PATHWORKS™ for Macintosh®

Network Services User's Guide

AA-PBFKB-TE

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Network Services User's Guide

The Apple Publishing System

Network Services User's Guide was written, edited, and composed on a desktop publishing system using Apple Macintosh® computers and Microsoft® Word. Proof pages were created on the Apple LaserWriter printers; final pages were printed on a Linotronic® 300. Line art was created using Adobe Illustrator® an Aldus Freehand™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of Garamond. Bullets are ITC Zapf Dingbats®. Some elements, such as program listings, are set in Apple Courier, a fixed-width font.

Contents

Overview of the User's Guides

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

How to use the binders

PATHWORKS for Macintosh comes with a set of three user's guides:

- 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, and explains how to use PATHWORKS for Macintosh to access network services running on VAX™ computers.
- The *PATHWORKS for Macintosh: MacTerminal User's Guide* tells you how to use the MacTerminal® communications application supplied with PATHWORKS for Macintosh. MacTerminal 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™ application 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.

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 list that follows is for network users. If your Macintosh is connected to a VAX computer by means of a modem or a serial cable, see "Modem or Serial Connection," which follows.) The road map, later in this part, should also help you determine the best way to use these guides.

- **Complete introduction**

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

  1. Use the *Installation* part of this binder to help you install the software.
  2. Read the Preface and Chapter 1 of the *Using Network Services* part of this binder.
  3. For each network service that you want to use, read the chapter describing that service in *Using Network Services*.
  4. For complete information on using terminal services, read the *MacTerminal User's Guide*.

  For complete information on MacX and DECwindows applications, read the *MacX User's Guide*.

- **Quick start**

  If you want to dig right in and start using a particular network service, follow the previous steps for "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 the VAX. Use the guides in this way:

1. Use the *Installation* part of this binder to help you install the software.
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*.

Terminology used in this binder

The terms *log on/log off* and *log in/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.

Visual 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:

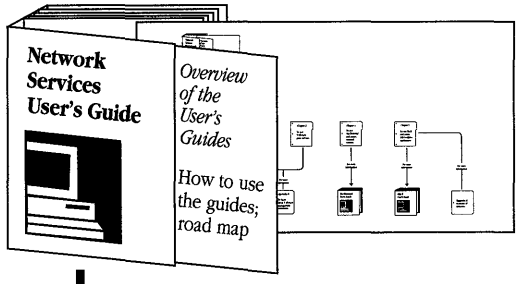
◆ **Note** Text set off in this manner presents additional information or interesting sidelights. ◆

△ **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 two binders relate to this one.



