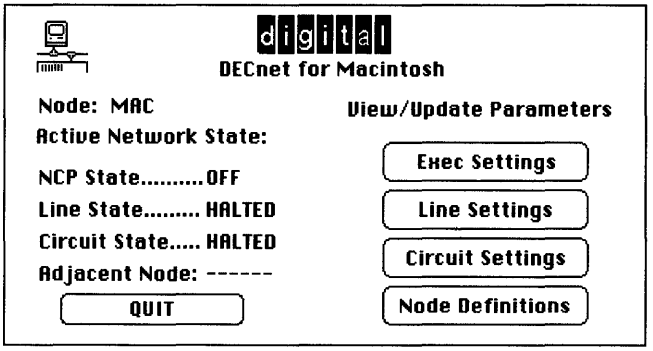
1 **Enter your assigned network address and click the OK button.**

A dialog box is displayed to confirm your entry.



2 **Click the OK button.**

The View/Update Parameters dialog box is displayed.



The menus and buttons in this dialog box give access to all of the settings you need to configure your Macintosh.

◆ **Note** DECnet for Macintosh saves your network address and all other information in a document called Network Data. DECnet for Macintosh creates this document automatically the first time you run the application and maintains the document in your System Folder. If the document is removed from the System Folder, DECnet for Macintosh displays an error and re-creates the document the next time you run NCP. ◆

Entering your node name

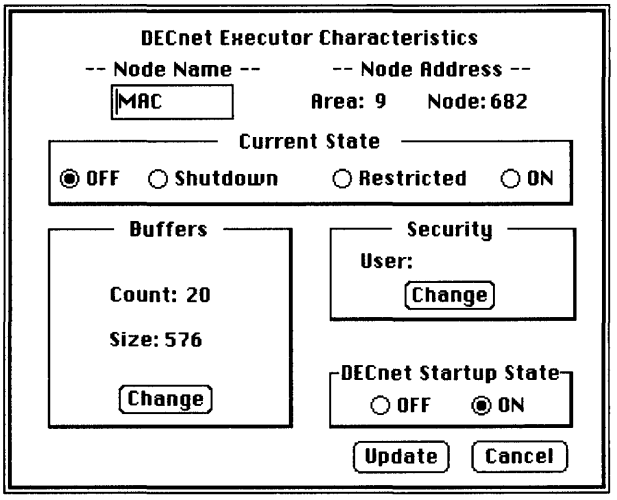
The name of your DECnet for Macintosh node is preset to MAC. You must replace the preset name with your assigned name.

◆ **Note** You must use your assigned name for DECnet to work correctly. ◆

To enter your node name:

1 **Click the Exec Settings button in the View/Update Parameters dialog box.**

The DECnet Executor Characteristics dialog box is displayed. Executor parameters control the operation of your Macintosh node.



2 **Enter your assigned node name in the Node Name box.**

3 **Click the Update button.**

All changes are recorded in the Network Data document.

Verifying your node address

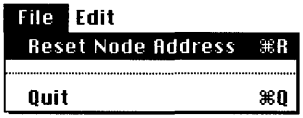
The node address displayed in the DECnet Executor Characteristics dialog box should match the one assigned to you by your system administrator. If you enter your address incorrectly or if you receive a new assigned address, you need to reset your address for DECnet software to work correctly.

To reset your DECnet node address:

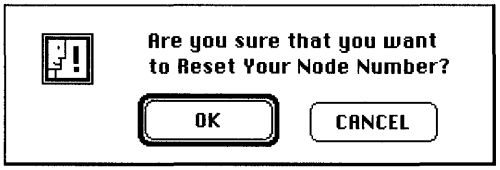
1 **Click the Update button or the Cancel button to exit from the Executor Characteristics dialog box.**

The View/Update Parameters dialog box is displayed.

2 **Choose Reset Node Address from the File menu.**



A dialog box is displayed asking for confirmation.



3 **Click the OK button.**

4 **Enter the new node address and click the OK button.**

The node address change takes effect when you exit NCP and restart your Macintosh.

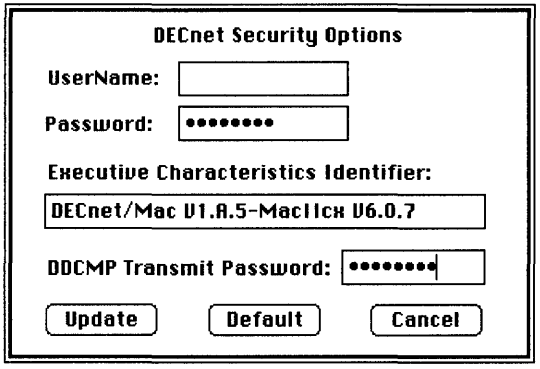
Entering your security settings

You can set up security for your Macintosh node from the DECnet Executor Characteristics dialog box.

To enter your security settings:

1 **Click the Change button in the Security box.**

The DECnet Security Options window is displayed.



2 **Enter a name in the UserName box.**

This name is used to access your Macintosh from remote systems.

3 **Enter a password in the Password box.**

The password determines whether other DECnet nodes can access the files on your Macintosh. The current password limit is 22 characters. See Chapter 4, "Accessing Files From Other Computers on DECnet," for examples of password usage in remote access.

◆ Note The DDCMP Transmit Password box is used in asynchronous DECnet. See Chapter 7, "Using Asynchronous DECnet Communications," for details. ◆

4 **Click the Update button.**

The security changes are in effect when the user name assigned to your Macintosh computer is displayed in the Security box of the DECnet Executor Characteristics dialog box.

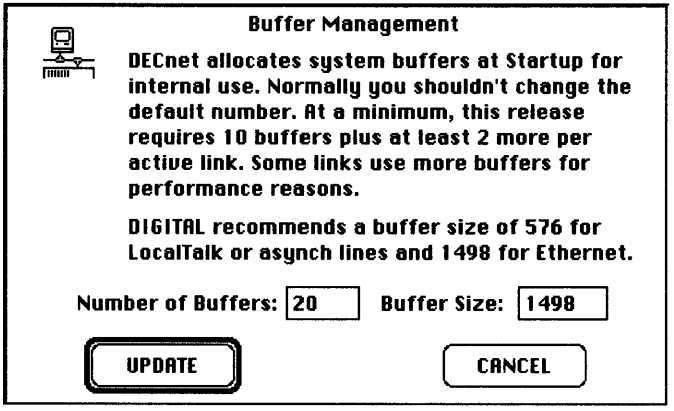
Setting buffers

The current settings for the size and count (number of) buffers for your configuration are displayed in the DECnet Executor Characteristics dialog box. For AppleTalk and asynchronous configurations, you can use the preset values. For an Ethernet configuration, Digital recommends that you increase the buffer size from the preset value to 1498.

To reset your buffers:

1 **Click the Change button in the Buffers box.**

The Buffer Management dialog box is displayed.



2 **Enter the new values in the Number of Buffers and Buffer Size boxes.**

3 **Click the Update button.**

The buffer setting changes take effect when you quit NCP and restart your Macintosh.

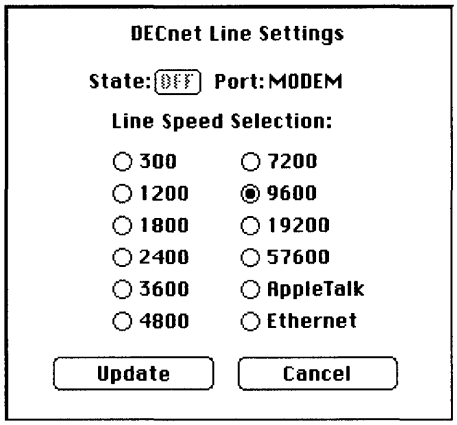
Setting a line speed

The line speed is preset for a 9600 baud asynchronous connection. If you are using an Ethernet, AppleTalk, or asynchronous connection of another speed, you need to reset your line speed.

To reset your line speed:

1 **Click the Line Settings button in the View/Update Parameters dialog box.**

The DECnet Line Settings dialog box is displayed.



2 **Set the line speed according to the type of line you are using.**

Table 2-1 describes the Line Settings window displays. The setting you select in the Line Speed Selection field determines what is displayed in the Port field.

Table 2-1 Line speed window displays

Line speed	Selection	Display description
Any number	Port:MODEM	9600 is the preconfigured setting. See Chapter 7 for more information.
AppleTalk	Port:AppleTalk	The setting used with a LocalTalk router.
Ethernet	Port:Ethernet	The setting used with an EtherTalk card.

3 **Click the Update button.**

The line-speed changes take effect when you quit NCP and restart your Macintosh.

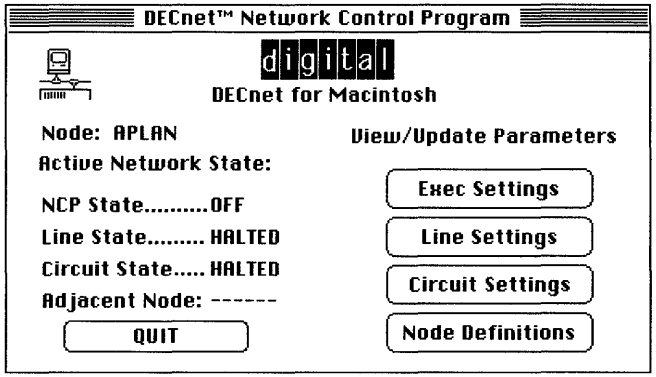
Making configuration changes take effect

Configuration changes to the executor node name, node address, line speed, and buffers take effect only when you quit NCP and restart your Macintosh. Other changes to your configuration user name, password, and node information take effect as soon as you click the Update or Change button.

To make configuration changes take effect:

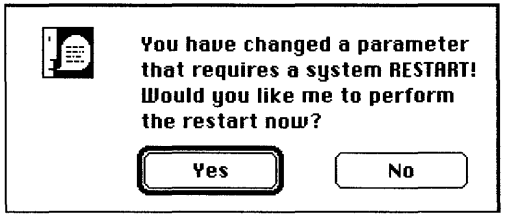
1 **Return to the View/Update Parameters dialog box.**

In the Active Network State field, messages indicate whether DECnet is off or on, and line and circuit states are running or halted:



2 **Click the Quit button.**

If the Restart dialog box is displayed, click the Yes button to restart your Macintosh.

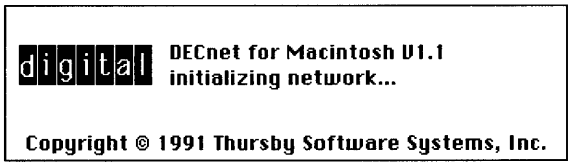


If you have a file open in another application, click the No button to abort the Restart. Close any open files and restart your Macintosh at the earliest opportunity.

When you quit NCP, changes to your configuration are recorded in the Network Data document.

Verifying that DECnet is active

When you restart your Macintosh with DECnet configured, the following message is displayed for several seconds in the Initialization dialog box.

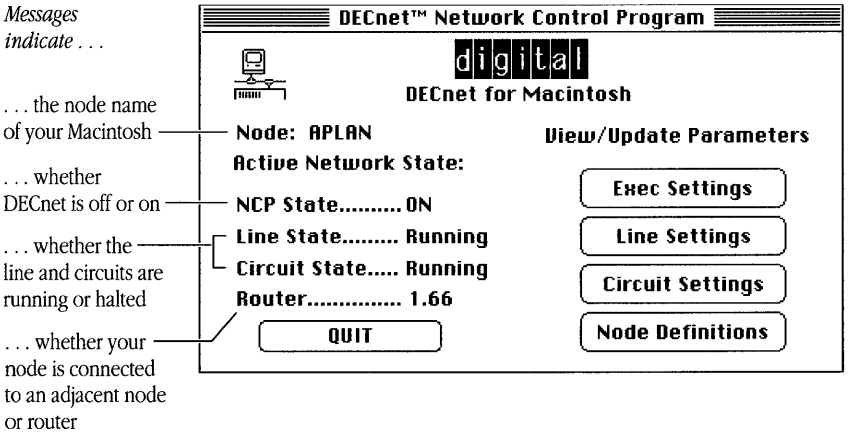


If an error message is displayed, DECnet is not active.

To verify that the DECnet software is active after your Macintosh is started:

- **Start NCP.**

The View/Update Parameters dialog box is displayed.



The Active Network State display indicates that DECnet is running. If your node is connected to a router, the address of the router is also displayed.

If DECnet is not active, see the appendix for troubleshooting information.

Defining nodes

To complete a first-time DECnet configuration, you need to define at least one node to which you can connect. You can define nodes by several methods described in the next section, "Updating Your Node List."

Updating your node list

The node list is displayed in the NCP Node Name Management dialog box and in the NetCopy application. Since you can only connect to nodes in the node list, you need to know how to modify it. You can update your node list by

- defining nodes automatically from a router
- defining nodes manually
- asking a remote system about other nodes
- deleting unused node names
- setting a default user name and password
- setting a node's default device and directory
- setting up access without passwords for other users
- setting up access without passwords for all users

Defining nodes automatically from a router

If the Request Remote Nodes dialog box is displayed in NCP the first time you click the Node Definitions button, you can request nodes automatically from the router. In that case, you can add all of the node definitions to your Network Data file automatically.

To define nodes automatically from the router:

1 **Start NCP.**

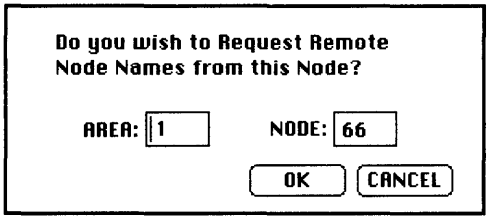
The View/Update Parameters dialog box is displayed.

If your node is connected to a router, the address of the router is displayed in the Router field.

If a series of dashes is displayed in the Router field, you are not connected to a router. In that case you must add another node manually. See the next section, "Defining Nodes Manually," for details.

2 **Click the Node Definitions button.**

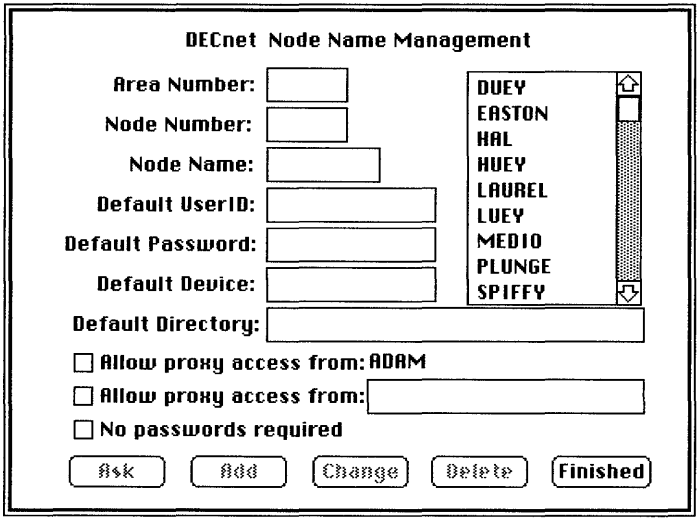
If you can connect to a router, the following dialog box is displayed. For example, if node WESTON has found router RTE66 with address 1.66, the screen displays



◆ **Note** If the preceding dialog box is not displayed, you must manually define your node. (See the next section, "Defining Nodes Manually.") ◆

3 Click the OK button.

The dialog box displays a scrolling list as node numbers are added. When your router has finished defining nodes, the DECnet Node Name Management dialog box is displayed with the names of nodes added to your network database.



4 Click the Finished button.

If you do not connect to a router, you can still connect to the DECnet network. In that case, you must define the first node manually, as described in the next section, "Defining Nodes Manually."

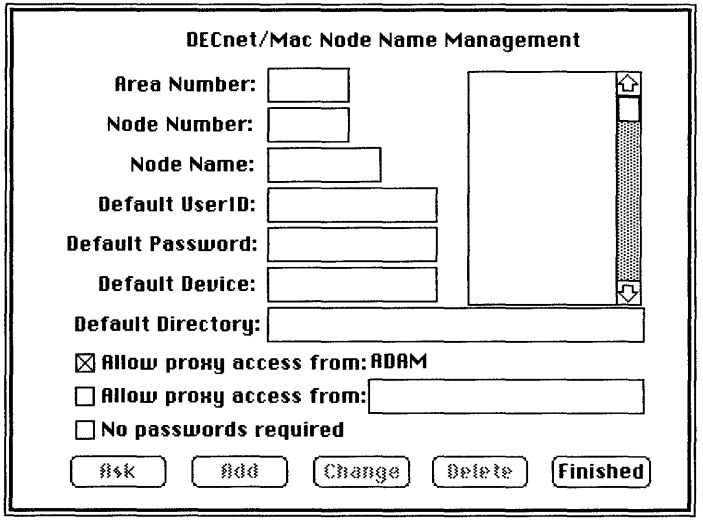
Defining nodes manually

You can enter a node definition for any node for which you know the area number, node number, and node name.

To enter a node definition manually:

1 **Click the Node Definitions button in the View/Update Parameters dialog box.**

The Node Name Management dialog box is displayed.



2 **Enter the area number, node number, and node name of a node you want to add.**

For example, enter the name of a node on which you have an account, or the name of a node that you know maintains information about other nodes.

3 **Click the Add button.**

The name that you added is displayed in your node list.

Asking a remote system about other nodes

An easy way to define new nodes is through a remote system that maintains information about other nodes. This remote system must be in your node list, and you must be authorized to connect to it.

To request nodes through a remote system:

1 **Click the Node Definitions button in the View/Update Parameters dialog box.**

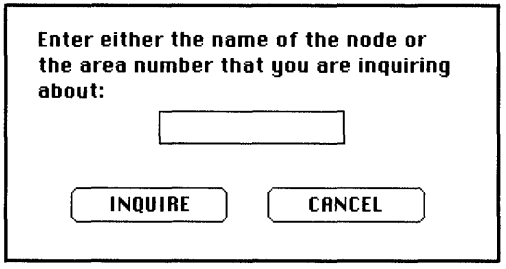
The Node Name Management dialog box is displayed.

2 **Select the remote system through which you want to ask about a new node.**

3 **Click the Ask button.**

Your Macintosh computer indicates that it is trying to connect to a remote system. You can press ⌘-period to cancel the connection.

When a connection is made, the following dialog box is displayed.



4 **Enter the node name or area number of the node you are asking about.**

For example, if you are asking through node EASTON about node PANAMA, you enter PANAMA in the blank field. Instead of the node name, you could also enter the area number to inquire about all the nodes in that area.