Installation

To install PATHWORKS for Macintosh

Using Network Services

To use the network services

Chapter 1

Introduction

Chapter 2

To use VAXshare file services

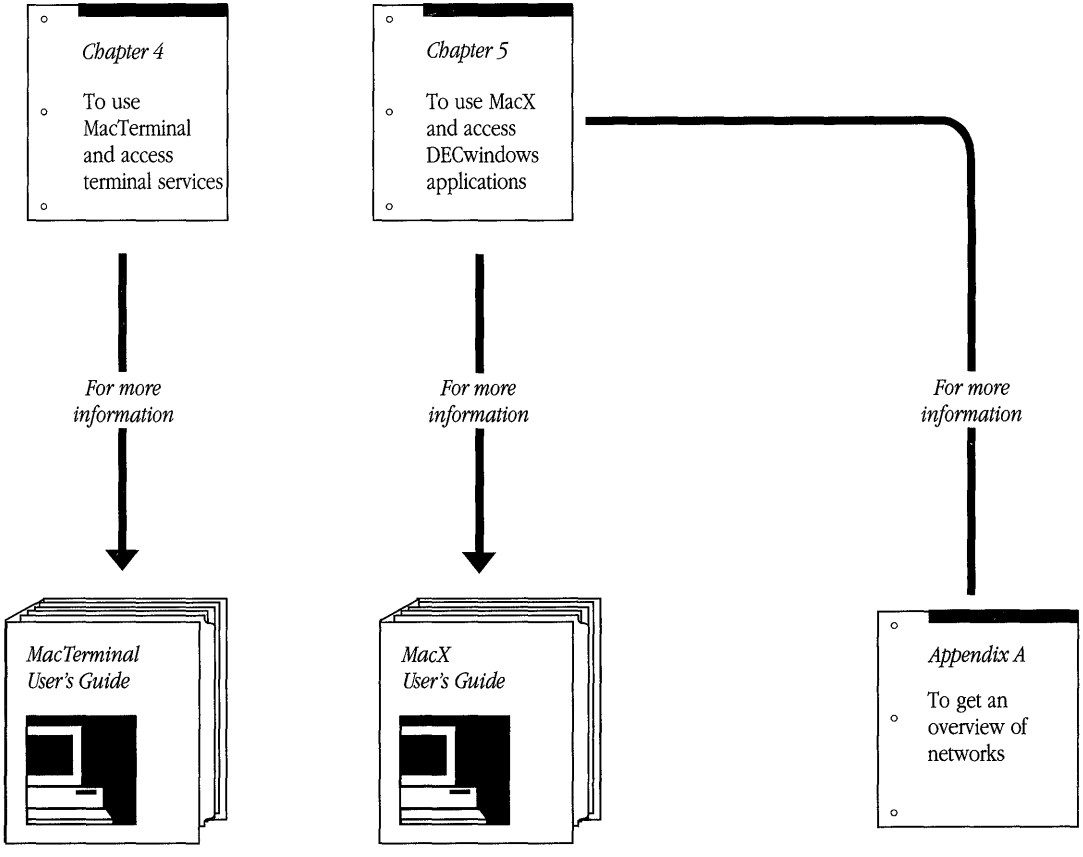
Chapter 3

To use VAXshare print services

For more information

Appendix B

To learn about VAXshare management commands


Chapter 4
To use MacTerminal and access terminal services
Chapter 5
To use MacX and access DECwindows applications
For more information
For more information
For more information
MacTerminal User's Guide
MacX User's Guide
Appendix A
To get an overview of networks

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. 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 application called the PATHWORKS Installer, which helps you install the necessary software on your Macintosh. *The PATHWORKS Installer* works with a script document called *Apple-Digital Installation.* The script document determines which software components are installed. As with most Macintosh applications, you can start the PATHWORKS Installer and then open the script document from within the application, or you can open the script document from the Macintosh desktop, which will automatically start the PATHWORKS Installer.

◆ **Note** The PATHWORKS Installer installs only the support software for PATHWORKS for Macintosh. As described in the sections that follow, you must manually install applications and their related files by dragging the files onto your hard disk or onto the network file-server volume that you're using. In addition to the installation procedures described in this part of the guide, you will need to configure the communications tools before you use them. See the reference module for the tool or tools that you want to use. ◆

The PATHWORKS Installer lets you take either of two approaches:

- Install all software components at once.
- Install only the components for one or more specific services.

The first approach is the easier one. "Installing Software for All Services," later in this part of the guide, presents a procedure for installing onto your hard disk all of the Macintosh components at once.

However, if you expect to use only one or two of the services—or if available memory is limited—you may choose to install only the components for those services that you intend to use. "Installing Software for Individual Services," 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, "About the Software Components," later in this part of the guide, provides details about each of the components of PATHWORKS 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 computer from one of the following groups:
  - Macintosh Plus
  - Macintosh Portable
  - Macintosh SE family
  - Macintosh II family
- 1 megabyte (MB) of memory (2–4 MB if you plan to use MacX™)
- one hard disk drive or two floppy disk drives (one floppy disk drive may work under limited circumstances; a hard disk is recommended, and required if you plan to use MacX)

System software requirements

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

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

The AppleShare® workstation software is required because you install the Macintosh software for PATHWORKS for Macintosh from a VAXshare™ file server. The AppleShare workstation software provides access to VAXshare and AppleShare file servers.

Note that technically the AppleShare workstation software is a set of **resources** that is an extension of the system software. The resources are installed as part of the System file in your System Folder; they do *not* exist as a separate file. Because of this, you must install the AppleShare resources by using the Installer application supplied with AppleShare. (The AppleShare Installer is *not* the same application as the PATHWORKS Installer.)

Alternatively, you can use the *PATHWORKS Installer* disk as your startup disk. It also has the AppleShare resources installed in the disk's System file, allowing you to connect to a VAXshare file server. (If you don't have a *PATHWORKS Installer* disk, you can obtain one from your system administrator.)

◆ **Note** If you are connected to an Ethernet environment through an Ethernet card not manufactured by Apple Computer, you may not be able to connect to VAXshare file servers by using the *PATHWORKS Installer* disk as your startup disk. ◆

If your Macintosh 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 device. See "Selecting a Network Connection" in Chapters 2, 3, 4, or 5. ◆

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.)