◆ **Note** In a large network, an area number inquiry adds a large number of nodes to your Network Data file. This inquiry takes a long time, and results in a long list displayed in your DECnet applications. ◆

5 **Click the Inquire button.**

If you entered a node name and the remote system knows about the node, the node name and address are displayed and automatically added to your node list.

If you entered an area number and the remote system knows about the area, the node names scroll in the Scanning Node field as nodes are added.

If you do not connect within 60 seconds, you can do a simple loopback test to troubleshoot your connection. See the appendix for details.

Setting a default user name and password

If there is an account to which you frequently connect on a remote node in your node list, you can set the user name and password as defaults in your node definition. After that, whenever you connect to this node, you connect automatically to the login directory of the default account.

To set a default user name and password:

1 **Click the Node Definitions button in the View/Update Parameters dialog box.**

The Node Name Management dialog box is displayed.

2 **Select the desired node from the node list.**

3 **Enter the user name, password, or both.**

If you leave the user name and password fields blank, you must enter the information each time you connect to this node.

◆ **Note** If you set a default password, anyone who can access DECnet applications on your Macintosh can gain access to the account on the remote system. ◆

4 **Click the Change button.**

5 **Click the Finished button.**

The changes are now in effect.

Setting a node's default device and directory

If there is a device or directory to which you frequently connect on a remote node in your node list, you can set that device or directory as a default in your node definition. After that, whenever you connect to this node, you connect automatically to the default device or default directory or both.

To set up device and directory access:

1 **Select the desired remote system from the node list in the Node Name Management dialog box.**

2 **Enter the name of the device and directory.**

If you leave the device and directory fields blank, you connect to the login directory of the account for the user name that you enter.

Table 2-2 provides examples of default settings. Note that you can enter VMS subdirectories without brackets. You can also enter ULTRIX directories and MS-DOS paths without backslashes.

Table 2-2 Examples of default device and directory settings

Example	Display	Default
VMS public directory	Default device:	`DISK1`
	Default directory:	`EVE.PUBLIC`
VMS subdirectory	Default device:	`DUA2`
	Default directory:	`.WORK.FULL`
ULTRIX directory	Default device:	`DISK1`
	Default directory:	`.work.full`
MS-DOS path	Default device:	`C`
	Default directory:	`\work\full`

3 **Click the Change button.**

4 **Click the Finished button.**

The changes are now in effect.

Setting up access without passwords for another user

You can set up remote access without passwords, called proxy access, to the files on your Macintosh computer. You can set proxy access for yourself (from your VMS account) and one other remote user per remote system. The user who has proxy access can copy the files on your Macintosh without typing an access control string (a user name and password).

Proxy access is also used in command procedures. It allows a system operator to back up your Macintosh from a remote system without having to store a user name-password combination. See Chapter 6, "Backing Up Files," for examples of proxy access in backup procedures from remote systems.

To set up proxy access:

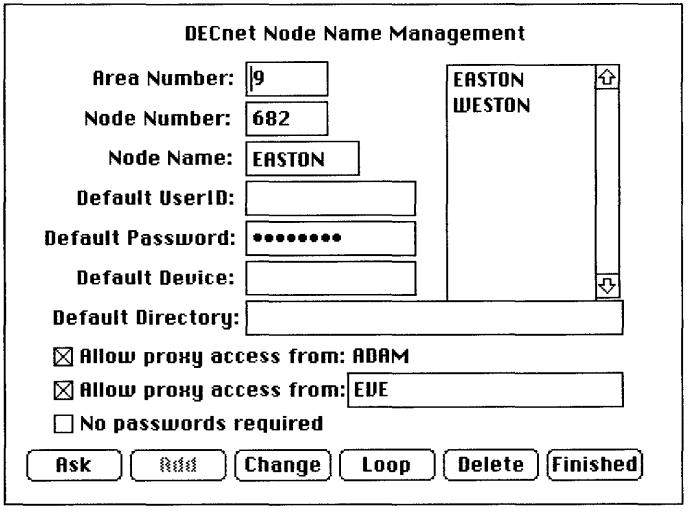
1 **Select the remote node from the node list in the Node Name Management dialog box.**

If you are the remote user, select the node on which your VMS account is located.

2 **Click the appropriate proxy access checkboxes.**

Click the first proxy access checkbox to open access to your Macintosh files from your VMS account on the remote system.

Click the second proxy access checkbox to open access from another user's VMS account on the remote system. Type the name of the user for whom you want proxy access.



3 **Click the Change button.**

4 **Click the Finished button.**

The changes are now in effect.

Setting up access without passwords for all users

You can allow DECnet users to access your files without passwords by setting up your Macintosh for open use.

To set access without passwords:

1 **Select your node from the node list in the Node Name Management dialog box.**

2 **Click the "No passwords required" checkbox.**

Clicking the "No Passwords Required" checkbox grants complete read, write, execute, and delete access to all files on your Macintosh computer.

3 **Click the Change button.**

4 **Click the Finished button.**

The changes are now in effect.

Deleting unused node names

You can delete the node names that you do not use.

To delete a node name:

1 **Click the Node Definitions button in the View/Update Parameters dialog box.**

The Node Name Management dialog box is displayed.

2 **Select the node that you want to delete from the node list.**

Shift-click to select more than one node at a time.

3 **Click the Delete button.**

The deletion takes effect when you click the Finished button.

3 Accessing Network Files

This chapter describes the ways you can access and manipulate network files on your Macintosh computer.

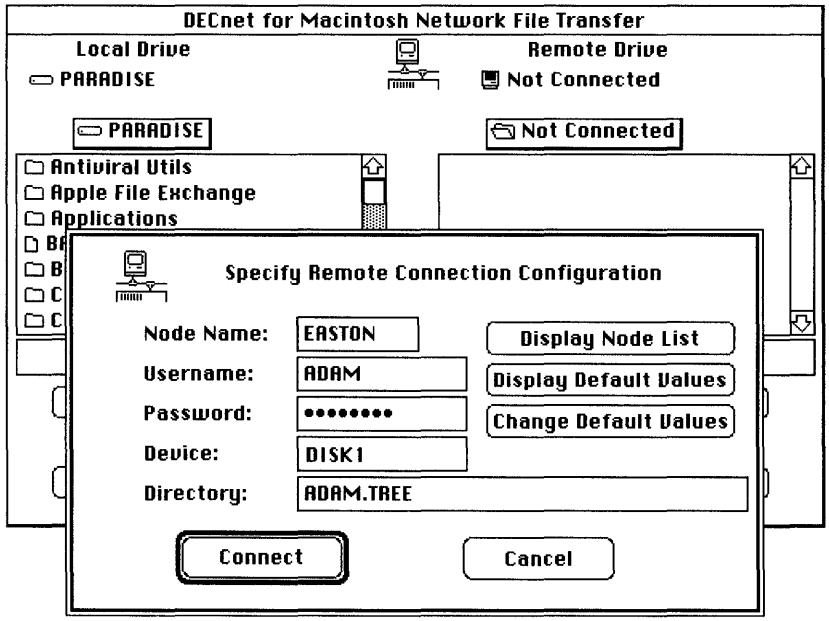
Connecting to a remote system

This section describes how to connect to a remote system to access, copy, and print either single files or groups of files anywhere on the network directly from your Macintosh computer.

To connect to a remote system:

1 **Start NetCopy by double-clicking the program icon or by selecting the icon and choosing Open from the File menu.**

When you run NetCopy, the Specify Remote Connection Configuration dialog box is displayed in front of the Network File Transfer dialog box.



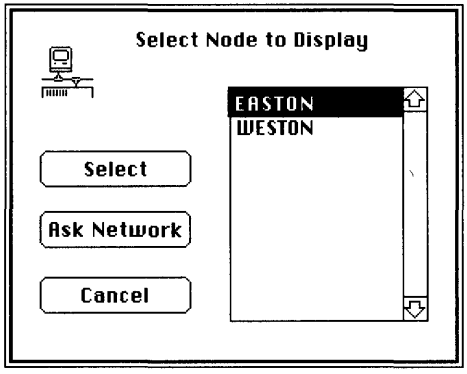
The Specify Remote Connection Configuration dialog box contains any default information entered in NCP. Use this dialog box to specify login information required by the remote system.

2 Click the Display Node List button.

The node list for the DECnet for Macintosh file utility is displayed.

3 Select the node to which you want to connect

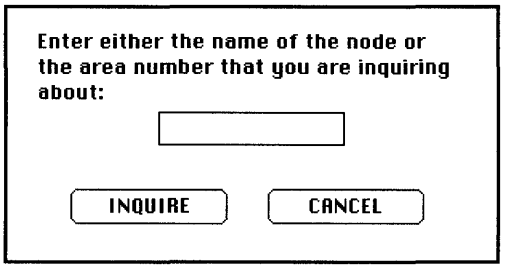
You can select a node in either of two ways: from the list of nodes or by asking the network.



To select from the list of nodes, select a node from the list and click the Select button. This returns you to the Specify Remote Configuration dialog box where you see the default information for the selected node. If you have previously stored a default user name and password, that information is also recalled.

To ask the network, select the remote system through which you want to ask about a new node and click the Ask Network button. Your Macintosh computer indicates that it is trying to connect to a remote system. You can press ⌘-period to cancel the connection.

When a connection is made, the following dialog box is displayed.



4 **Enter the node name or area number of the node about which you are inquiring.**

For example, since you are asking through node EASTON about node PANAMA, you would enter PANAMA in the blank field.

5 **Click the Inquire button.**

If you entered a node name and the remote system knows about the node, the node name and address are displayed and automatically added to your node list.

If you do not connect within 60 seconds, you can do a simple loopback test to troubleshoot your connection. See the appendix for details.

For more information, see "Asking a Remote System About Other Nodes" in Chapter 2.

6 **Change the node information as necessary.**

You can connect to a remote system in two ways: as a registered user or a guest. In either case, you can use the default information that was entered for the remote node, or you can change it before connecting.

To connect as a registered user, you must have an account and a password on the system to which you are connecting. Your system administrator can help you register on a system to which you can connect.

◆ **Note** The password is represented by a series of eight dots. The number of dots represents the length of the password only when you first enter the password but not when the password field is displayed after that. ◆

To connect as a guest, you should know the name of a public directory to which you have permission to connect. Your system administrator can give you this information.

7 **Click the Connect button.**

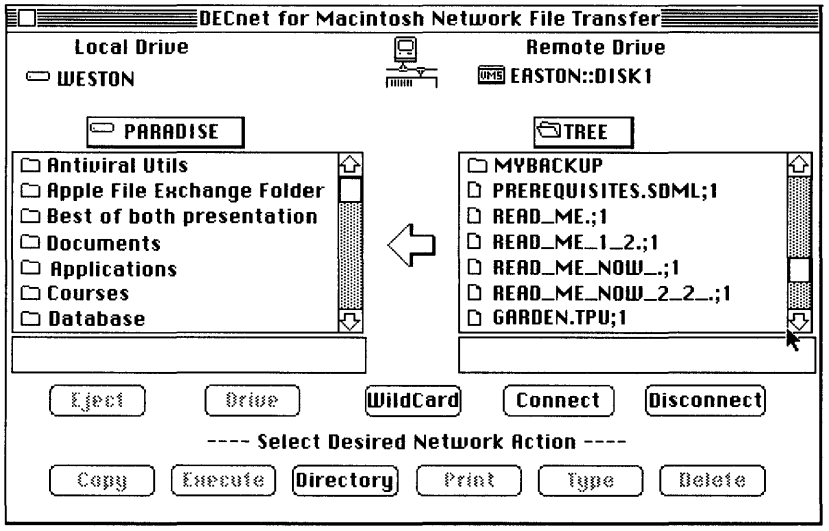
After you click the Connect button, the following window appears, indicating that the connection to the remote node is pending:

Typically you should have to wait only a few seconds. The amount of time depends on the amount of activity on the network. The pie chart graphic indicates the length of the delay.

If the connection is successful, the dialog box disappears and the beach ball cursor is displayed with the Network File Transfer dialog box again in view.

If the connection is delayed, the cursor changes to a Command-period symbol. (⌘.) When the ⌘. cursor is visible, you can cancel the connection by pressing Command-period. After 60 seconds, the clock times out and you can either try again or select another node.

If a connection is established, the login directory is displayed in the scrolling window on the right side of the Network File Transfer dialog box, as shown in the following figure:



If you do not connect within 60 seconds, you may have to troubleshoot your connection. See the appendix for details.

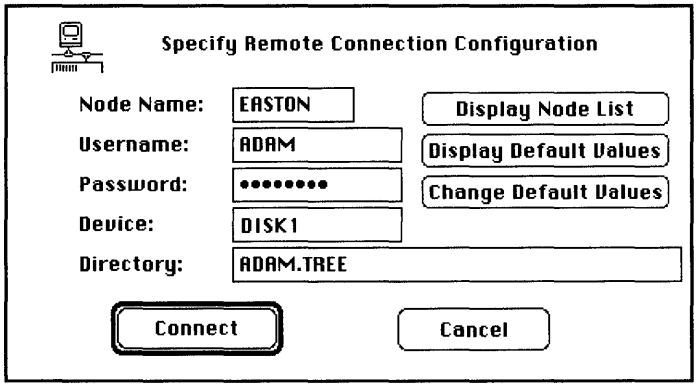
Changing a connection

When you connect to another system, NetCopy automatically breaks your previous connection. You can either change a connection or quit.

To change a connection:

1 **Click the Connect button in the Network File Transfer dialog box.**

The Specify Remote Connection dialog box is displayed.



2 **Click the Display Node List button.**

The Select Node to Display dialog box appears.

3 **Select the system to which you want to connect from the node list.**

The Specify Remote Connection dialog box is displayed.

4 **Enter the information you typically use to access this system.**

5 **Click the Connect button in the Specify Remote Connection dialog box.**

If the connection is delayed, the cursor changes to ⌘., and you can cancel the connection by pressing Command-period.

When the cursor changes to a rotating beach ball, the beach ball spins a number of times and the drive and file names are displayed in the window on the right side of the Network File Transfer dialog box.

Accessing Files

This section describes the ways you can access and manipulate network files from your Macintosh computer over DECnet including:

- Using the Network File Transfer dialog box
- Obtaining a directory of files (remote system only)
- Displaying files
- Copying files
- Printing files
- Using wildcards
- Submitting and executing procedure files
- Deleting files

About the Network File Transfer dialog box

After you have successfully connected to another system, you see the main Network File Transfer dialog box (see Figure 3-1).

The dialog box contains two scrolling windows with an arrow icon between them. The scrolling window on the left shows you the local files on your Macintosh computer. The current local drive is displayed above the scrolling window on the left. To choose a different drive (if one is connected to your Macintosh), click the Local Drive icon.

The scrolling window on the right shows you the files on the remote DECnet system to which you are connected. The files in the topmost folder are displayed in the scrolling window. The folder and file icons indicate folder and file names.

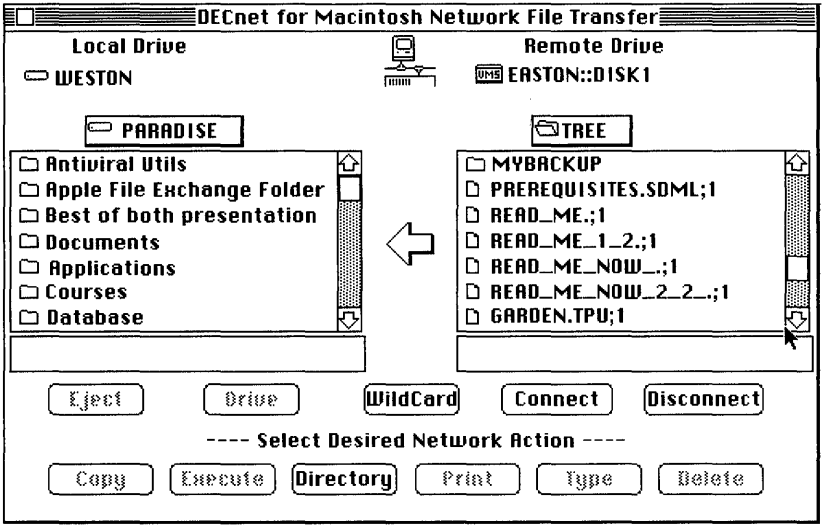


Figure 3-1 The Network File Transfer dialog box

The arrow icon shows the direction of the transfer. To select one of the scrolling windows, click anywhere in the window or on the folder name box at the top of the scrolling window. The file system of the remote system is displayed. For example, the directory structure of an ULTRIX system is shown at the left.

To display the files found at any level, click in the folder name box and hold down the mouse button. Releasing the mouse button while clicking a folder or drive icon displays the files at that level. If you do not have permission to read a folder, you see an X through the folder icon indicating that you cannot directly access that folder's information through the NetCopy utility.

Obtaining a directory of files on a remote system

This section describes how to list a directory of files on a remote system.

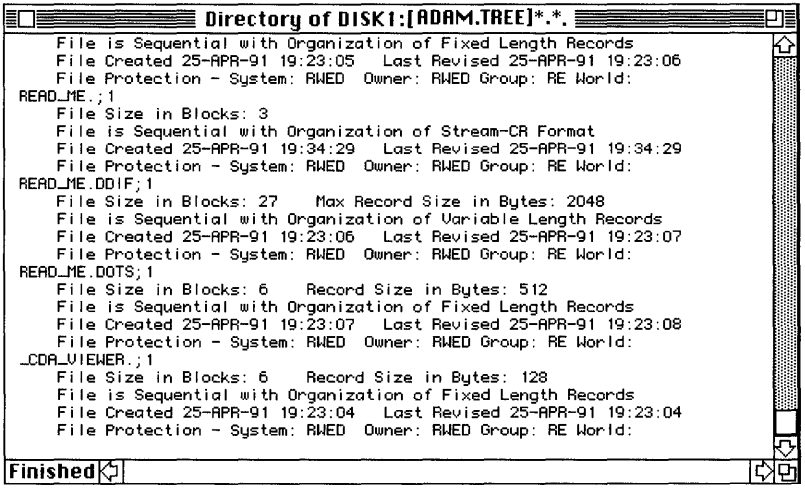
To obtain a directory of files on the remote system:

1 **Click anywhere in the Remote Drive scrolling window of the Network File Transfer dialog box.**

2 **Click the Directory button.**

NetCopy displays a list of files by name. When you click the directory button, you receive either a brief or full list, according to what you select from the Options menu.

For example, if you select a full listing of the files in EASTON::DISK1:[ADAM.TREE], the following directory is displayed.



When NetCopy finishes displaying the list of files, the Finished message is displayed in the message box in the lower left corner of the window.