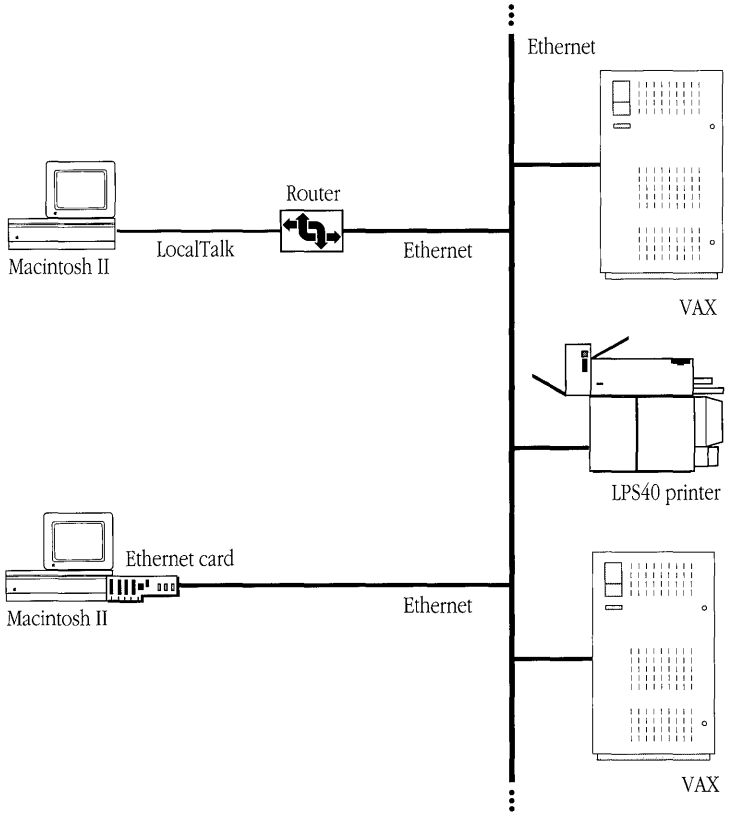


Figure I-1 Connecting your Macintosh to a Digital network

A Macintosh computer can also be connected directly to an Ethernet environment by means of an Ethernet card. Whereas the ability to connect to and communicate through 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 Ethernet cards work with 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. See Chapter 4, "Terminal Services," in the *Using Network Services* part of this guide.

Installing software for all services

This section tells you how to install on your hard disk the complete set of Macintosh software components for PATHWORKS for Macintosh.

To install software for all services on your hard disk:

1 **Start your Macintosh.**

You should already have AppleShare workstation software installed on your hard disk, as described in the preceding section, "Hardware, System Software, and Network Connection Requirements."

2 **Mount and open the VAXshare server volume called *PATHWORKS V1.0.***

The steps that follow show how to mount and open the PATHWORKS V1.0 volume. For more detailed instructions, see Chapter 2 of the *Using Network Services* part of this guide. 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 V1.0 volume, check with your system administrator.

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

b. If your network is divided into **zones,** select the zone that has the VAXshare file server containing the PATHWORKS V1.0 volume.

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

d. Select the VAXshare file server containing the PATHWORKS V1.0 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.

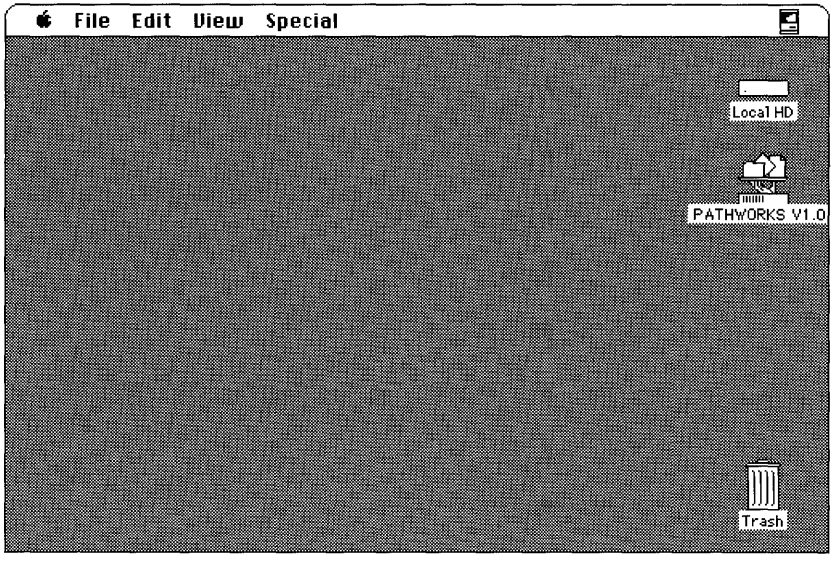
e. If you have a VMS™ account on the VAX that is running the file server, select Registered User and enter your user name and password. Otherwise, select Guest. Click the OK button. (If you want to select Guest and the Guest option is unavailable, see your system administrator.)

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

f. Select the PATHWORKS V1.0 volume and click the OK button.

g. Close the Chooser.

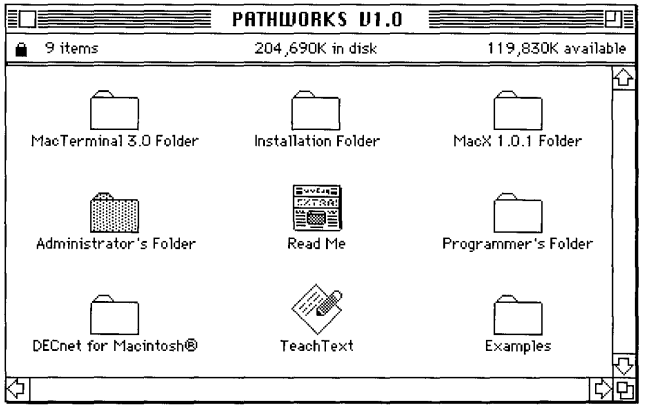
   The PATHWORKS V1.0 volume should soon appear on your Macintosh desktop.



h. Open the PATHWORKS V1.0 volume.

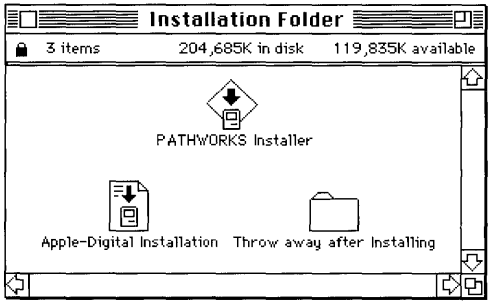
The volume contains the following components:

- Installation Folder.
- Read Me document.
- TeachText application. This application lets you open the Read Me document.
- Application folders—MacTerminal® 3.0 Folder and MacX 1.0.1 Folder.
- Examples folder. This folder contains mBin, a MacBinary converter (for more information, see "Working with Documents on a VAXshare File Server" in Chapter 2). This folder also contains Backup-Mac.Com, an automatic backup utility that works on Macintosh computers that are using DECnet™.
- Programmer's Folder. This folder contains support files and utilities for programmers. Unless you are a programmer, you do not need to do anything with this folder.
- Administrator's Folder. This folder contains support files and utilities for system administrators. Unless you are a system administrator, you do not need to do anything with this folder.
- DECnet for Macintosh folder. For information about this folder's contents, and about installing and configuring DECnet software, see the *DECnet for Macintosh User's Guide.*



3 **Drag the Installation Folder to your hard disk.**

The Installation Folder contains the PATHWORKS Installer application, the Apple-Digital Installation script, and a folder containing the software resources used by the Apple-Digital Installation script.



△ **Important** The Installation Folder must be at the root level of your hard disk—that is, at the top level of the hard disk's directory. Do not put it inside another folder. △

4 **Drag the application folders to your hard disk.**

There are two application folders that you may want to install:

- MacTerminal 3.0 Folder
- MacX 1.0.1 Folder

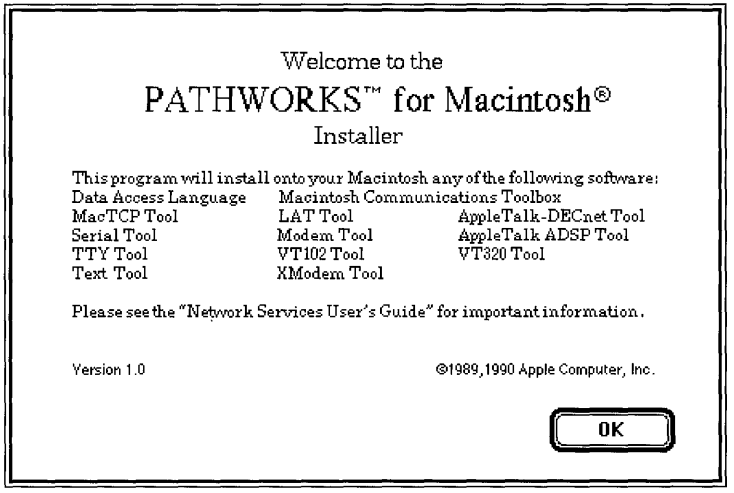
Copying the application folders, especially the folder for MacX, may take a few minutes. For a description of MacTerminal, see Chapter 4 in the *Using Network Services* part of this guide. For a description of MacX, see Chapter 5.

5 **Restart your Macintosh from the *PATHWORKS Installer* disk.**

The *PATHWORKS Installer* disk is preconfigured to run under MultiFinder®, which is required for the next step.

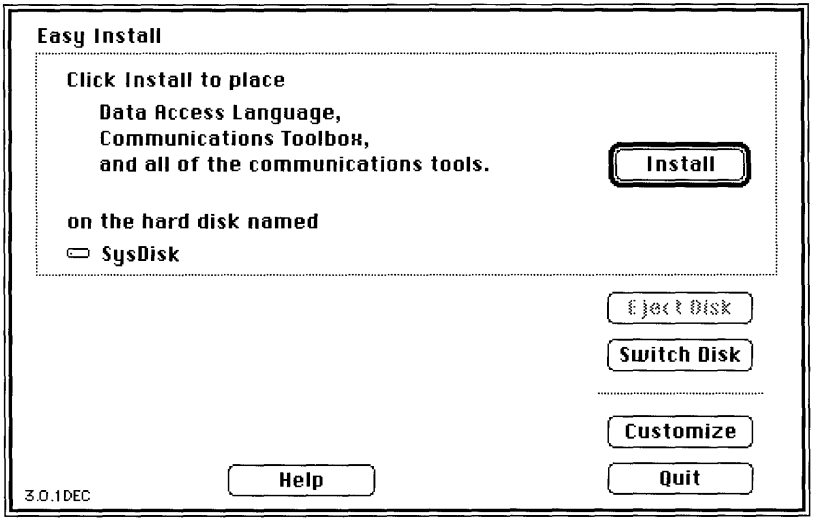
6 **Open the Installation Folder on your hard disk and start the PATHWORKS Installer by double-clicking the icon for the Apple-Digital Installation script document.**