Displaying files

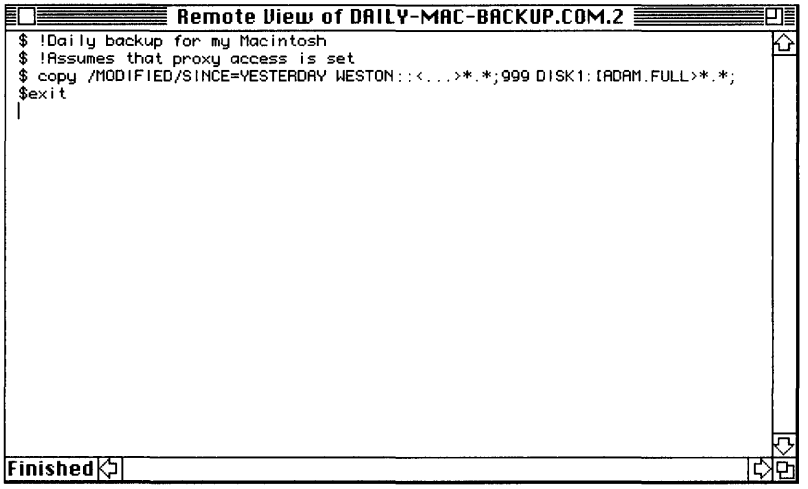
To display a file:

1 **Select a file by clicking on its name in the Network File Transfer dialog box.**

You can select more than one file at a time by holding down the Shift key as you click on the name of each file.

2 **Click the Type button.**

For example, if you select the file DAILY-MAC-BACKUP.COM.2, NetCopy displays the file in a separate window:

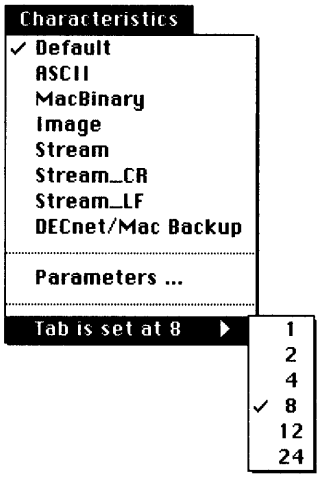


When NetCopy finishes displaying the file, the Finished message is displayed in the message box in the lower left corner of the window.

Although the number of characters scrolled is limited to 32,000, remote files are scrolled 32,000 characters at a time until they are complete. If the file is greater than 32,000 characters, the message box displays `>32K` followed by `Finished`.

The following notes apply to the Type button:

- When you select the "Tab is set at *x*" option from the Characteristics menu, a pop-up menu with tab settings is displayed. From this menu, you can change the default tab settings used by the Type button to display remote files.



- NetCopy ignores tabs for local files displayed after you click the Type button.
- To cancel the display of the file in progress, press Command-period.
- To obtain a dump of a file formatted in hexadecimal characters, choose Hex Dump Type Files from the Options menu. The Type button changes to the Dump button. A hexadecimal dump is useful for detecting characters that are not displayed in text files.

Copying files

From the Network File Transfer dialog box, you can copy files in either direction between your Macintosh computer and the remote system.

To copy files:

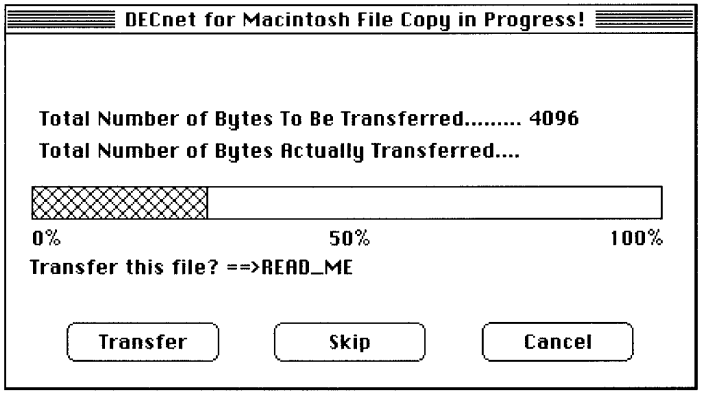
1 **Click the arrow icon to select the direction of the copy.**

You can also click anywhere in the scrolling window of the system from which you are transferring files. By clicking in the scrolling window, you cause the arrow to change direction.

2 **Select the files you want to copy.**

3 **Click the Copy button.**

The DECnet for Macintosh File Copy dialog box is displayed.



If you selected the Ask Me First option from the Options menu, you see a message in the dialog box before each file is transferred.

If a message is displayed, click the Transfer button to confirm that you want to copy the files. You can also choose to skip or cancel a file from this window.

Printing files

You can print the currently selected file from either scrolling window in the Network File Transfer dialog box. Local files are printed on the currently selected remote printer. Remote files are printed on a local printer connected to your Macintosh. For more information see the section "Selecting a Print Server," in Chapter 3 of the *Using Network Services* part of this binder.

To print selected files:

1 **Select files in either scrolling window.**

2 **Click the Print button.**

A local file is printed on the SYS$PRINT queue of the remote system.

A file on the remote system is printed on your local printer. For other ways to print your file, see Chapter 3, "VAXshare Print Services," in the *Using Network Services* part of this binder.

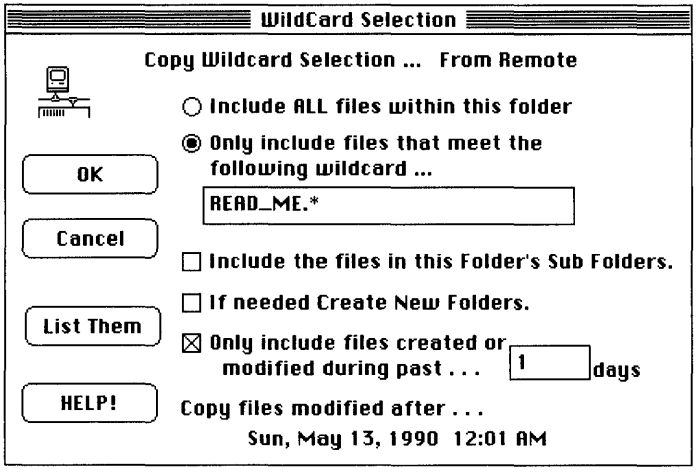
You can cancel by pressing Command-period.

Using wildcards

In NetCopy, you can use wildcards to specify different groupings of files. A wildcard, a special character used in searches, stands for all of the characters of a file name or for just some of them.You can enter wildcards

- from the Network File Transfer dialog box
- in the WildCard Selection dialog box

Click the WildCard button to display the WildCard Selection dialog box, as shown in the following figure. This dialog box makes wildcards easier to use.



The rules for wildcards are as follows:

- Entering `*` matches one or more characters.
- Entering `%` matches a single character.
- Entering `_` (underscore) matches the same characters as the percent symbol.

For example, when you access a VMS system,

- entering `*.*;*` selects all files within a given directory.
- entering `*.PAS` selects only the most recent version of files that have the suffix of `.PAS`.
- entering `*.%AS` finds any file with a three-character suffix ending in `AS`.

DECnet for Macintosh treats the underscore character (_) the same as the percent symbol (%) on inbound connections. The implementation of wildcard characters is always left up to the host (remote) system implementation.

To group files by using wildcards:

1 **Click the Arrow icon in the Network File Transfer dialog box to select the direction of the copy.**

◆ **Note** The wildcard expression applies to the files on the system from which you are copying. ◆

2 **Click the WildCard button.**

The WildCard Selection dialog box displays the options.

3 **Click the options you require.**

4 **Enter the wildcard expression.**

◆ **Note** Clicking the Help button displays brief descriptions of the wildcard characters. ◆

5 **Click the List Them button.**

NetCopy displays a list of files in a separate window.

◆ **Note** Use the List Them button to confirm that your expression correctly selects the files. This action allows you to avoid mistakes before you perform any action over the network such as copying or deleting files. ◆

If the wrong selection is displayed, click the Cancel button to return to the Network File Transfer dialog box. You can now click the WildCard button again and repeat the previous steps.

If you are satisfied with the files grouped by the wildcard, click the OK button. The wildcard expression is now displayed in a field below the scrolling window to which you are copying files. The WildCard button flashes repeatedly on the Network File Transfer dialog box when wildcard use is enabled.

Clicking the OK button does not perform any network action. It enables wildcard operations for the next network action, whether copying, deleting, typing, or executing files.

6 **Perform the desired network action from the Network File Transfer dialog box.**

You can now perform the action (such as copy or delete) on the files grouped by the wildcard.

You must re-enable wildcard use each time you perform a network action. You can cancel a wildcard that is in effect by

- clicking the WildCard button and then clicking Cancel
- clicking the Arrow icon in the Network File Transfer dialog box

If you specify a wildcard string, it must be in a format supported by the remote system. DECnet for Macintosh nodes support most of the standard VMS wildcard characters.

Submitting and executing procedure files

You can use Digital Command Language (DCL) files to perform the following programming tasks from the Network File Transfer dialog box:

- Submit a command procedure from the local Macintosh computer to run on the remote VMS system.
- Execute DCL command procedures on the remote VMS system.

To run a local command procedure from the Network File Transfer dialog box:

1 **Name the command procedure as a text file with a .COM extension.**

2 **Click the name of the .COM file in the local scrolling window of the Network File Transfer dialog box.**

3 **Click the Submit button.**

The file is copied to the VAX computer and submitted.

To run a remote procedure from the Network File Transfer dialog box:

1 **Click the name of a .COM file in the Remote scrolling window.**

2 **Click the Execute button.**

The file is executed on the VAX computer.

The most useful kind of DCL command procedure for the NetCopy environment notifies you when it is executed or submitted. The sample .COM file in Chapter 4 illustrates how to write this kind of procedure.

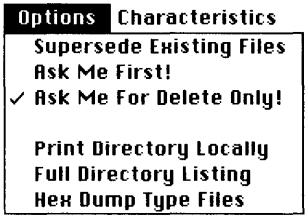
Deleting files

To delete selected files on your system:

1 **In the Network File Transfer dialog box, select the files to be deleted.**

Hold down the Shift key to select more than one file.

You can delete either local or remote files and directories (folders). Directories can be deleted only if they are empty. You can enable or disable warning messages from the Options menu.



△ **Important** You can prevent accidental deletions by enabling warning messages. To enable messages, select either the Ask Me First! or the Ask Me For Delete Only! option from the Options menu. △

2 **Click the Delete button.**

If you have enabled warning messages, you can also skip or cancel a file from this window.

In addition to deleting files, you can rename and make other changes to files directly from NetCopy. For more information, see Chapter 5.

Disconnecting from a remote system

To disconnect from a remote system:

1 **Click the Disconnect button in the Network File Transfer dialog box.**

The Specify Remote Connection dialog box is displayed.

2 **Click the Cancel button.**

The Network File Transfer dialog box is displayed.

3 **Click the Close box to quit the NetCopy program.**

4 Accessing Macintosh Files From Other Computers on DECnet

This chapter describes how to access your Macintosh files from remote nodes. Any computer connected to a DECnet network can access the files on your Macintosh computer if you allow it to do so.

In the following examples, a VMS user accesses files on a Macintosh computer. You can also access Macintosh files from a DOS-based system, an ULTRIX system, or any other computer system connected to your DECnet network.

Any DECnet computer user who wants to access your Macintosh computer must use one of the following access methods:

- A user name and password combination
- A device and directory (public directory)
- Proxy access allowed
- A system without passwords (No Passwords Required option)

These access methods are set up for each Macintosh system through the NCP application. To access a particular node, check with the user of that Macintosh computer.

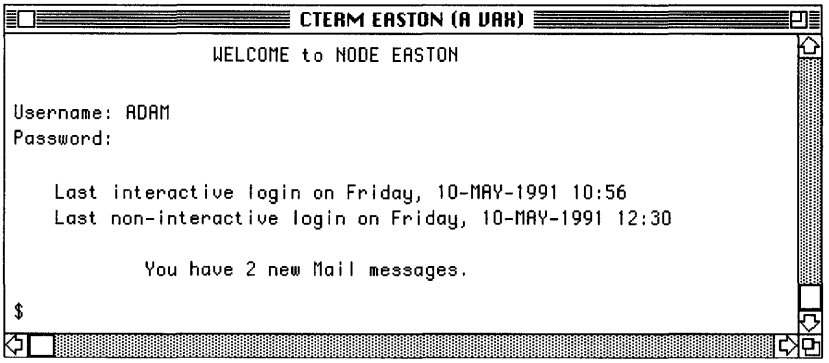
Viewing a directory of Macintosh files from a remote node

The following example shows how a VMS user can obtain a directory listing of files on your Macintosh computer. In this example, the name of the node to be accessed is WESTON and the folder to be accessed is the Chaos Games folder, which resides inside the Fractal Toolkit folder.

To obtain a directory:

1 **Log in to the VAX computer with your user name and password.**

The following example shows a login screen displayed in a CTERM window on your Macintosh computer:



2 **Enter a DCL command using the following syntax:**

```
$ DIRECTORY node::device:[directory.subdirectory]/qualifier
```

For example:

```
$ DIR WESTON::PARADISE:[FRACTAL_TOOLKIT.CHAOS_GAMES]/SIZE/DATE
```

Because this example assumes that proxy access has been set up for the user name and password of your account, no user name and password is embedded in the DCL command.

This command obtains a listing of all files located in the Chaos Games folder for the remote node WESTON.

The parts of this DCL command are as follows:

Parameter	Description	Example
`$`	VMS prompt character	`$`
`DIRECTORY`	DCL command verb	`DIR`
`node::`	Name of your Macintosh computer	`WESTON::`
`device:`	Name of the disk (usually the name of the Macintosh hard drive)	`PARADISE:`
`[directory`	Name of a top-level folder on the Macintosh computer (Spaces in the folder name must be replaced with underscores.)	`[FRACTAL_TOOLKIT`
`.subdirectory]`	Name of a subfolder on the Macintosh computer (Spaces in the folder name must be replaced with underscores.)	`.CHAOS_GAMES]`
`/qualifier`	Optional DCL command to display additional fields in the directory listing. See the VMS documentation for more information.	`/SIZE/DATE`

Spaces in Macintosh file names translate to underscores in VMS file names. For example, Fractal Toolkit on the Macintosh becomes Fractal_Toolkit in a VMS directory of Macintosh files.

The resulting directory listing looks like this:

```
Directory WESTON::PARADISE:[Fractal_Toolkit.Chaos_Games]

Chaos_Game_Sampler          5  16-MAY-1989 06:40:01.00

IFS_Study_Tool__1           2  10-JAN-1990 18:02:01.00

IFS_Study_Tool__2           4   1-JAN-1990 21:06:12.00

The_Chaos_Game              1  10-JAN-1990 19:42:19.00
```

Copying files from a VMS system to a Macintosh computer

The following example shows how you can copy a VMS file to a remote Macintosh computer. In this example, the name of the file is SQUARES.PAS, the device name is DR0:, the node to be accessed is WESTON, the user name is ADAM, and the password is KNOWLGE.

Without proxy access, the remote user needs to embed a user name-password combination in the DCL command. A user who has proxy access does not need to specify this information.

To copy a file:

1 **Log in to the VAX computer with your user name and password.**

2 **Enter the following DCL command using the following syntax:**

```
$ COPY file<return>

_To: node"username
password"::device:[directory]destination_file
```

For example:

```
$ COPY SQUARES.PAS<return>

_To: WESTON"ADAM KNOWLGE"::DR0:[EXAMPLES]SQUARES.PAS
```

After entering this command, you find a file called SQUARES.PAS in the Examples folder on the remote node WESTON.

The parts of this DCL command are as follows:

Parameter	Description	Example
`$`	VMS prompt character	`$`
`COPY`	DCL command verb	`COPY`
`file`	Name of the file that you want to copy from the Macintosh to the system you are logged into	`SQUARES.PAS`
`_To:`	VMS prompt displayed on the continuation line of a copy command	`_To:`
`node`	Name of the node to which you want to copy	`WESTON`
`"username`	Remote access username	`"ADAM`
`password"::`	Remote access password	`KNOWLGE"::`
`device:`	Name of the disk to which you want to copy	`DR0:`
`[directory]`	Name of a top-level folder on the Macintosh computer	`[EXAMPLES]`
`destination_file`	Name of the file to which you want to copy on the destination system (the one to which you are logged in)	`SQUARES.PAS`

You can use most DCL commands and VMS programs with files transferred to your Macintosh computer. If you create a new file on the Macintosh, you need to be aware of the lack of support for file version numbers.

You can access a TEXT type file on your Macintosh through the EVE or any VMS utility, but when you are finished, you must create a new copy of the file with a different name (TEST1 instead of TEST) because Macintosh files do not support version numbers.

Refer to *Writing Real Programs in DCL* (Digital Press) for more information.

Searching remote nodes

The search routines in this section are typical of a wide range of search actions you can perform using DCL commands.

Example 1

To search for a remote Macintosh file or for a file that contains a certain text-string from a VMS system, use the DCL SEARCH command with the following syntax:

```
$ SEARCH node::device:[directory]file search-string
```

The Macintosh computer has been set up with the No Passwords Required option in NCP. The No Passwords Required option in this case allows any user on any remote DECnet node to search the files on this Macintosh node without embedding a user name-password combination in the DCL SEARCH command.

In the following example, you search the Macintosh folder (directory) named Fractal Toolkit for lines containing the text string "FRACTAL."

To find lines that meet these criteria:

1 **Log in to the VAX system using your user name and password.**

2 **Enter a DCL command with the following syntax:**

```
$ SEARCH WESTON::[FRACTAL_TOOLKIT]*.* "FRACTAL"
```

The output from a sample search command is as follows:

```
****************************

WESTON::PARADISE:[Fractal_Toolkit]BIBLIOGRAPHY

B[1]: Barnsley, M., Fractals Everywhere, Academic Press,1989

D[1]: Devaney, R., Chaos, Fractals and Dynamics:

K[1]: Kaye, B., A Random Walk Through Fractal Dimensions,
VCH. 1989
```

```
M[1]: Mandelbrot, B., The Fractal Geometry of Nature,
Freeman,1982

P[2]: Peitgen, H.-O. & Richter,P., The Beauty of Fractals

P[3]: Peitgen, H.-O. @ Saupe, D., The Science of Fractal
Images

****************************

WESTON::PARADISE:[Fractal_Toolkit]Read_me

in a format that Fractals can use.
```

Example 2

To list the remote Macintosh folders and files from a VMS system, use the DCL DIRECTORY command. You can use the VMS wildcard function to extend the capabilities of the directory command.