The PATHWORKS Installer opening screen appears.



7 Click the OK button.

The Easy Install dialog box appears.



8 **Click the Install button.**

◆ **Note** The Customize button lets you install software for individual services. This procedure is described in the next section, "Installing Software for Individual Services." ◆

9 **When you have successfully completed the installation, quit the PATHWORKS Installer and drag the Installation Folder to the Trash.**

Installing software for individual services

This section tells you how to install the software that you need to use individual services. By using the Customize option in the PATHWORKS Installer application, you can install one or more of the network services on your Macintosh.

Table I-1 shows the Macintosh software components required for each of the network services. "About the Software Components," later in this part of the guide, describes these components in detail.

To install software for individual network services:

1 **Start your Macintosh.**

You should already have AppleShare workstation software installed on your hard disk, as described in "Hardware, System Software, and Network Connection Requirements" earlier in this part of the guide.

2 **Mount and open the VAXshare server volume called *PATHWORKS V1.0*.**

The following steps summarize how to mount and open the PATHWORKS V1.0 volume. (For more detailed instructions, see Chapter 2 of the *Using Network Services* part of this guide.) 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 V1.0 volume, check with your system administrator.

Table I-1 Software configurations for PATHWORKS for Macintosh

VMS Service	Application and support files	System file resources	System Folder	Communications Folder: *Connection Tools*	Communications Folder: *Terminal Emulation Tools*	Communications Folder: *File Transfer Tools*
VAXshare file services		AppleShare EtherTalk 2.0[1]	AppleShare AppleShare Prep EtherTalk 2.0[1] VMS UAM[2]			
VAXshare print services		EtherTalk 2.0[1]	LaserWriter Laser Prep EtherTalk 2.0[1]			
Terminal services						
LAT connection	MacTerminal	Communications Toolbox EtherTalk 2.0	EtherTalk 2.0 LAT	LAT Tool	VT100 or VT320 Tool	Text[3] or XMODEM[3] Tool
CTERM connection	MacTerminal	Communications Toolbox EtherTalk 2.0[1]	DECnet/Mac EtherTalk 2.0[1]	CTERM Tool	VT100 or VT320 Tool	Text[3] or XMODEM[3] Tool
Serial connection	MacTerminal	Communications Toolbox		Serial Tool	VT100 or VT320 Tool	Text[3] or XMODEM[3] Tool
Modem connection	MacTerminal	Communications Toolbox		Apple Modem Tool	VT100 or VT320 Tool	Text[3] or XMODEM[3] Tool

(continued)

Table I-1 Software configurations for PATHWORKS for Macintosh *(continued)*

VMS Service	Application and support files	System file resources	System Folder	Communications Folder: *Connection Tools*	Communications Folder: *Terminal Emulation Tools*	Communications Folder: *File Transfer Tools*
DECwindows applications						
AppleTalk /DECnet Transport Gateway connection	MacX MacX Colors Font Directory MacX Fonts folder	Communications Toolbox EtherTalk 2.0[1]	ADSP EtherTalk 2.0[1]	AppleTalk-DECnet Tool		
DECnet connection	MacX MacX Colors Font Directory MacX Fonts folder	Communications Toolbox EtherTalk 2.0[1]	DECnet/Mac EtherTalk 2.0[1]	DECnet Tool		
TCP/IP connection	MacX MacX Colors Font Directory MacX Fonts folder	Communications Toolbox EtherTalk 2.0[1]	MacTCP AdminTCP EtherTalk 2.0[1] Hosts	MacTCP Tool		

[1] Required if connecting through an Ethernet card.

[2] Required if you want to use a password of more than 8 characters for VAXshare file servers. The VMS UAM file must be placed in a folder called Appleshare Folder, which in turn is placed in the System Folder.

[3] Required if you plan to transfer files.

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

b. If your network is divided into zones, select the zone that has the VAXshare file server containing the PATHWORKS V1.0 volume.

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

d. Select the VAXshare file server containing the PATHWORKS V1.0 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 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 V1.0 volume and click the OK button.

g. Close the Chooser.