In the following example, you search the directory of any top-level folder whose name starts with the letters "FR."

To find files that meet these criteria:

1 **Log in to the VAX system using your user name and password.**

2 **Enter a DCL command with the following syntax:**

```
$ DIR WESTON"ADAM KNOWLGE"::[FR*]/SIZE
```

The following is an example of the output that is displayed:

```
Directory WESTON"adam password"::PARADISE:[Fractal_Toolkit]

Chaos_Games.DIR 1

Empty_Folder.DIR 1

Fractal_Toolkit_Instructions 11

Iterated_Quadratics.DIR 1
```

```
Linear_Fractals.DIR 1

Mandelbrot___Julia_Sets.DIR 1

Total of 6 files, 16 blocks.
```

Example 3

To obtain a listing of the number of directories and files and the total number of blocks taken up on the remote Macintosh system, use the DCL DIRECTORY/GRAND_TOTAL/SIZE command. This example assumes that proxy access is enabled for the remote user who accesses the files on the Macintosh node WESTON.

To obtain the listing:

1 **Log in to the VAX computer using your user name and password.**

2 **Enter a DCL command with the following syntax:**

```
$ DIRECTORY/GRAND_TOTAL/SIZE WESTON::[...]
```

The output displays the total directories, file size, and block size (in 512-byte blocks) of the files that meet the search criteria, for example:

```
Grand total of 110 directories, 1258 files, 66321 blocks.
```

Refer to *Writing Real Programs in DCL* (Digital Press) for further information on allowable file specifications.

Using command procedures with NetCopy

This section demonstrates how you can create a DCL command procedure to run from the Network File Transfer dialog box, either locally or remotely. A sample procedure follows:

```
$ set noon ! Set no "ON" condition,
$ ! do not go to exit if there's an error
$ def sys$error temp.temp
$ set def EDEN:[ADAM.TEXTS]
$ show def
$ SEARCH WESTON::PARADISE:[FREETEXTS]*.TXT "SUBJ:" -
/OUTPUT=QRY.TEMP
$ our_status = f$message($status)
$ mail qry.temp ADAM/subject="Search list with
''our_status'"
$ purge qry.temp
$ purge temp.temp
$ exit
```

This procedure searches all the files in a remote VMS directory for the string "SUBJ:" by executing the line:

```
$ SEARCH WESTON::PARADISE:[FREETEXTS]*.TXT "SUBJ:" -
/OUTPUT=QRY.TEMP
```

To work with NetCopy, the sample .COM file includes lines that

- handle simple errors:

```
$ set noon ! Set no "ON" condition,
$ ! do not go to exit if there's an error
$ def sys$error temp.temp
```

- capture the result in a temporary output file:

```
$ SEARCH WESTON::PARADISE:[FREETXTS]*.TXT -
"SUBJ:"/OUTPUT=QRY.TEMP
```

- get the status:

```
$ our_status = f$message($status)
```

- mail the result and the status to you:

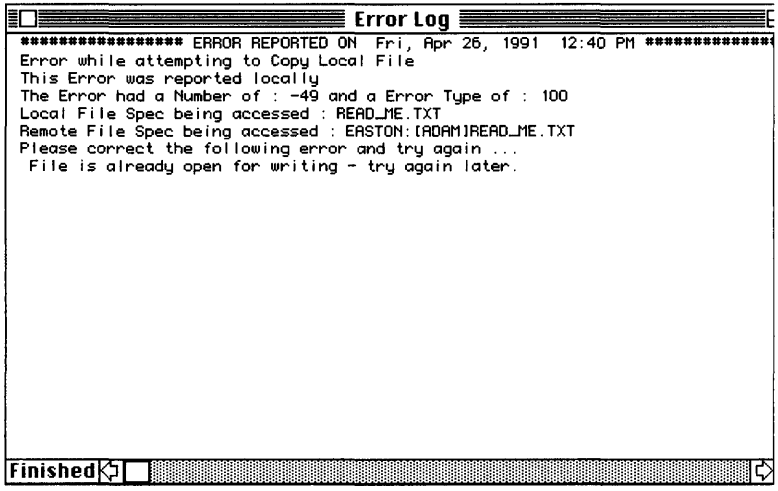
```
$ mail qry.temp ADAM/subject="Search list with
''our_status'"
```

- clean up:

```
$ purge qry.temp
$ purge temp.temp
$ exit
```

The sample procedure then notifies you of its result by sending you mail:

- If your command procedure has errors, it does not run to completion and the procedure does not mail you the results of the query.
- If an error message is displayed, choose the Show Error Window in the Window menu and take the recommended corrective action. For example, the Show Error Window might display the following message:



- If no error message is displayed, the Show Error Window option in the Window menu is dimmed and is not accessible.

To troubleshoot your DCL command procedures, follow the instructions for debugging DCL command procedures in *Writing Real Programs in DCL* (Digital Press).

5 Transferring Files

This chapter describes how to transfer files between your Macintosh computer and other computers connected to a DECnet network.

Overview of DECnet file transfers

Most files convert automatically between your Macintosh computer and other computers connected to a DECnet network. However, from time to time, you may have to obtain more information about the types of files you are transferring.

The names of the five Macintosh file types (and their VMS counterparts) mentioned throughout this chapter are

- TEXT (text)
- BINA (fixed length)
- VARI (variable length)
- STRM (stream)
- STLF (Stream LF)

The following examples illustrate when you might need more information about the files you transfer between systems.

Example 1: Binary file transfer

When you transfer a file from a spreadsheet on the Macintosh to a report generator on the VAX, you may want to retain the same formatting at both ends of the file transfer process.

Example 2: Text file transfer

When you transfer a program file from a Macintosh text editor to the VMS development environment, you may want to retain the same line breaks on the Macintosh and on the VAX. The file types that you use depend on what you need to accomplish at both ends of the transfer process.

Example 3: Image file transfer

When you transfer an EXE (executable) program file from a VAX to your Macintosh computer, you depend on a form of image file transfer. Again, the method of transfer depends on the specifics of the applications.

In each of the preceding examples, to determine whether that file successfully transfers, you usually need to know more about the creator, the type, the default transfer method, or other characteristics of the file.

Getting and changing file characteristics

If you need more information about a particular file, DECnet for Macintosh software allows you to obtain this information. You can get and change the following file characteristics displayed in the File Information dialog box:

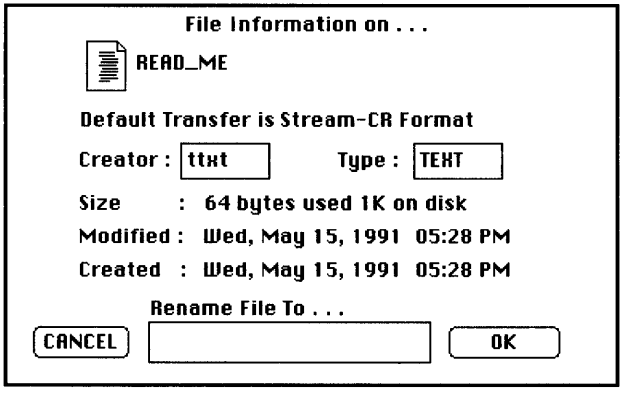
- Creator
- Type
- File name

To get or change information:

1 **Click a file in one of the scrolling windows in the Network File Transfer dialog box.**

2 **Choose Get Info from the File menu or press Command-I.**

The File Information dialog box is displayed.



The information displayed in this box depends on the selected file's system of origin. The information provided for Macintosh files is somewhat different from the information provided for VMS files.

If the file resides on another Macintosh computer, the display includes information on

- Default transfer—the method NetCopy uses to copy the file.
- Creator—for text files, the default creator type is ttxt (TeachText application); for image files, the default file type is DECB (NetCopy application).
- Type—for text files, the default file type is TEXT; for image files, the default file type is BINA.
- Size—of the buffer, in 1K segments, that is used by the file during transfer.

For most applications, DECnet for Macintosh transfers and converts files automatically using the correct file type, whether the file is text, image, or binary. The Created field shows how the file was named on the remote system. If the remote system supports file version numbers, these numbers are included in the display of files, as shown in the following example:

```
READ_ME.TXT;2

READ_ME.TXT;1
```

◆ **Note** Macintosh files do not have version numbers. ◆

3 Enter new information in the Creator and Type fields

If you make a mistake as you edit the existing fields, click the Cancel button to return the original information to the fields, and repeat Step 2.

4 Click the OK button.

Changing the default file transfer method

In a few cases, it is necessary for you to select a transfer method other than the default method. These cases include transfers of

- Non-VMS files—for example, file transfers from ULTRIX, RSX, and DOS systems require you explicitly to select the transfer type.
- Macintosh files stored in formats other than fixed-length, 128-byte format
- Text files stored in stream or stream line feed formats.

In these cases, NetCopy attempts to transfer the file according to the methods described in the section "Understanding Macintosh to VMS File Type Conversions," later in this chapter.

The transfer method you choose depends on whether you want to store the file or display it. For more information on types of files, see Chapter 2, "VAXshare File Services," in the *Using Network Services* part of this binder.

To change the default file transfer method:

1 **Click a file name in one of the scrolling windows of the Network File Transfer dialog box.**

2 **Choose Get Info from the File menu.**

The description of the file format is displayed for the selected file. Identify files that are

- types other than VMS
- types other than 128-byte fixed MacBinary format
- Stream or Stream_LF

3 **Set the option for each file in the Characteristics menu.**

If you select any file option other than Default, NetCopy attempts to process the file in the form that you request it. The supported file types are discussed in more detail in the next several sections.

4 **Click the Copy button to transfer the selected file.**

Understanding file differences

Most Macintosh files are very different from VMS files. On one hand, Macintosh files are distinct from the files of other operating systems in that they have two forks to every file:

- a data fork, which is simply a stream of bytes with no record structure imposed by the file system
- a resource fork, which is a feature specific to the file system of the Macintosh computer

On the other hand, the VMS Record Management System (RMS) supports a variety of different file and record organizations. The section, "Understanding VMS to Macintosh File Type Conversions," later in this chapter, provides more information.

Even with these very different file systems, DECnet for Macintosh transfers files from system to system with a minimum loss of file structure. For example, the data fork of a Macintosh text file is the same as a VMS Stream CR file. It is a stream of bytes with the lines of text separated by carriage return characters. The Macintosh file may also have information in the resource fork such as tab settings, font size, and font types.

This additional information stored in the resource fork is lost when files are transferred as text files. The next section explains default methods of file conversions.

Understanding Macintosh to VMS file type conversions

Table 5-1 lists the various kinds of files and the default method that NetCopy uses to convert each type from Macintosh file format to VMS file format.

Understanding VMS to Macintosh file type conversions

DECnet for Macintosh supports the transfer of both fixed-length and variable-length record files. DECnet for Macintosh stores these files in such a way that they can be copied from a Macintosh to a VMS system without loss of record structure. To accomplish this, DECnet for Macintosh uses the Macintosh resource fork to store additional record information and the file's type field to determine a method of interpreting the file data. Table 5-2 lists the VMS file types and how they are transferred.

Table 5-1 Macintosh to VMS file conversions

Macintosh file type	VMS file type
BINA	Fixed Length—record length is maintained
TEXT	Stream CR
VARI	Variable Length—no attributes
STRM	Stream
STLF	Stream LF
All others	Fixed Length—128-byte records with MacBinary contents.
ANY	Fixed Length—128-byte records with Special Backup contents.* (Created during backup only.)

*Special Backup format is not found on the Macintosh; only on VMS. Special Backup format files have Version ;999

- Fixed-length, 128-byte records with backup contents
- Format similar to standard MacBinary format but with additional information on the entire file path including all related folders

Table 5-2 VMS to Macintosh file conversions

VMS file type	Macintosh file type
Fixed length	BINA—Record structure is maintained. Records of 128 bytes are examined for MacBinary format or backup contents. If either of these two special formats is found, then the file is restored to original format and contents.
Variable length	VARI—Record structure is maintained
Variable length, implied CR/LF	TEXT (Stream CR)
Stream	STRM (no data conversion)
Stream, implied CR/LF	TEXT (CRs added if needed)
Stream LF	STLF (no data conversion)
Stream LF, implied CR/LF	TEXT (CRs added after each record)
Stream CR	TEXT (no data conversion)
Stream CR, implied CR/LF	TEXT (CRs added after each record)
Indexed Sequential Files_(ISAM)	Not supported

For example, when a fixed-length record file MYPROG.EXE is copied from VMS to a Macintosh, the file created by DECnet for Macintosh has its file type set to BINA to indicate that it contains binary image data. If the records are fixed length of 128 bytes, DECnet for Macintosh then looks at the contents of the file to determine if the file is in MacBinary format or VMS data of some unknown format. If it is a MacBinary format, DECnet for Macintosh converts the file and re-creates the original Macintosh file, registering the file creator and file type.

If the file is a type other than MacBinary format and its record size is other than the default of 512 bytes, DECnet for Macintosh stores the record size within the resource fork. DECnet for Macintosh supports fixed length records of up to 32,768 bytes in size, allowing you to back up a VAX using the Macintosh to store the save set.

Variable length ASCII files are typically stored as TEXT (stream CR) files on a Macintosh computer.

A problem occurs when these files contain variable length binary records with no specific record attributes. In this case, DECnet for Macintosh assigns a special file type of "VARI" and precedes each record with a two-byte size count for each record stored so that the records can be retrieved later. VMS files that have the extension "OBJ" are typical of this type of file.

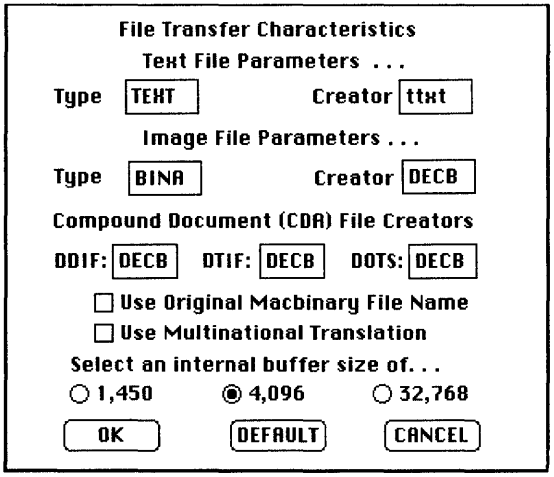
Setting up default file characteristics

You can set up default file characteristics for text files, image files, and compound documents.

To change defaults:

1 **Choose Parameters from the Characteristics menu.**

The File Transfer Characteristics dialog box is displayed.



2 **Enter the parameters you want to change.**

You can configure some of the internal defaults of NetCopy:

- Text File Parameters

  Typically, NetCopy copies text files to your Macintosh and assigns them a creator and type that correspond to the TeachText application included with DECnet for Macintosh. When you double-click these new files, they automatically launch TeachText for you. If you use another standard editor (for example, Microsoft Word), you can change the following values to correspond to those required by that application.

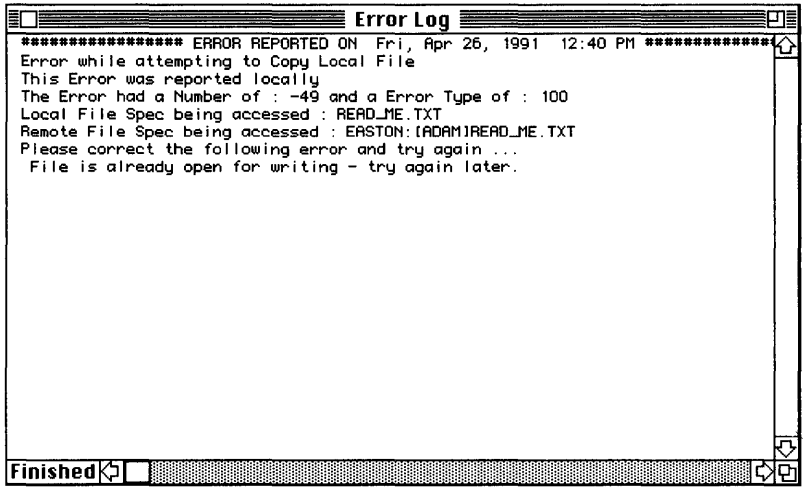
- Image File Parameters
  When DECnet for Macintosh copies image files of fixed-length records, it assigns them a creator of DECB and type of BINA unless you modify the Image File Parameters.
- Compound Document (CDA) File Creators
  For the DDIF, DTIF, and DOTS file types the default creator is DECB (a NetCopy application).
- Use Original MacBinary File Name
  When you copy a file that is in MacBinary format, you may choose to have it stored using the name it has on the remote system or the name embedded within the file itself.
- Use Multinational Translation
  Typically you should have Use Multinational Translation checked. NetCopy translates all of the characters within text files to and from the Digital Multinational Character Set whenever possible.
- Select an internal buffer size of . . .
  The 4,096K size is appropriate for most files. Use the 32,768K size for VMS save set files and other files stored in larger blocks. Use the 1,450K size when it is necessary to transfer files in small blocks over an asynchronous line.

3 **Click the OK button.**

Understanding NetCopy errors

If anything goes wrong during a file transfer or other operation, NetCopy notifies you in two ways of any error that occurs: an alert box is displayed on the screen, and the error message information is recorded in the Error Log window.

The Error Log window is a special window where errors are logged during your NetCopy session. Even after clicking the Close box, you can recall the Error Log window by using this menu.

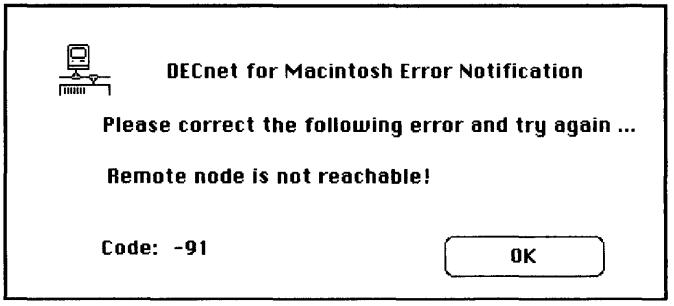


If no errors have been reported, then the Error Log window option is dimmed.

Both the alert box and the Error Log window contain the following information:

- a primary error message telling you the category of the error
- a secondary message giving you more specific information
- an error code that further classifies the error

In the following example, a network copy was in progress when the network link was terminated, forcing the link with the remote node to be broken.



This specific error indicates an error caused elsewhere in the network that was probably beyond your control.