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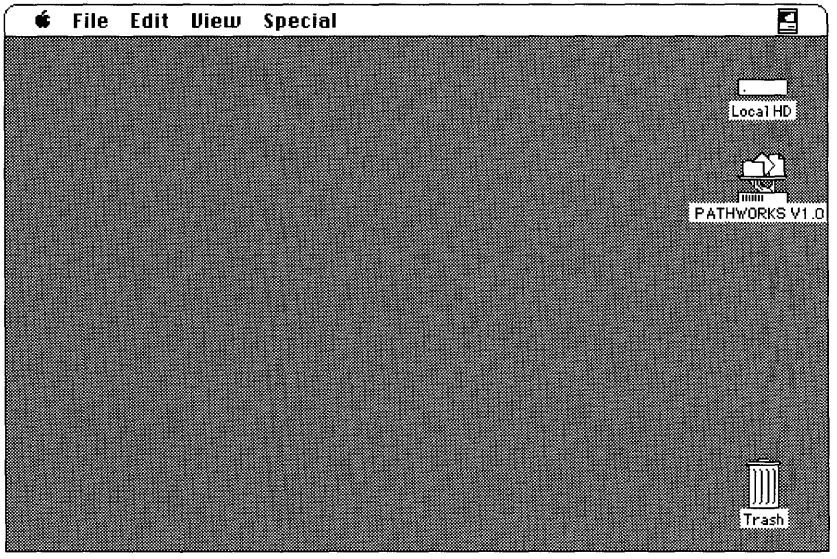

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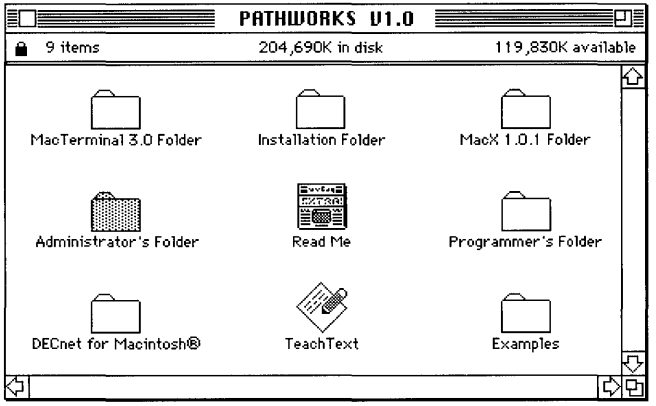

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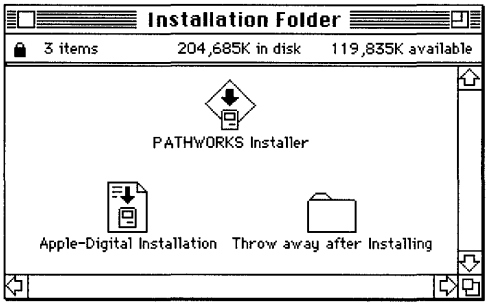

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There are two application folders that you may want to install:

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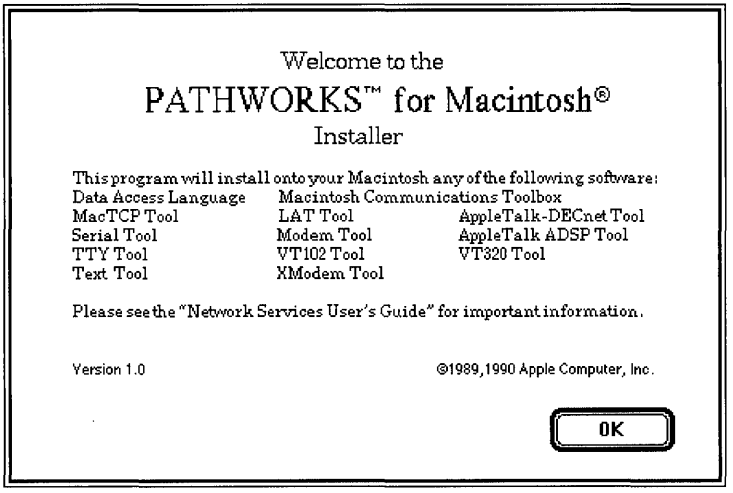
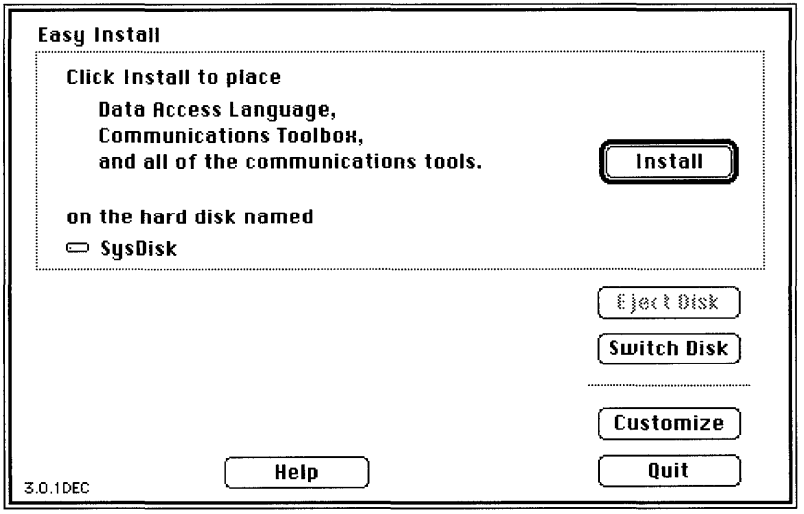


7 **Click the OK button.**

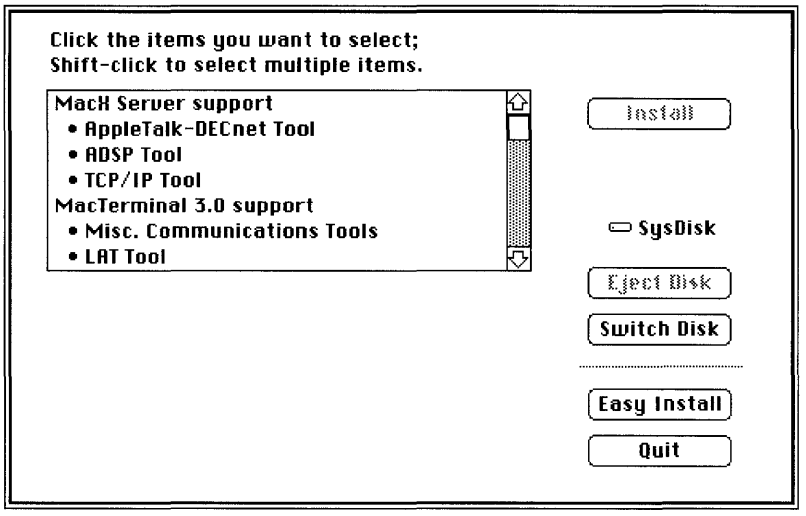
The Easy Install dialog box appears.



◆ **Note** Clicking the Install button installs all of the network services at once, as described in the preceding section, "Installing Software for All Services." ◆

8 Click the Customize button.

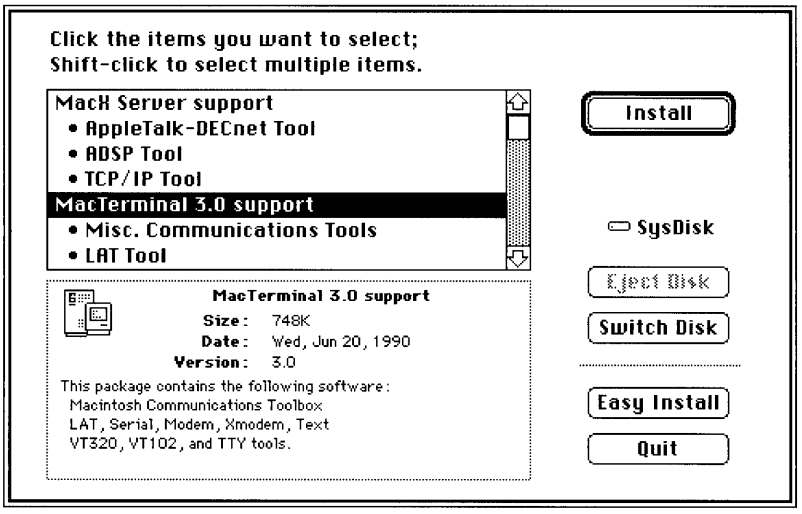
The custom-install dialog box appears.



9 Select the individual services that you want to use.

Shift-click to add multiple services to or remove them from your group of selections. Note that you can select single components, as well as the software for an entire service.

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



10 **Click the Install button.**

11 **When you have successfully completed the installation, quit the PATHWORKS Installer and drag the Installation Folder to the Trash.**

About the software components

This section describes the Macintosh software components for 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, why they are needed, and where they reside on your Macintosh desktop.

The next two figures show the Macintosh components. Figure I-2 shows the application folders, which contain the PATHWORKS for Macintosh applications that reside on your local computer and their related files. The PATHWORKS Installer does *not* install the applications or their related files. You must install these components by dragging them to your Macintosh disk drive from the VAXshare volume, as described in the various installation procedures in this part of the guide.

Figure I-3 shows the communications tools, software drivers, and other components that go in the System Folder or in a folder within the System Folder. These are the components installed automatically by the PATHWORKS Installer application. With the exception of the AppleShare resources, Communications Toolbox, and EtherTalk resource—which are extensions of the System file that must be installed by installer applications—you can install the System Folder components manually by dragging them to the appropriate folder, as indicated in the figure.