6 Backing Up Files

DECnet for Macintosh software allows you to do network backup and restore operations. The special extension ;999 provided by DECnet for Macintosh ensures that you can restore files to their original locations. If the folder no longer exists at the time of the restore operation, NetCopy re-creates it.

Using NetCopy wildcards

Wildcards give you a useful tool with which to back up your Macintosh over the network. A wildcard is a special character used in searches to stand for all or some characters of a file name. Wildcards allow you to use a single file specification to select ranges of files, instead of having to transfer one file at a time. For example, when you backup your files using wildcards, you can specify which folders to search and what modification dates to look for.

NetCopy provides a number of ways to back up files with wildcards from the Wildcard dialog box.

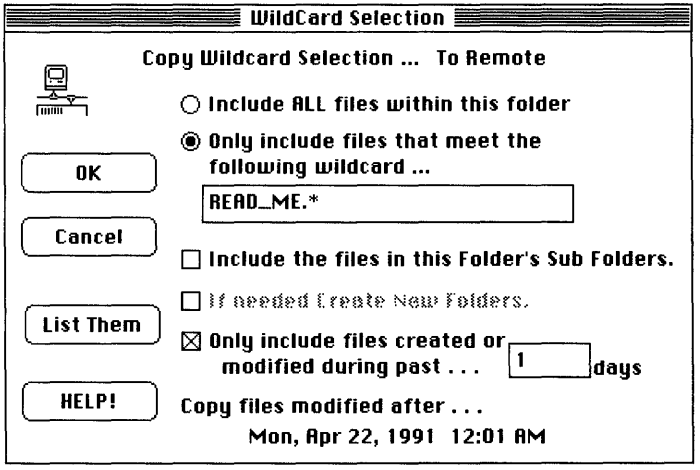
To use the NetCopy wildcards to perform backups:

1 **Start NetCopy by double-clicking the NetCopy icon.**

2 **Select the DECnet/Mac Backup option from the Characteristics Menu.**

3 **Click the WildCard button.**

NetCopy displays the WildCard Selection dialog box including any previous selections.



The heading of the WildCard Selection dialog box indicates whether the wildcard specifications apply to remote files or to local files.

4 **Click the wildcard option you require.**

By clicking the appropriate button and checkbox, you can

- Include all files within this folder.
  Clicking this button is equivalent to entering *.* in a VMS system.
- Include the files in this folder's subfolders. Click this checkbox if you want subfolders transferred under the selected folder (directory).
  Clicking this checkbox is equivalent to entering [...] in a VMS system.
- If needed, create new folders.
  If the remote system supports the creation of new directories (folders), the If Needed Create New Folders checkbox can be selected. Currently only Macintosh computers that are DECnet nodes support this feature; the selection is dimmed for all other operating systems.

  If this selection is not made, all copied files will reside in a single folder. If this selection is made for copies between Macintosh computers, DECnet for Macintosh keeps all copied files within their correct folders and creates these folders on the remote machine if necessary.
- Include only files created or modified during the past number of days that you specify.
  You can restrict your selection of files to those that have been modified during the past *n* days. NetCopy automatically displays the date as you enter the number of days.

◆ **Note** If you click this checkbox but do not enter a number of days, your wildcard selection includes only the files created since the beginning of the current day. ◆

Backing up files with DCL COPY

You can use the DCL COPY command to back up any or all of the files on the remote Macintosh computer to a specially created VMS directory.

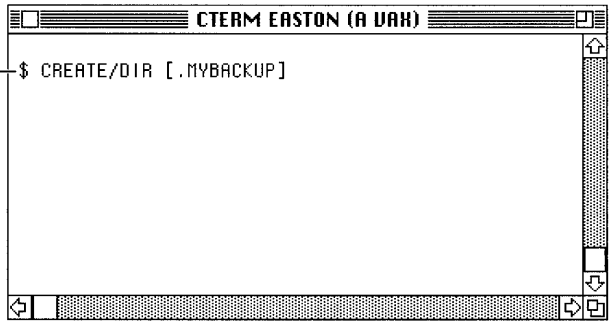
To backup files using DCL COPY:

1 **Log in to the VMS system using your user name and password.**

2 **Create a subdirectory for the files.**

For example, enter the following DCL command:

```
$ CREATE/DIR [.MYBACKUP]
```



The file is stored in special backup ;999 format in a VMS subdirectory on the VAX computer.

This command creates a local directory called MYBACKUP in which to store files.

3 **Enter a DCL command.**

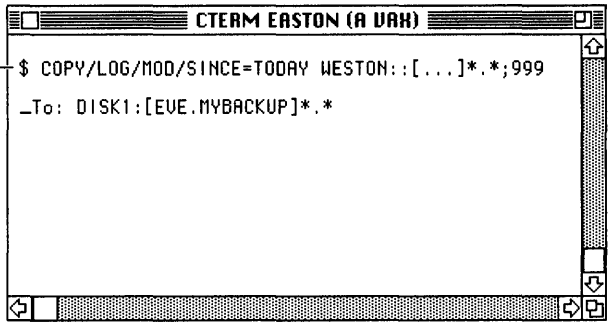
The DCL command should have this syntax:

```
$ COPY/qualifiers node::device:[...];999

_To: destination_file
```

For example:

```
$ COPY/LOG/MOD/SINCE=TODAY WESTON::[...]*.*;999

_To: DISK1:[EVE.MYBACKUP]*.*
```

The DCL command backs up all files on the remote node.



The parts of this DCL command are as follows:

Parameter	Description	Example
`$`	VMS prompt character	`$`
`COPY`	DCL command verb	`COPY`
`/qualifiers`	DCL command qualifiers	`/LOG/MOD/SINCE=TODAY`
`node::`	Name of the node from which you want to copy	`WESTON::`
`device[...]*.*`	All files in all folders on the Macintosh hard disk	`[...]*.*`
`;999`	Special backup version number that informs DECnet for Macintosh to transfer the files in a special format so that the corresponding disk and directory path are stored within the file	`;999`
`_To:`	VMS prompt displayed on the continuation line of a copy command	`_To:`
`destination_file`	Name of the file to which you want to copy on the destination system (the one to which you are logged in)	`DISK1:[EVE.MYBACKUP]*.*`

If you use the /LOG qualifier as shown in the preceding example, a log similar to the following log is displayed:

```
%COPY-S-COPIED,WESTON::PARADISE:[DOCUMENTS]CHAPTER_1;999

copied to DISK1:[EVE.MYBACKUP]CHAPTER_1;999 (35 blocks)

%COPY-S-COPIED, WESTON::PARADISE:[DOCUMENTS]CHAPTER_3;999

copied to DISK1:[EVE.MYBACKUP]CHAPTER_3;999 (196 blocks)

...

%COPY-E-OPENOUT, error opening

DISK1:[EVE.MYBACKUP]CODE_FORMAT;999 as output

 -RMS-E-FEX, file already exists, not superseded

%COPY-S-COPIED, WESTON::PARADISE:[DOCUMENTS]COVER_PAGE;999

copied to DISK1:[EVE.MYBACKUP]COVER_PAGE;999 (49 blocks)

...
```

Notice that the log file explains that the COPY command was not able to replace a file that already existed; it also notes how many new files were created in the directory.

Restoring files

This section describes how to restore a file previously backed up from a Macintosh folder to a VMS directory. The backup procedure stores pointers to restore the file to its original folder on your Macintosh.

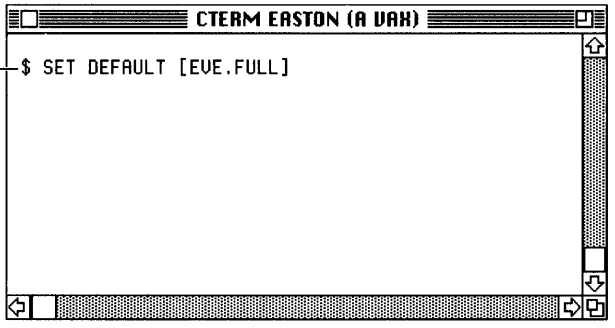
To restore a file previously backed up:

1 **Log in to the VAX computer using your user name and password.**

2 **Set default to the backup directory.**

For example:

```
$ SET DEFAULT [EVE.FULL]
```

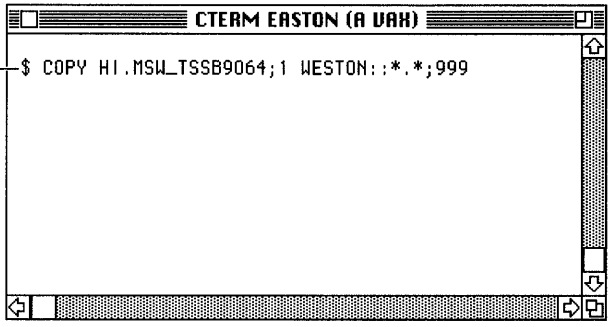


The default is set to the backup directory.

3 Restore the file by copying from the VAX computer.

Append the ;999 version number to the Macintosh file name, for example:

```
$ COPY HI.MSW_TSSB9064;1 WESTON::*.*;999
```

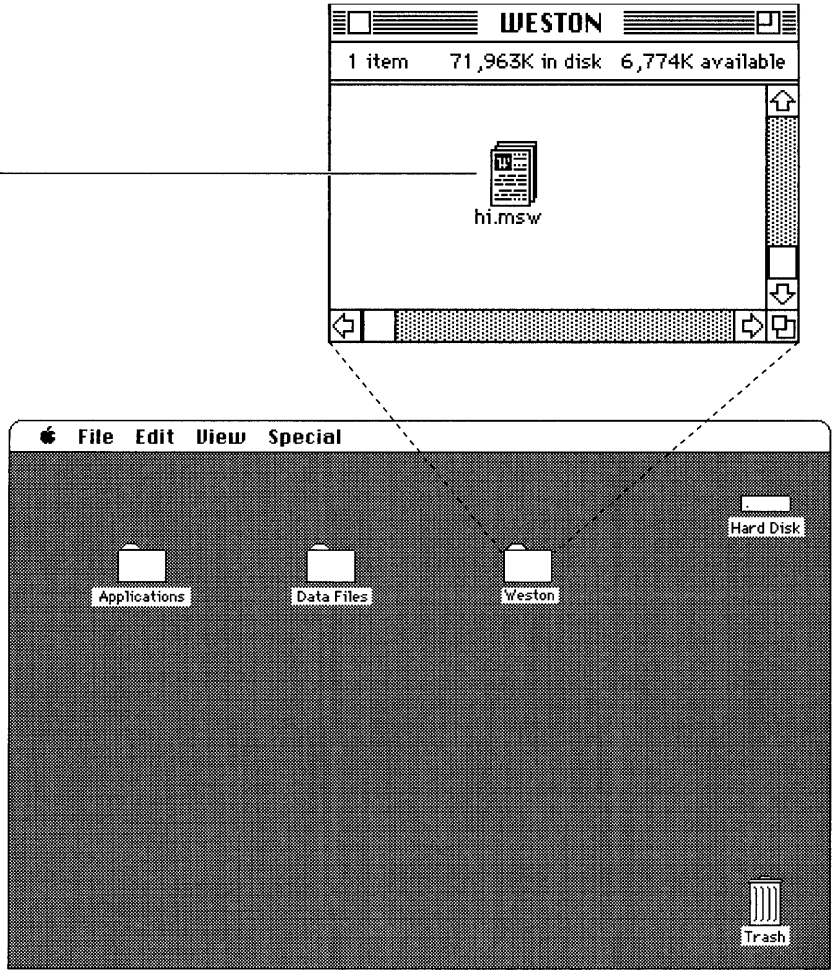


The file is copied from the VAX computer to restore it to the Macintosh computer.

The ;999 version number causes DECnet for Macintosh to restore the file to and display the file at its original location on your Macintosh.

On the Macintosh computer . . .

File is restored to its original location on the Macintosh. (If the file folder no longer exists, it is re-created.)



Performing an unattended backup

This section presents a sample procedure that uses the DECnet for Macintosh backup format to do a periodic unattended backup of a Macintosh computer from a VMS system. The command procedure file Backup-Mac.COM is found in the Examples folder on the PATHWORKS for Macintosh volume.

To perform an unattended backup of your Macintosh:

1 **Log in to the VAX computer using your user name and password.**

2 **Create an empty directory.**

For example:

```
$ CREATE/DIRECTORY...
```

If you do not specify one, the procedure copies files to your current default directory.

```
$ CREATE/DIRECTORY [EVE.FULL]
```

3 **Invoke the command procedure by entering a command of the following form:**

```
$ @Backup-Mac source destination copy-qualifier resubmit-date
```

For example:

```
$ @Backup-Mac WESTON DISK1:[eve.full_back] -
/modified/since=yesterday No
```

The parts of this DCL command are as follows:

Parameter	Description	Example
`$`	VMS prompt character	`$`
`@`	Used to invoke a DCL command procedure	`@`
`Backup-Mac`	Command procedure name	`Backup-Mac`
`source`	Node name of the Macintosh computer	`WESTON`
`destination`	The file specification for the device and directory into which files are backed up.The default is the current default directory SYS$DISK:	`DISK1:[eve.full_back]`
`copy-qualifier`	The COPY qualifiers used on the files to be backed up	`/modified/since=yesterday`
`resubmit-date`	A VMS time and date specification used to resubmit the command procedure. The default is TOMORROW+01:00, (tomorrow at 1:00 AM) To disable resubmission enter NO or NONE	`NO`

4 **List the directory.**

```
$ DIRECTORY *.* /size/date
```

The following example is a listing of the Macintosh files copied to a VMS system in an unattended backup operation:

```
CLIPBOARD_FILE_TSSB1523.;1       2  30-APR-1990 11:25:56.00

CTERM_EASTON_TSSB1658.;1        97  16-MAY-1990 17:20:47.00

MY_GLOSSARY.MSW_TSSB2198;1        45  16-MAY-1990 15:25:30.00

MY_FILE.SDML_TSSB2198;1         33  4-MAY-1990 14:05:08.00

GATEKEEPER_LOG_TSSB1523.;1        14  27-APR-1990 17:49:55.00

LASERWRITER_TSSB1523.;1        127  30-APR-1988 12:00:00.00
```

```
MY_STATUS_524.MSW_TSSB1454;1     16  24-MAY-1990 11:13:22.00
POPCHAR_TSSB1523.;1              16  21-JAN-1990 21:12:22.00
SYSTEM_TSSB1523.;1             1918  5-SEP-1989 12:00:00.00
USERLAT_TSSB1523.;1              107  22-NOV-1989 15:11:04.00
_ATM_68020_030_TSSB1523.;1       194  10-OCT-1989 17:40:23.00
Total of 11 files, 2569 blocks.
```

5 **If necessary, type the batch-job log to see if the backup was successful by entering a command in the following format.**

```
$ type Backup-Mac.log
```

Unattended backup with proxy access

This section shows an example of unattended backup by a remote VMS user who has been granted proxy access to the Macintosh files. In this example, it is assumed that user EVE has proxy access and that the backup is performed from her account.

To back up the files on Macintosh WESTON modified since yesterday, enter

```
$ @Backup-Mac WESTON DISK1:[EVE.FULL_BACK] -
/MODIFIED/SINCE=YESTERDAY
```

The only required parameter is the node name of the Macintosh computer.

If the procedure executes successfully, you receive the following messages:

```
Backing up from WESTON::<...>*.*;999

Backing up to DISK1: <EVE.FULL>*.*;

Copy options: /MODIFIED/SINCE=YESTERDAY

Resubmit for: Tomorrow+01:00
```

If you have set a password and user name for the Macintosh computer, you must enable proxy access by using the Macintosh rather than embed these in the command, or enable proxy access by using the NCP program for Macintosh. (See the section "Setting Up Access Without Passwords for Another User," in Chapter 2.)

◆ **Note** If your VMS system is part of a cluster, the batch job can run on any node in the cluster. To allow this, either define proxy access from each node in the cluster or modify the command procedure to specify the batch queue of a single node from which you have proxy access. ◆

Unattended backup on a VAXcluster

This section shows an example of unattended backup by a remote VMS user in a VAXcluster. In this example, the Macintosh user has specified proxy access for user ADAM on EASTON, but proxy access is not specified for any other node in the cluster. To omit the user name ADAM and the password KNOWLGE from the command line, the Macintosh user must specify a queue (in this case EASTON$BATCH) on the system from which ADAM has proxy access.

```
$ @Backup-Mac WESTON DISK1:[EVE.FULL]-
_$ /MODIFIED/SINCE=YESTERDAY-
_$ /queue=EASTON$BATCH

$ @backup-mac WESTON DISK1:[EVE.FULL_BACK]
Backing up from WESTON::<...>*.*;999
Backing up to DISK1:<EVE.FULL_BACK>*.*;
Copy options: /MODIFIED/SINCE=YESTERDAY
Resubmit for: Tomorrow+01:00
  .
  .
  .
Job BACKUP-MAC (queue EASTON$BATCH, entry 869) holding until
26-OCT-1990 01:00
```

Customizing your backup

This section presents the source of the sample procedure that performs an unattended backup. You can use this sample procedure to perform a daily, weekly, or one-time backup of the files on your Macintosh computer, or customize it for your own needs.

```
$! Backup-Mac.Com
$!
$! This procedure uses DECnet for Macintosh backup format
$! to do a periodic unattended backup of a Macintosh
$! computer. The Macintosh computer must be running DECnet
$! for Macintosh or TSSnet.
$!
$! Invocation:
$!
$!  @Backup-Mac source [destination] [copy-qualifier]
$!  [resubmitdate]
$!
$! Parameters:
$!
$!   source
$!
$!      The only required parameter is the node name of the
$!      Macintosh. The rest of the source file specification
$!      is defaulted as follows:
$!
$!            Field         Default
$!
$!            Device                      The system boot disk
$!            Directory     <...>         All folders
$!            File          *
$!            Type          .*
$!
```

```
$!      The version cannot be specified both because the
$!      Macintosh file system doesn't support file
$!      generations and because a version of ;999 is used by
$!      DECnet for Macintosh as a flag to indicate that the
$!      copy is to be done in backup format.
$!
$!  destination
$!
$!      The file specification of the device and directory
$!      to back files up into. The default is the current
$!      default directory SYS$DISK:<>.
$!
$!  copy-qualifier
$!
$!      The COPY qualifiers used to select the files to be
$!      backed up. The default is /MODIFIED/SINCE=YESTERDAY,
$!      to backup all files that were modified since the
$!      beginning of the day yesterday. Any valid qualifiers
$!      for the COPY command may be used. Additionally, the
$!      /ALL qualifier may be specified to indicate that no
$!      qualifiers are to be applied.
$!
$!  resubmit-date
$!
$!      A VMS time and date specification that is used to
$!      resubmit the command procedure. The default is
$!      TOMORROW+01:00,tomorrow at 1:00 AM. This results in
$!      a backup of the files created in the previous 25
$!      hours being done every 24 hours. Files created on
$!      the Macintosh between midnight and 1:00 AM will be
$!      backed up twice.
$!
```

```
$!      Resubmission can be disabled by supplying the value
$!      NO or NONE.
$!
$!  Examples:
$!
$!      To start a daily backup specify either of the
$!      following:
$!
$! $ @Backup-Mac MAC:: $DISK:[MAC] /MODIFIED/SINCE=YESTERDAY
$!   TOMORROW+01:00 or
$!      $ SET DEFAULT $DISK:[MAC]
$!      $ @Backup-Mac MAC::
$!
$!      To start a weekly full backup:
$!
$!      $ @Backup-Mac MAC:: $DISK:[MAC.FULL] /ALL "01:00+7-"
$!
$!      to do a one-time full backup:
$!
$!      $ @Backup-Mac MAC:: $DISK:[MAC.FULL] /ALL NO
$!
$ save_proc_verify = f$environment("verify_procedure")
$ save_image_verify = f$environment("verify_image")
$ set noverify
$ copy :== copy
$!
$!      Demand the source specification
$!
$get_mac:
$ if p1 .nes. "" then goto got_mac
$ inquire p1 "Please enter the name of the Macintosh to
$ backup"
$ goto $get_mac
```

```
$got_mac:
$ if f$parse (p1, "","", "node", "syntax_only") .eqs. ""
$ then -
        p1 = p1 + "::"
$ macintosh = f$parse (p1, "", "", "node", "syntax_only")
$ if macintosh .eqs. ""
$ then
$       write sys$error "Node name specification error"
$       exit 18
$ endif
$!
$!      Apply all of the parameter defaults.
$!
$ mac_file_spec = f$parse (";999", p1, "<...>*.*")
$ destination = f$parse (p2, "sys$disk:<>*.*;", "", ,
$ "syntax_only")
$ if p3 .eqs. "" then p3 = "/MODIFIED/SINCE=YESTERDAY"
$ options = f$edit (p3, "UPCASE") - "/ALL"
$ if p4 .eqs. "" then p4 = "Tomorrow+01:00"
$!
$!      Tell 'em what we're doing...
$!
$ write sys$output "   Backing up from " + mac_file_spec
$ write sys$output "   Backing up to " + destination
$ write sys$output "   Copy options: " + options
$ write sys$output "   Resubmit for: " + p4
$!
$!      And do it...
$!
$ set verify
```

```
$ if f$edit (f$extract (0, 2, p4), "UPCASE") .nes. "NO" then
-
        submit 'f$environment("PROCEDURE") -
                /parameters = ( "''mac_file_spec'", -
                                "''destination'", -
                                "''options'") -
                /AFTER="''p4'" -
                /noprint -
                /notify
$ copy 'options 'mac_file_spec 'destination
$!
$!      Done
$!
$ temp = f$verify(save_proc_verify, save_image_verify)
```

Other examples of backing up

With DECnet for Macintosh, you can devise various backup plans that meet your needs. You may find that you need to back up only files within a specific folder (in which case you would modify the [...] specifier), or that you do not need multiple versions of files maintained on the VAX computer each time you perform the backup.

If you do not need to maintain multiple versions of files on the VAX computer, use the /REPLACE qualifier to write over existing copies.

You should be aware of a few potential limitations of this backup scheme:

- There is no way of knowing that a file has been deleted. Therefore, when you do an incremental copy, you will never automatically delete a file that was previously backed up on your VAX computer.
- Renaming folders will not automatically flag as changed all of the files contained within the folders. Backed up files will be restored using the folder name that was in place at the time of the backup.

- You must also maintain your own scheme of determining the date of the last incremental backup (the last date that you apply the /SINCE qualifier).
- You must maintain a copy of the Network Data file in the System Folder. For security reasons, this file is never copied.
- You must restore files to a disk with the same name if you initiate the restore operation from a VMS system. If you restore the files to a disk with any other name, the restore operation produces a series of "Failure to Rename" error messages. DECnet for Macintosh provides this message to prevent restoring data to the wrong disk. You can use the NetCopy application to restore these files anywhere you want.

7 Using Asynchronous DECnet Communication

This chapter describes how to configure your Macintosh computer as a DECnet node to make an asynchronous connection. Asynchronous communication is a method of data transmission that lets you run DECnet from a serial port.

Two types of asynchronous connections are available:

- A static connection, which allows the remote Macintosh user to dial directly over a modem from the DECnet for Macintosh Control Panel.
- A dynamic connection, which allows the remote Macintosh to connect through a three-step sequence using MacTerminal.

Configuring your node for asynchronous DECnet

To configure your Macintosh for asynchronous DECnet for the first time, you need to perform the following tasks:

- Obtain the necessary network information from your system administrator.
- Start NCP.
- Enter your network address in the dialog box.
- Set the name of your node in the Executor Characteristics dialog box.
- Set the default startup state to OFF in the Executor Characteristics dialog box.
- Set the user name, password, and DDCMP password in the Security Settings dialog box.
- Set the buffers in the Executor Characteristics dialog box.
- Set the line speed to match the speed of your modem.
- Quit NCP and restart your Macintosh computer.
- Start NCP again and verify that the DECnet state is set to OFF.
- Define another node and connect to it.

Before you configure, obtain the DECnet name, address, modem speed, and transmit password of your DECnet node from your system administrator.

The sample asynchronous DECnet configuration uses the following values:

- node name: RMTMAC
- node address: 26.236
- modem: 9600-baud Hayes-compatible

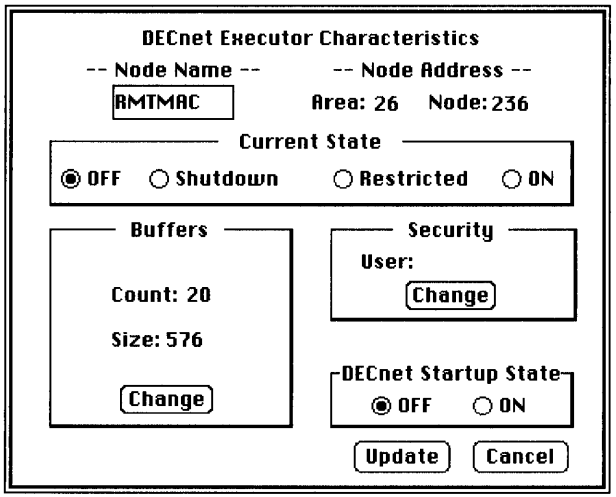
To configure for asynchronous DECnet:

1 **Double-click the NCP icon.**

The View/Update Parameters dialog box is displayed.

2 **Click the Exec Settings button.**

The DECnet Executor Characteristics dialog box is displayed.



3 **Verify that the node name and address displayed match the node name and address assigned for your remote use.**

If you need to change these settings, follow the instructions in the sections "Entering Your Node Name" and "Verifying Your Node Address" in Chapter 2.

4 **Click the DECnet Startup State OFF button.**

5 **Click the Change button in the Security box.**

In the DDCMP Transmit Password field, enter the password that you obtained from your system administrator, and click the Update button.

The settings are recorded, and the DECnet Executor Characteristics dialog box is displayed.

6 **Click the Update button.**

The View/Update Parameters window is displayed.

7 **Click the Line Settings button.**

The DECnet Line Settings dialog box is displayed. DECnet software for Macintosh is preset for 9600 baud.

Change the line speed to match the speed of the modem you are using, and click the Update button.

The View/Update Parameters dialog box is displayed.

8 **Click the Quit button.**

9 **Restart your system.**

When your Macintosh restarts, it is ready to make a DECnet connection.

Connecting to the DECnet network

This section describes two ways to make a serial connection:

- from the DECnet for Macintosh Control Panel
- from MacTerminal

Your system administrator can recommend the kind of connection that is used for your remote Macintosh configuration.

Connecting from the DECnet Control Panel

You can connect from the DECnet Control Panel if you use a static DECnet connection with modems.

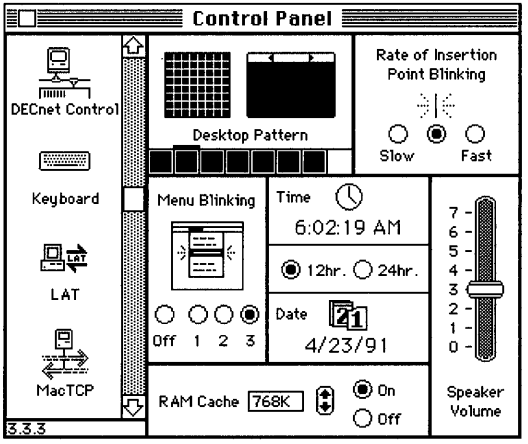
Before you connect, obtain the telephone number and modem speed of a line that provides asynchronous DECnet service at your site from your system administrator.

To connect from the DECnet Control Panel:

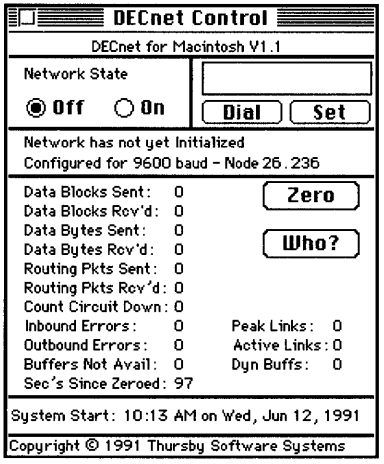
1 **Open the Control Panel.**

- Version 6.0.*x*

  a. Choose Control Panel from the Apple (🍎) menu.
  The Control Panel window is displayed.

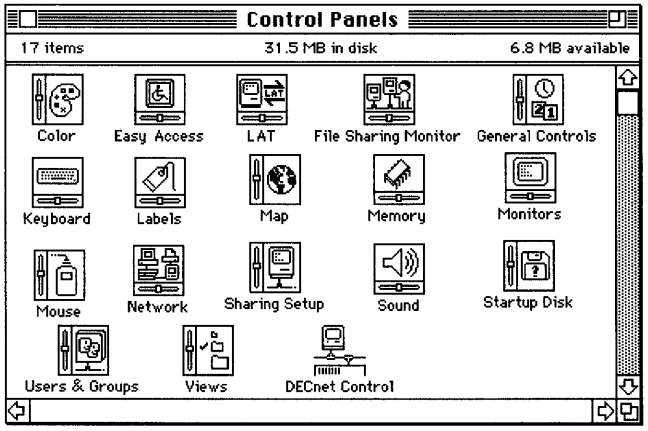


  b. Double-click the DECnet Control icon from the group of icons on the left side of the Control Panel window.
  The DECnet Control Panel is displayed.

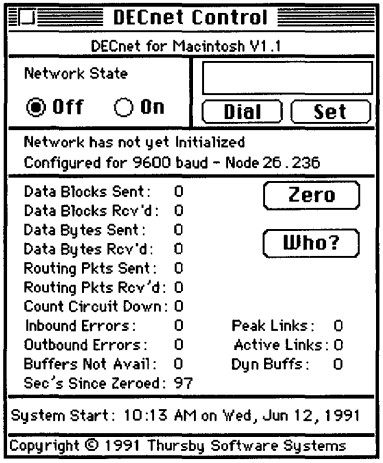


- Version 7.0

  a. Choose Control Panels from the Apple (🍎) menu.
  The Control Panels window opens. Each control panel has its own icon and can be opened like a program or a document.



b. Double-click the DECnet Control icon.
You may have to scroll through the window to find the DECnet Control icon. The DECnet Control Panel is displayed

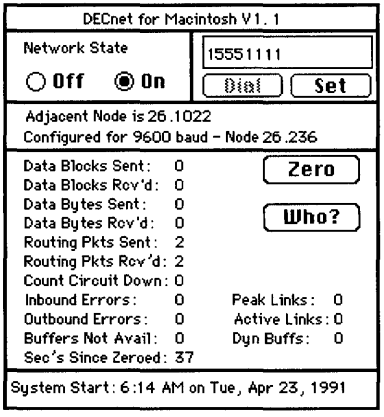


2 **Enter the telephone number in the box in the upper-right corner of the Control Panel and click the Dial button or press Return.**

A message is displayed after the dialing sequence is complete.

You can continue to monitor the state of the DECnet circuit from the DECnet Control Panel.

3 **Click the Zero button.**



If the Adjacent Node address is not displayed within 60 seconds, see "Checking an Asynchronous Connection" in the appendix.

If the Adjacent Node address is displayed, DECnet is active. After a successful connection, you can start Mail for Macintosh, a MacTerminal CTERM connection, or any other program that uses the DECnet connection tool. Figure 7-1 shows a Mail for Macintosh connection that uses a 9600 baud asynchronous DECnet line.

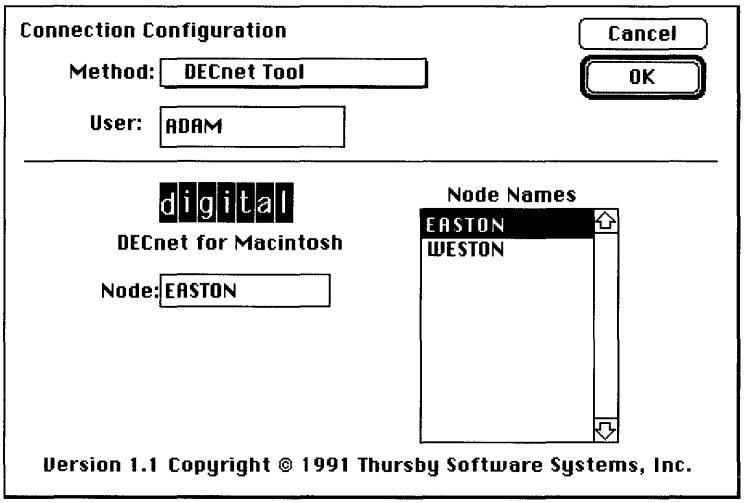


Figure 7-1 Asynchronous DECnet with Mail for Macintosh

Connecting from MacTerminal

You can connect from MacTerminal 3.0 if your Macintosh uses a dynamic DECnet connection.

The dynamic connection is a three-part process:

- setting up MacTerminal
- making the connection from MacTerminal
- starting DECnet in the DECnet Control Panel

Setting up MacTerminal

To use the MacTerminal program, configure a serial connection document as shown in Table 7-1.

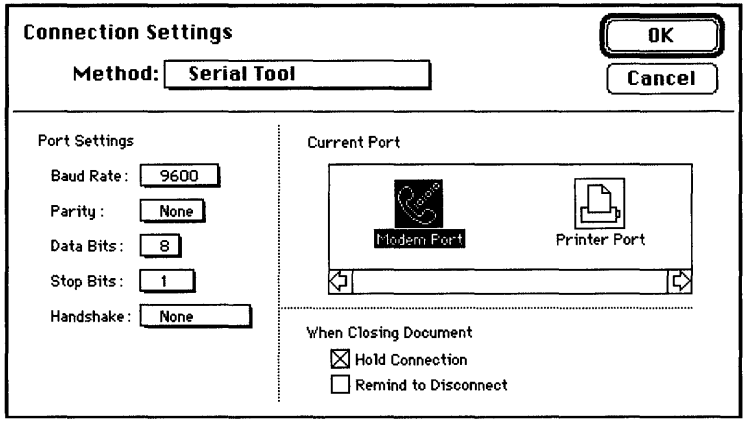
To configure a serial connection document:

1 **Double-click the MacTerminal icon.**

A new terminal document is displayed.

2 **Choose the Connection command from the Settings menu.**

The Connection Settings dialog box is displayed.



3 **Choose the Serial Tool from the Method pop-up menu.**

4 **Click the Modem Port icon.**

5 **Make sure that the settings in each Port Settings pop-up menu match the ones in Table 7-1.**

If the settings do not match, the connection will not work correctly.

Table 7-1 Serial Tool settings for asynchronous DECnet

Parameter	Setting	Related tasks
Connection Method	Serial	Click the Hold Connection checkbox.
Baud rate	Preset to 9600	Use the baud rate of the modem at your site.
Parity	None	Use the default connection setting.
Data bits	8	Use the default connection setting.
Stop bits	1	Use the default connection setting.
Parity	None	Use the default connection setting.

6 **Click the Hold Connection checkbox.**

This setting allows you to exit from MacTerminal after the DECnet line is set up.

7 **Click the OK button.**

The new terminal document is displayed.

8 **Choose Connect on Open from the Settings menu.**

9 **Choose Save As from the File menu, name the document, and click the Save button.**

This saves the settings for future use.

Making the connection

Before you can make a dynamic asynchronous connection from MacTerminal, you must obtain from your system administrator the telephone number and modem speed of a line that provides asynchronous DECnet service at your site.

To make the connection:

1 **Choose Open Connection from the Session menu.**

2 **Enter AT and press Return.**

MacTerminal displays "OK."

3 **Enter the AT command to dial the number, and press Return.**

For example:

```
ATS7=60DT15551111<Return>
```

Table 7-2 shows the format of the AT commands.

Table 7-2 AT commands

Parameter	Description
AT	Gets the attention of the modem.
S7=60	Stores a delay of 60 seconds in the S7 register of the modem. This value can vary.
DT	Tells the modem to dial the number that follows using tone dialing.
15551111	Tells the modem to dial a one-digit access prefix followed by a seven-digit phone number

If result codes are enabled, a connection message, "CONNECT 9600," is displayed.

4 **After a successful connection, log on to the VAX computer.**

5 **Enter the command to change the telephone line into a DECnet line.**

```
$ SET TERMINAL/PROTOCOL=DDCMP/SWITCH=DECNET/MANUAL/DISCONNECT
```

If the setup command is successful, the following message is displayed.

```
%SET-SWINPRG-The line you are currently logged over is
becoming a DECnet line
```

6 **Click the Close box to quit the serial session.**

If you clicked the Hold Connection checkbox in the Connection Settings window, the modem lights indicate that MacTerminal is holding the connection.

Starting DECnet

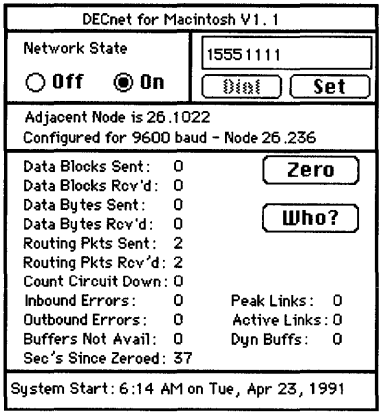
After exiting from the MacTerminal session, while holding your DECnet connection, start DECnet from the Control Panel window.

To start DECnet:

1 **Open the Control Panel from the Apple (🍎) menu.**

2 **Double-click the DECnet icon.**

The DECnet Control Panel is displayed.



You can monitor the state of the DECnet circuit from the DECnet Control window.

3 **Click the Network State ON button.**

4 **Click the Zero button.**

If the Adjacent Node address is not displayed within 60 seconds, see the section "Checking an Asynchronous Connection" in the appendix.

If the Adjacent Node address is displayed, DECnet is active.

Shutting down

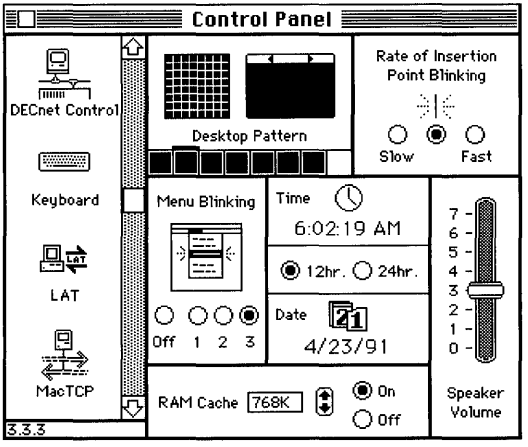
When you have finished using DECnet for Macintosh, shut down the serial line, and make sure that the line again becomes available for telephone service.

To stop DECnet and shut down the serial line:

1 Open the Control Panel.

- Version 6.0.*x*

  a. Choose Control Panel from the Apple (🍎) menu.
  The Control Panel window is displayed.



  b. Double-click the DECnet control icon from the group of icons on the left side of the Control Panel window.
  The DECnet Control Panel is displayed.

- Version 7.0

  a. Choose Control Panels from the Apple (🍎) menu.
  The Control Panels window opens. Each control panel has its own icon and can be opened like a program or a document.

  b. Double-click the DECnet Control icon.
  The DECnet Control panel is displayed

2 **Click the Network State OFF button.**

3 **If MacTerminal is active, enter the ATH command to hang up the modem:**

The modem displays "OK."

4 **Click the Close box to quit the serial session.**

5 **Turn off the modem.**

Appendix: Troubleshooting a DECnet Connection

This Appendix describes how to test and troubleshoot the operation of DECnet for Macintosh software.

Because operating this product involves the Macintosh and other computer systems, you should be familiar with both DECnet and the other networking environments that are part of your configuration, such as AppleTalk for VMS. Therefore, a system administrator who knows the details of your particular configuration can help you perform these troubleshooting techniques.

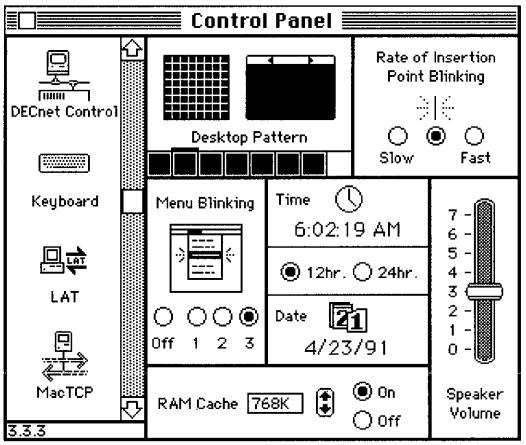
If for some reason you find that DECnet for Macintosh is not functioning properly, follow these steps:

- Make sure DECnet software is running.
- Check your network configuration.
- Verify that DECnet is active.
- Verify your node definitions.
- Check all hardware connections.
- Check the asynchronous software.

Making sure DECnet software is running

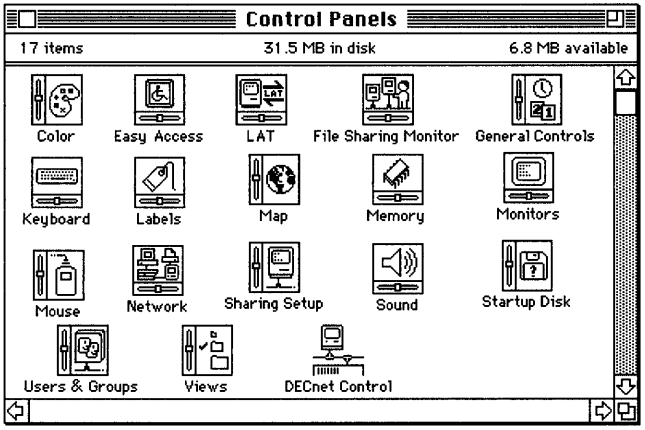
To make sure DECnet software is running:

- **Open the Control Panel.**
  - Version 6.0.*x*
    a. Choose Control Panel from the Apple (🍎) menu.
    The Control Panel is displayed.

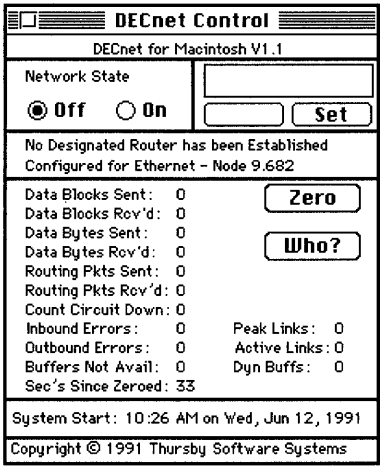


    b. Double-click the DECnet Control icon from the group of icons on the left side of the Control Panel window.
    The DECnet Control Panel is displayed.

  - Version 7.0
    a. Choose Control Panels from the Apple (🍎) menu.
    The Control Panels window is displayed. Each control panel has its own icon and can be opened like a program or a document.



b. Double-click the DECnet Control icon.
The DECnet Control Panel is displayed



If the network state is off, click the ON button.

If the network state is on, but DECnet has not started, go on to the next section, "Checking Your Network Configuration."

Checking your network configuration

If you cannot start DECnet after completing the previous section, you can check your network configuration from the DECnet Control Panel. You do this by checking your router information (in the DECnet Control Panel) against the configuration questions in Table A-1.

Table A-1 Configuration questions

Configuration	Is the router node name:	Is the Macintosh node:
Ethernet	A router in the Macintosh node's DECnet area?	Configured for Ethernet? Set to the correct DECnet address?
AppleTalk	The node name or area node of the AppleTalk router gateway?	Set to the correct DECnet address?
Asynchronous	A node name to which an asynchronous line is connected?	Set for the correct line speed? DECnet address?

If any of the information about your Macintosh node type and address is incorrect, you must check your configuration.

To check your network configuration:

1 **Start NCP.**

2 **Reconfigure your Macintosh.**

The steps are described in the section "Configuring Your Macintosh for Ethernet or AppleTalk" in Chapter 2 and "Configuring Your Node for Asynchronous DECnet" in Chapter 7.

If the configuration is correct and you still cannot start DECnet, go on to the next section, "Verifying That DECnet Is Active."

Verifying that DECnet is active

To verify that DECnet is active:

1 **Open the Control Panel from the Apple (🍎) menu.**

2 **Double-click the DECnet Control icon.**

You can monitor the state of the DECnet circuit from the DECnet Control Panel.

3 **Click the Network State ON button.**

Look at the Seconds Since Zeroed field. When the counters are first reset to zero, it is easier for you to see the numbers increase.

4 **Click the Zero button**

Look at the Routing Packets Received and Routing Packets Sent counters for 30 seconds.

- If your Macintosh is sending and receiving routing packets, quit the Control Panel and re-attempt the operation that did not previously work.
- In some cases, it is normal for only the Routing Packets Sent counter number to increase (for example, when your network does not include a DECnet router). If the Routing Packets Sent counter does not increase, go on to the next section, "Verifying Node Definitions."

Verifying node definitions

DECnet for Macintosh includes a simple loopback test that checks whether you have added a node correctly.

To run the loopback test:

1 **Double-click the NCP icon.**

The View/Update Parameters dialog box is displayed.

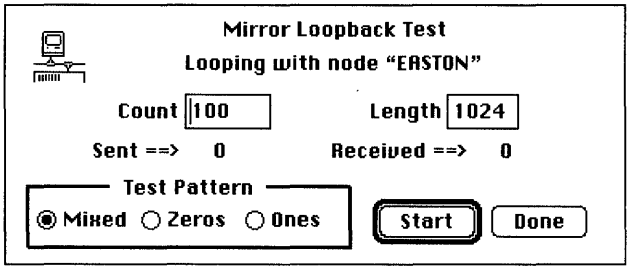
2 **Click the Node Definitions button.**

The Node Names Management window is displayed.

3 **Click the name of your node to select it.**

4 **Click the Loop button.**

The Mirror Loopback Test dialog box is displayed.



5 **Click the Start button.**

If the test is successful, the numbers in the Sent and Received fields should match the number in the Count field.

Otherwise, you receive an error message in a dialog box. If you receive an error message such as "Remote node not found," or "Remote request terminated," you have incorrectly entered your node name or address. In this case, follow these steps:

a. Click the Done button to return to the Node Name Management dialog box.

b. Click the Delete button.
   The node that failed the loopback test is deleted from the node list.

c. Reenter the node definition information for the node (area number, node address, node name, user name, and password).

d. Repeat the loopback test.

6 **Quit NCP.**

Checking hardware connections

If you cannot make a DECnet connection after completing the previous sections, you can check the network hardware connections.

To verify the network hardware connections:

1 **Check that the cabling is properly installed.**

2 **If you are using an Ethernet connection, check that the Ethernet card and the correct software from the Ethernet card's manufacturer are properly installed.**

Refer to the documentation that comes with the card and the software.

3 **If you are using a LocalTalk connection:**

a. Check that the router has the appropriate DECnet software installed on it. The name of the router is displayed in the Network Control window.

b. Find out what zone your router is in, and make sure that your Macintosh node is in the same zone as the router. Use the network management utility provided with your multi-protocol router to verify the zone numbers.

4 **If you find a problem in your network connections, correct it as described by the hardware manufacturer and try the operation again.**

5 **If you do not find a problem in your network hardware, verify that your Macintosh can communicate with the desired remote node as described in the preceding section.**

Checking an asynchronous connection

If the asynchronous line does not come up within 60 seconds, there may be a problem with the connection. Review the following list and try again.

1 **Make sure that the line is properly configured as described in the section "Configuring Your Node for Asynchronous DECnet" in Chapter 7.**

2 **Verify that the Receive password is defined on the VAX.**

This error most likely shows up while the Starting message is displayed and while the line state is set to ON.

To verify the password, ask your system administrator to enter a command in the following form from a privileged account:

```
$ MCR NCP SHOW NODE WESTON CHARACTERISTICS

Node Volatile Characteristics as of 5-APR-1991 14:39:47

Remote node = 9.682 (WESTON)

Receive password = ACANAL

Transmit password = AMAN
```

3 **Verify that the transmit password defined on the VAX matches the password defined in the DDCMP Transmit Password field of the DECnet Security Settings dialog box on your Macintosh.**

4 **Check the modem connection if necessary.**

a. Make sure that the modem is properly cabled.

b. Make sure that the line speed of the modem matches the line speed of the modem at the remote system.

c. Check that MacTerminal is configured for a Serial Tool, not a Modem Tool.

d. Verify that the Hold Connection checkbox in the Connection Settings dialog box is checked. Then make sure that MacTerminal holds the connection to the telephone line when you exit from the program.

5 **Make sure that the line speed setting for DECnet for Macintosh (set through NCP on the Macintosh) is the same as the line speed setting for the terminal emulator.**

6 **Ask your system administrator to make sure that the address of your Macintosh node is not greater than the Exec maximum address.**

7 **Check with your system administrator about any DECnet errors reported on the VMS system.**

8 **Follow up on any DECnet errors with your system administrator.**

If none of the preceding steps work, the problem is likely to be isolated on the remote system. In that case, ask the system administrator of the remote system to verify the configuration questions in Table A-2.

Table A-2 Asynchronous configuration questions for the client administrator

Remote component	Question	Comment
For a static asynchronous connection:		
DECrouter	Is the router correctly configured?	See the *DECrouter Installation Guide*
For a dynamic asynchronous connection		
Terminal Line	Is the terminal line on the remote system correctly configured for dynamic asynchronous DECnet?	See the *Guide to Using DECnet-VAX* for more information.
DYNSWITCH	Is the DYNSWITCH software installed as a shared image?	See the *Guide to Using DECnet-VAX* for information.
For either a static or dynamic connection:		
Modem	Is the modem correctly connected to the port of the router?	See the documentation supplied with your modem.
	Does the speed of the remote modem match that of the local modem?	

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Glossary

access privileges Settings that determine whether a user may see folders on a file server, and whether the user may open and make changes to files within a folder. The person who creates a folder sets the access privileges for that folder.

adjacent node The node at the other end of the line in point-to-point asynchronous connections. All DECnet nodes are adjacent nodes or routing nodes in Ethernet or LocalTalk connections.

ADSP See **AppleTalk Data Stream Protocol.**

ADSP driver A system file that provides the AppleTalk Data Stream Protocol on your Macintosh.

alternate log-on method See **VMS UAM.**

AppleShare Software that runs on Macintosh computers to provide file and print services on an AppleTalk network. See **AppleShare file server, AppleShare print server.**

AppleShare client The combination of your Macintosh computer and the AppleShare workstation software, which allows you to access an AppleShare or VAXshare file server. See also **AppleShare file server, AppleShare workstation software.**

AppleShare file server On an AppleTalk network system, a combination of software, one or more hard disks, and a Macintosh computer that stores documents, folders, and application programs. If you have the AppleShare workstation software installed on your computer, you can access the stored files and can also store your own files on the server and share them with other users. See also **AppleShare client, AppleShare workstation software.** Compare **VAXshare file server.**

AppleShare print server On an AppleTalk network system, a combination of software and a Macintosh computer that captures documents sent to it and manages the printing of those documents on network printers. If you have the AppleShare workstation software installed on your computer, you can submit a job to the print server and then use your Macintosh for other tasks while the print server controls the printing of your files. Compare **VAXshare print server.**

AppleShare workstation software A set of resources that acts as an extension of the system software. These resources provide information that your computer needs to let you access AppleShare or VAXshare file servers. You install the resources as a part of the System file in your System Folder on your Macintosh. See also **AppleShare client, resource.**

Apple Standard UAM The preset (default) log-on method for VAXshare file servers. When you use the Apple Standard UAM, your password is limited to eight characters. The Apple Standard UAM lets you select server volumes that appear automatically on your

desktop when you start your computer. If you specify startup volumes, you don't have to log on to the file server and mount the volumes each time you want to use VAXshare. See also **log-on method, VMS UAM.**

AppleTalk Data Stream Protocol (ADSP) An AppleTalk communications protocol that lets you establish connections between application programs on a network. ADSP allows full-duplex, byte-stream connections. Data flow on an ADSP connection is reliable; ADSP guarantees that data bytes are delivered in the same order as they were sent and that they are free of duplicates.

AppleTalk-DECnet Connection Tool A connection tool that allows your Macintosh computer to communicate with VAX computers through the AppleTalk/DECnet Transport Gateway. See also **AppleTalk/DECnet Transport Gateway, connection tools.**

AppleTalk/DECnet Transport Gateway A device that translates between AppleTalk and DECnet communications protocols on a network. Depending on the complexity of the network to which your Macintosh is connected, you may have access to more than one gateway. See also **AppleTalk network system, DECnet, gateway.**

AppleTalk-LAT Connection Tool A connection tool that provides LAT connections for Macintosh computers on any AppleTalk network including LocalTalk local area networks. The AppleTalk-LAT Tool uses the services of the AppleTalk-LAT Gateway to provide transport between the AppleTalk and LAT protocols. See also **AppleTalk-LAT Gateway, connection tools.**

AppleTalk-LAT Gateway A device that translates between AppleTalk and LAT protocols on a network. See also **AppleTalk network system, gateway.**

AppleTalk network system A networking environment that includes computers and other devices, software programs, and AppleTalk protocols that govern the interactions between the components. The specification for the AppleTalk network system was created by Apple Computer, and Macintosh computers and LaserWriter printers have AppleTalk capabilities built in. Other Apple and non-Apple devices may also be able to use AppleTalk. For example, AppleTalk for VMS allows services and devices on VAX computers running the VMS operating system to communicate by means of AppleTalk protocols. See also **AppleTalk Phase 1, AppleTalk Phase 2, AppleTalk protocols.**

AppleTalk Phase 1 Components of the AppleTalk network system that predate the development of AppleTalk Phase 2. A network may run both AppleTalk Phase 1 and AppleTalk Phase 2 at the same time. On such a network, a computer that has AppleTalk Phase 1 installed will be able to see only those network devices that use Phase 1—not those that use Phase 2. See also **AppleTalk network system, AppleTalk Phase 2.**

AppleTalk Phase 2 A new version of AppleTalk software that provides extensions to the AppleTalk network system, allowing it to support larger and more flexible networks. If your network uses both AppleTalk Phase 1 and AppleTalk Phase 2, and you have AppleTalk Phase 2 installed on your Macintosh, you will be able to see other network devices that use AppleTalk Phase 2 as well as those that use Phase 1. See also **AppleTalk network system, AppleTalk Phase 1.**

AppleTalk protocols The set of communication rules used in the AppleTalk network system. See also **communications protocol.**

asynchronous connection A connection method in which the receiving and sending devices don't share a common timer, resulting in characters transmitted at irregular intervals. Commonly used between two DECnet nodes over a serial line.

backbone In an Ethernet environment, the thick central cable to which the nodes of a network are connected. You can connect backbones together with routers to create larger networks.

backup The operation of duplicating files or volumes of files to protect data from loss or corruption. See also **restore.**

binary files A file whose data is to be interpreted in binary form. Machine-language programs and pictures and other data are stored in binary files.

bridge A device used to extend a network by connecting that network to other networks that use the same communications protocols. The original component networks of a bridged network cannot be addressed as separate entities but become a single, larger network. A bridge helps reduce network traffic, however, because data traveling between devices on the same side of the bridge stays on that side, rather than traveling over the entire network. Compare **gateway, repeater, router.**

buffer size The size of the area of memory set aside for the specific purpose of holding data until it is needed. It is sometimes necessary to increase the buffer size of your DECnet for Macintosh node to send or receive very large records.

client (1) On a network, a combination of a computer and software that lets you access services offered by a server, such as printing (print server), shared files (file server), and so on. The computer that you use to access the services—usually your workstation—is sometimes referred to as the client, but there is always a client software component. In most cases, the client software is located on your workstation and the server resides on a remote computer. (2) In an X environment, an application program that runs, in most cases, on a remote host computer, although it may run on your workstation. You access the client by means of an X server located on your workstation. Thus the server-client orientation is reversed from the arrangement described in (1). See also **AppleShare client, DECwindows application program, server, X Window System.**

communications protocol A set of rules that determine how information is transmitted and received by communicating devices. The communications protocols built into networking software perform such tasks as acquiring commands from the program you are using, making sure devices are responding properly, controlling the connection to the network, and moving data between devices. See also **AppleTalk protocols, DECnet,** and **LAT.**

Communications Toolbox See **Macintosh Communications Toolbox.**

communications tools Pieces of software that supply the communications functions that your Macintosh needs to communicate with another computer. Communications tools fall into three categories connection tools, file-transfer tools, and terminal emulation tools. Each type of tool manages a different aspect of the communication process. See also **connection tools, file-transfer tools, terminal emulation tools.**

connection tools One of the three types of communications tools. A connection tool determines the type of connection that is established between your Macintosh and the VAX computer or Digital network. Examples: Apple Modem Tool, LAT Tool, Serial Tool. See also **communications tools.**

creator code A 4-character code assigned to a file that signifies the program that created the file.

CTERM Connection Tool A connection tool that provides task-to-task communications for terminals connected to DECnet wide area networks. See also **connection tools, DECnet.**

data fork The part of a Macintosh file that contains data. Macintosh files are composed of two forks: the data fork and the resource fork. See also **resource fork.**

DCL See **Digital Command Language.**

DECnet The set of network communications protocols most often used on Digital networks, and used on other kinds of systems as well. DECnet offers a flexible protocol architecture that works with a number of different network media and lower-level protocols. See also **communications protocol.**

DECnet area A grouping of nodes that enable you to create large networks. The area number is the part of the DECnet address to the left of the decimal point. (For example, **62**.689 signifies area 62.)

DECnet link Communication path between two DECnet nodes.

DECnet node name A name that contains six or fewer letters and numbers that uniquely identify your DECnet node. Node names are assigned by the network administrator.

DECnet node number A number assigned by the network administrator that uniquely identifies your DECnet node. The node number is the part of the DECnet address to the right of the decimal point. (For example, 62.**689** signifies node number 689.)

DECnet routing node The computer that selects the correct path between nodes, areas, or networks. See also **router.**

DECterm A DECwindows terminal emulation application program. DECterm allows your Macintosh to emulate a VT320 terminal so that you can log in to the VMS operating system from the DECwindows environment and issue Digital Command Language commands. In PATHWORKS for Macintosh, you use MacX to access DECterm. See also **DECwindows application program, Digital Command Language, MacX.**

DECwindows A version of the X Window System created by Digital Equipment Corporation to run on VAX computers. DECwindows runs under both the VMS and the ULTRIX operating systems. You use the MacX server on your Macintosh computer to access DECwindows programs running on VAX computers. See also **MacX, X Window System.**

DECwindows application program An X client running on a VAX or ULTRIX computer under DECwindows—Digital's implementation of the X Window System. In PATHWORKS for Macintosh, you access DECwindows programs by using the MacX server on your Macintosh computer. See also **MacX, ULTRIX, X Window client, X Window System.**

device queue A print queue for a specific printer or a specific paper tray of a printer. See also **generic queue, print queue.**

Digital Command Language (DCL) The standard command interface to Digital's VMS operating system. When you log in to VMS, you use DCL commands to perform operations such as changing your password or displaying a directory of files on the VAX computer.

directory A list of files on a storage device. Directories usually contain a hierarchical set of subdirectories. In the DECnet for Macintosh NetCopy program, a VMS directory is displayed with a folder icon to the left of the directory name and is equivalent to a Macintosh folder.

Ethernet A high-speed local area network system that uses a variety of cables, such as thick-wire, thin-wire, broadband, twisted-pair, and so on. The Ethernet specification was developed by Digital Equipment Corporation, Intel Corporation, and Xerox Corporation.

Ethernet card A printed circuit board or interface card that connects a personal computer, such as a Macintosh, to Ethernet and serves as the communications controller between the computer and other devices in the Ethernet environment. A number of Ethernet cards are available for Digital, Apple, and other types of computers. Apple provides an Ethernet card called the *EtherTalk NB Card.* See also **Ethernet, EtherTalk.**

EtherTalk A high-performance AppleTalk connection. EtherTalk consists of an Ethernet interface card, AppleTalk software, and Ethernet cables. EtherTalk allows you to use Ethernet cables in an AppleTalk environment. See also **AppleTalk network system, communications protocol, Ethernet.**

EtherTalk NB Card An Ethernet card provided by Apple Computer, Inc. See also **Ethernet, Ethernet card, EtherTalk.**

executor The node at which a DECnet Network Control Program (NCP) command actually executes.

File Access Listener (FAL) A program that resides on a DECnet host and acts as the target for requests made by the Network File Transfer (NFT) programs residing on remote DECnet hosts. The FAL program is responsible for determining a user's access privileges to a requested file and for either honoring or rejecting the request.

file server (1) A specially equipped computer that allows network users to store and share information. (2) A combination of controller software and a mass-storage device that allows computer users to share common files and programs through a network. AppleShare software, Macintosh computers, and one or more hard disks make up a file server on an AppleTalk network system. See **AppleShare file server, VAXshare file server.**

file-transfer tools One of the three types of communications software tools. A file-transfer tool ensures that files are transferred intact between your Macintosh and the VAX computer or Digital network. Examples: Text Tool, XMODEM Tool. See also **communications tools.**

FileView A DECwindows application program that creates a graphical representation of the VMS operating system. FileView lets you see the files and directories on a VAX computer. The DECwindows Session Manager is preset to start FileView automatically. See also **DECwindows, Session Manager.**

gateway A device that translates between two communications protocols on a network. A gateway allows network services that use different protocols to communicate with each other. See also **AppleTalk-LAT Gateway, AppleTalk/DECnet Transport Gateway.** Compare **bridge, repeater, router.**

generic queue A print queue of jobs to be printed on one or more printing devices, each of which prints a different type of job. The print server may use generic queues in conjunction with device queues. See also **device queue, print queue.**

graphics-based application An application program whose user interface is composed of graphic elements, such as windows, menus, and buttons, as opposed to alphanumeric characters. Graphics-based programs require display devices with controlling hardware and software that enable the display of graphic elements.

image files Binary files that are stored on your Macintosh computer. DECnet transfers files byte-for-byte without translation or modification of the file.

installation The process of adding or changing information on a Macintosh computer. For example, the Installer program provided with PATHWORKS for Macintosh installs software and updates the System file. The Installer uses Installer script documents that define the software to be installed.

internet In the context of AppleTalk, a network made up of two or more interconnected local area or wide area networks. The networks are joined by a router. See also **router.**

internet router See **router.**

LAN See **local area network.**

LAT Connection Tool A communications tool that lets you access LAT services on Digital computers. See also **connection tools, Local Area Transport Protocol.**

LAT protocol See **Local Area Transport Protocol.**

link See **DECnet link**.

local area network (LAN) A group of computers and shared devices connected to the same transmission cables and located within a limited area, usually a single building. Contrast **wide area network.**

Local Area Transport (LAT) Protocol A communications protocol developed by Digital to support high-speed terminal services. See also **communications protocol.**

LocalTalk A system of cables, cable extenders, and connector boxes that connect Apple computers and network devices.

logging Recording information about an event. The NetCopy Error Window maintains such a log about network connections and file transfers.

log in In the context of PATHWORKS for Macintosh, to open a connection to the VMS operating system. You log in to VMS with MacTerminal or, from MacX, by using DECterm.

log-in directory A directory created for you by the system administrator when your user name and password are assigned. It is the first directory that you see when you log in to VMS.

log on In the context of PATHWORKS for Macintosh, to access a file server or print server.

log-on method The procedure for logging on to a VAXshare file server. Also referred to as user authentication method (UAM). The Apple Standard UAM is built into the AppleShare workstation software. However, you can also install the VMS UAM. The primary differences between the two methods are the length of the password that you can use (8 characters for Apple Standard, 31 for VMS Password) and whether you can have server volumes appear on your desktop automatically when you start up. See also **Apple Standard UAM, VMS UAM.**

MacBinary A special format that allows Macintosh files to be stored on non-Macintosh hard disks and to be transmitted to and from non-Macintosh computers.

Macintosh Communications Toolbox A set of extensions to the Macintosh system software that provides Macintosh application programs with standard communications services and a consistent interface for using those services. For example, MacTerminal uses the Communications Toolbox to let you connect to terminal services.

MacTerminal A communications application program, supplied with PATHWORKS for Macintosh, that allows your Macintosh computer to emulate a terminal and communicate with VAX (and other) computers.

MacX An application program supplied with PATHWORKS for Macintosh. MacX is Apple Computer's implementation of the X Window System for the Macintosh, providing an X server that takes advantage of the Macintosh user interface. MacX allows you to access DECwindows programs running on VAX computers. See also **DECwindows application program, X Window server, X Window System.**

network A collection of interconnected, individually controlled computers, the hardware and software used to connect them, and the communications protocols that govern the exchange of information between the computers and other devices. A network allows users to share data and peripheral devices such as printers and storage media, to exchange electronic mail, and so on.

node A network device that can be addressed as an individual entity. A VAX or Macintosh II computer with multiple network connections can act as more than one node. For example, if your Macintosh has two Ethernet cards installed, each card is a separate node on the network.

operating system Software that controls the basic operations of a computer.

packet A unit of data to be transmitted from a source node to a destination node.

permanent database The file containing network information that is retained across system shutdowns. In DECnet for Macintosh, this file is called Network Data and is found in your System Folder.

PostScript A programming language that defines how the computer will draw the shapes that make up letters and graphics on an output display device, such as a screen or printer, that supports PostScript. PostScript code is generally used transparently in programs—that is, to use the program you won't need to know anything about PostScript, nor will you see it working. However, if you learn PostScript, you will be able to embed the codes in programs that support the language.

print queue A list of files captured by a print server and waiting to be sent to the printer. Print servers and print spoolers use queues to manage printing tasks. See also **device queue, generic queue, print spooler.**

print server A combination of software and hardware that captures documents sent to it by network users and that manages the printing of those documents on a network printer. See also **AppleShare print server, VAXshare print server.**

print spooler Part of the print server software. The spooler manages printing jobs for a particular printer—it sends jobs waiting in the print queue to the printer one by one, as the printer is ready for them. See also **print queue.**

protocol See **communications protocol.**

proxy access An option that equates one or more users on a remote node to users on your local node. With proxy access enabled, a DECnet user on a remote node can access any data that resides on the local node.

queue A list or sequence of jobs, such as printing a document, that users request the system to perform. Usually, the system completes each job in the order in which it was requested.

remote computer A computer other than your own but in communication with yours through communication links. A remote computer can be any distance from your computer, from beside it to thousands of miles away.

repeater A device used to expand a network. When a network needs to cover a greater distance or include a larger number of devices than the maximum specified for its cables, a repeater can be added to extend those limits. As a signal travels through a network cable, it becomes weakened; when a repeater receives the signal, it amplifies the signal and retransmits it. The signal can travel on without losing its integrity. The repeater extends the distance that can be covered by a network cable and thus increases the physical limit to the number of devices that can be connected. Compare **bridge, gateway, router.**

resource A software module containing data used by the Macintosh Operating System or by Macintosh application programs. Resources are stored in the resource fork of a Macintosh file. For example, a resource might provide a menu, font, or icon for a program.

resource fork The part of a Macintosh file that contains the resources used by an application program, such as menus, fonts, and icons. An executable file's code is also stored in the resource fork. Macintosh files are composed of two forks: the resource fork and the data fork. See also **data fork.**

restore An operation that returns files to their original state after they have been copied by a backup utility. DECnet for Macintosh includes the full Macintosh file-name and the folder path within the file so that the file can be restored to its original location. See also **backup.**

root The top of the hierarchy of a storage device's directory. Files located at the root level of a Macintosh volume are not contained in any folder. Thus, the icons for these files appear in the volume's window; you do not have to open any folders to find them.

rooted In MacX, a style of operation in which DECwindows program windows are displayed in the root window. See also **MacX, rootless, root window.**

rootless In MacX, a style of operation in which DECwindows program windows are displayed in Macintosh-style windows, independent of the root window. See also **MacX, rooted, root window.**

root window The window at the first level of the window hierarchy in a traditional X environment. All other windows are subordinate to the root window. See also **MacX, rooted, rootless.**

router A device used to link networks that use the same communications protocols—but possibly different connection media. For example, a router can link and allow data to cross between two AppleTalk networks, such as a LocalTalk network and an EtherTalk network. In Apple terminology, when networks are joined by a router, the result is an *internet*. The original component networks of an internet can be addressed as separate entities. When data is transmitted over the internet, the

router directs the data to its destination by the most efficient route. Compare **bridge, gateway, repeater.** See also **internet.**

server (1) On a network, a combination of hardware and software that provides a particular service such as access to shared files (file server), printing (print server), and so on. The combination of computer and software that you use to access the services is called the *client.* In most cases, the client software is located on your workstation and the server resides on a remote computer. (2) In an X environment, a software component located on your workstation that lets you access (that is, it "serves up") application programs. These programs are known as clients, and in most cases they run on a remote computer. See also **AppleShare file server, AppleShare print server, client, DECwindows, MacX, VAXshare file server, VAXshare print server, X Window System.**

service Software that performs a particular function on a network and that is available to users on the network.

Session Manager A DECwindows application program that lets you start other programs, lets you customize the DECwindows working environment, and provides status information about the interaction between your Macintosh computer and other DECwindows programs. See also **DECwindows application program.**

spool To capture (or temporarily store) output destined for a slow device, such as a printer, on a faster device, such as a print server, until the data can be processed. Comes from *SPOOL,* which stands for *shared-peripheral operations on line.*

spooler See **print spooler.**

startup volume A VAXshare file-server volume that you have selected to appear on your desktop automatically when you start your computer.

subdirectory A list of files that form a subset of a directory or a superordinate subdirectory. (Just as directories can be divided into subdirectories, a subdirectory can be divided into other subdirectories.) In the Macintosh environment, a folder corresponds to a subdirectory.

System file A file that Macintosh computers use to start up and to provide systemwide information.

terminal emulation tools One of the three types of communications tools. The terminal emulation tool that you use determines the type of terminal that your Macintosh will emulate during the communications session. Examples: TTY, VT102 Tool, VT320 Tool. See also **communications tools.**

terminal service A service on a host computer, such as a VAX, that users can access from terminals connected to the host. Often refers to an account on a VAX computer. Users can log in to this account to interact with the operating system. Other terminal services might include word processing or accounting programs. You can access terminal services from your Macintosh computer by using communications software such as MacTerminal, together with a connection and a terminal emulation tool.

terminal service application program A program that you can use from a computer terminal without first having to log in to the computer on which the program runs.

text files Simple files that use ASCII codes to represent letters, numbers, and other printable characters.

troubleshoot To locate and correct an error, or the cause of a problem or malfunction, in hardware or software.

type code A 4-character code assigned to a file that signifies the file type.

UAM See **Apple Standard UAM, log-on method, VMS UAM.**

ULTRIX Digital's version of UNIX—a full 32-bit operating system that takes advantage of the VAX system architecture.

VAXshare file server On an Apple and Digital network, software running on a VAX computer that stores documents, folders, and programs, using the VAX computer's hard disk as its storage device. If you have the AppleShare workstation software installed on your computer, you can access the stored files and can also store your own files on the server and share them with other users. See also **AppleShare file server.**

VAXshare print server On an Apple and Digital network, software running on a VAX computer that stores documents sent to it and that manages the printing of those documents on network PostScript printers, including Digital high-speed, high-resolution printers and LaserWriter printers. If you have PATHWORKS for Macintosh installed on your computer, you can submit a job to the print server and then use your Macintosh for other tasks while the print server controls the printing of your files. See also **AppleShare print server.**

VMS An operating system that can run on all of Digital's VAX computers.

VMS UAM Stands for *VMS User Authentication Method.* An optional log-on method for VAXshare file servers. If you install this log-on method on your Macintosh, you are given the chance to select it rather than the Apple Standard UAM when you select a file server. If you select this method, you can use a password of up to 31 characters in length. See also **Apple Standard UAM, log-on method.**

volume A general term referring to a storage device (such as a hard disk) or part of a storage device formatted to contain files. A volume can be an entire disk, or it can be a part of a disk that appears to users as a separate storage device. A volume has a name and a directory that lists the files on the volume.

WAN See **wide area network.**

wide area network (WAN) A system of interconnected local area networks that spans a wide geographical area. The local area networks are connected by long-distance communications methods such as telephone lines and satellites. Compare **local area network.**

window manager A client that allows you to move, resize, and change the appearance of windows on the screen.

workstation A computer connected to a network.

XMODEM A method of transferring data between two computers that includes error checking and correction. The XMODEM File Transfer Tool provides XMODEM file-transfer capability for Macintosh application programs, such as MacTerminal, that support the Macintosh Communications Toolbox.

X Window client An application program, running on a remote computer, that you access through an X server. For example, DECwindows programs are X clients that run on VAX computers; you access them with the MacX server on your Macintosh computer. See also **DECwindows application program, X Window server, X Window System.**

X Window environment A computing environment based on the X Window System. When you use MacX to access DECwindows programs, you are working in an X environment. See also **X Window System.**

X Window server A component of an X environment that runs on your own computer and provides access to X clients running on remote computers. For example, MacX is an X server that runs on your Macintosh computer and lets you access DECwindows programs, which are X clients that run on VAX computers. See also **MacX, X client, X Window System.**

X Window System A network-based system of programs (called *clients*) and servers. The X Window System provides a graphical interface by which you can access X clients running on a remote computer from a server running on your computer. (A graphical interface displays graphical elements, such as windows, menus, and buttons, rather than alphanumeric characters.) For example, DECwindows is a version of the X Window System that is implemented on VAX computers. See also **DECwindows, MacX, X Window client, X Window server.**

zone A conceptual (rather than physical) grouping of devices and services on a network or internet that makes it easier to locate and access network services. Network users, devices, and services residing in the same zone can be in separate buildings or even in different cities. The system administrator defines zones. To access a device or service, the user chooses the zone where the device resides. Because network devices and services are divided into logically related groups, users can locate a desired device or service by searching through relatively small lists rather than a single large list. In AppleTalk Phase 2, a single network can contain several zones, and a single zone can cross several networks.