Applications and related files

An application is software that performs a specific task. The applications provided with PATHWORKS for Macintosh perform specialized communications tasks in conjunction with various services on the network. All of the Macintosh applications for PATHWORKS for Macintosh work with the Macintosh Communications Toolbox, which is described in the next section.

These are the application files supplied with PATHWORKS for Macintosh:

- **MacX**—provides a Macintosh-based X server that allows you to run DECwindows applications and other X clients that reside on remote computers. MacX requires several related files for its operations. With the exception of the Hosts file, you can install these files either in your System Folder or in the folder that contains your MacX application. You do not need to install the Hosts file, which resides in your System Folder. The Hosts file is used only in TCP/IP connections; MacX creates the file if it is missing.
  - **Hosts file**—provides node address and other information for TCP/IP connections to remote computers.
  - **MacX Colors file**—contains an array of colors. You can add, modify, or delete colors by using the MacX Color Namer.
  - **MacX Font Director** (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 Director also permits you to assign aliases to long, unwieldy font names.
  - **MacX Fonts folder**—contains files for a variety of fonts. Each file contains a single font.

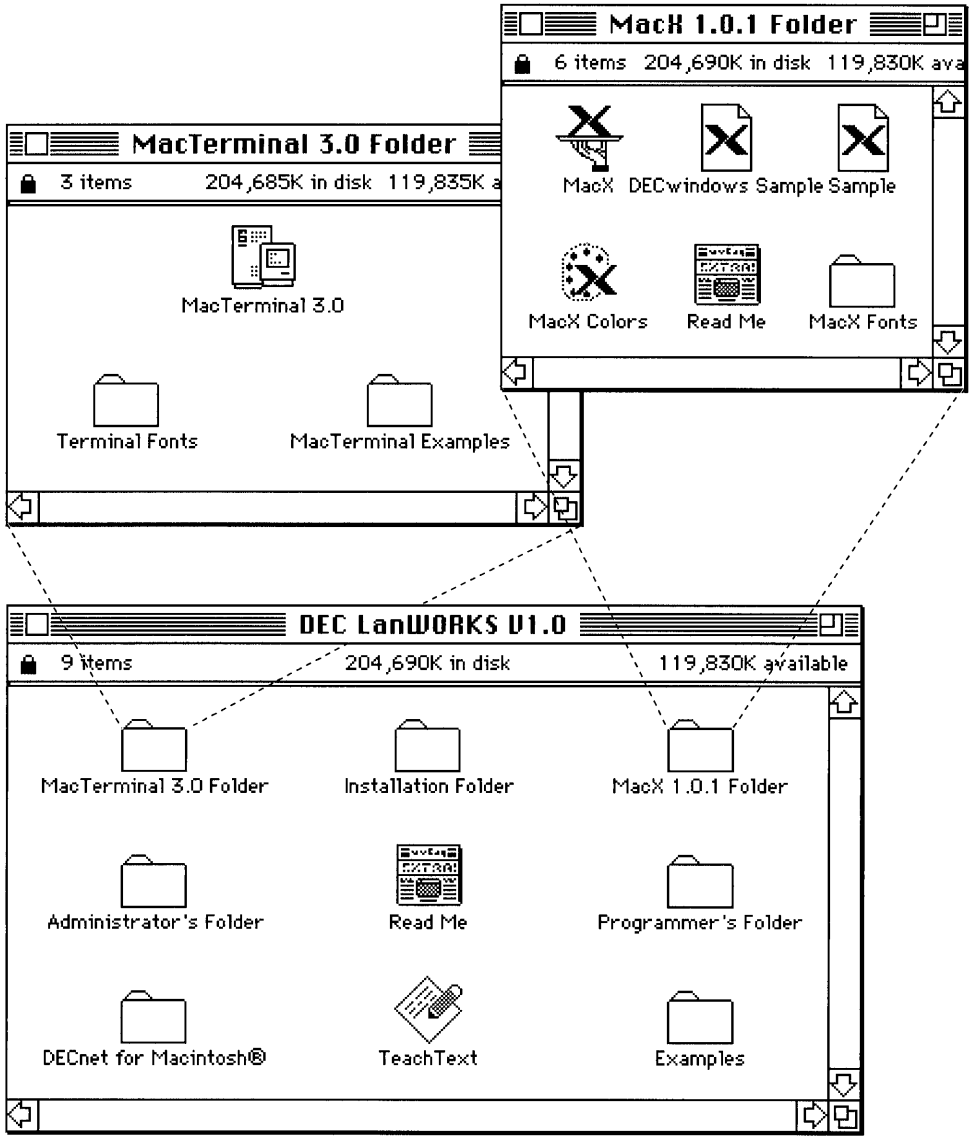


Figure I-2 Application folders

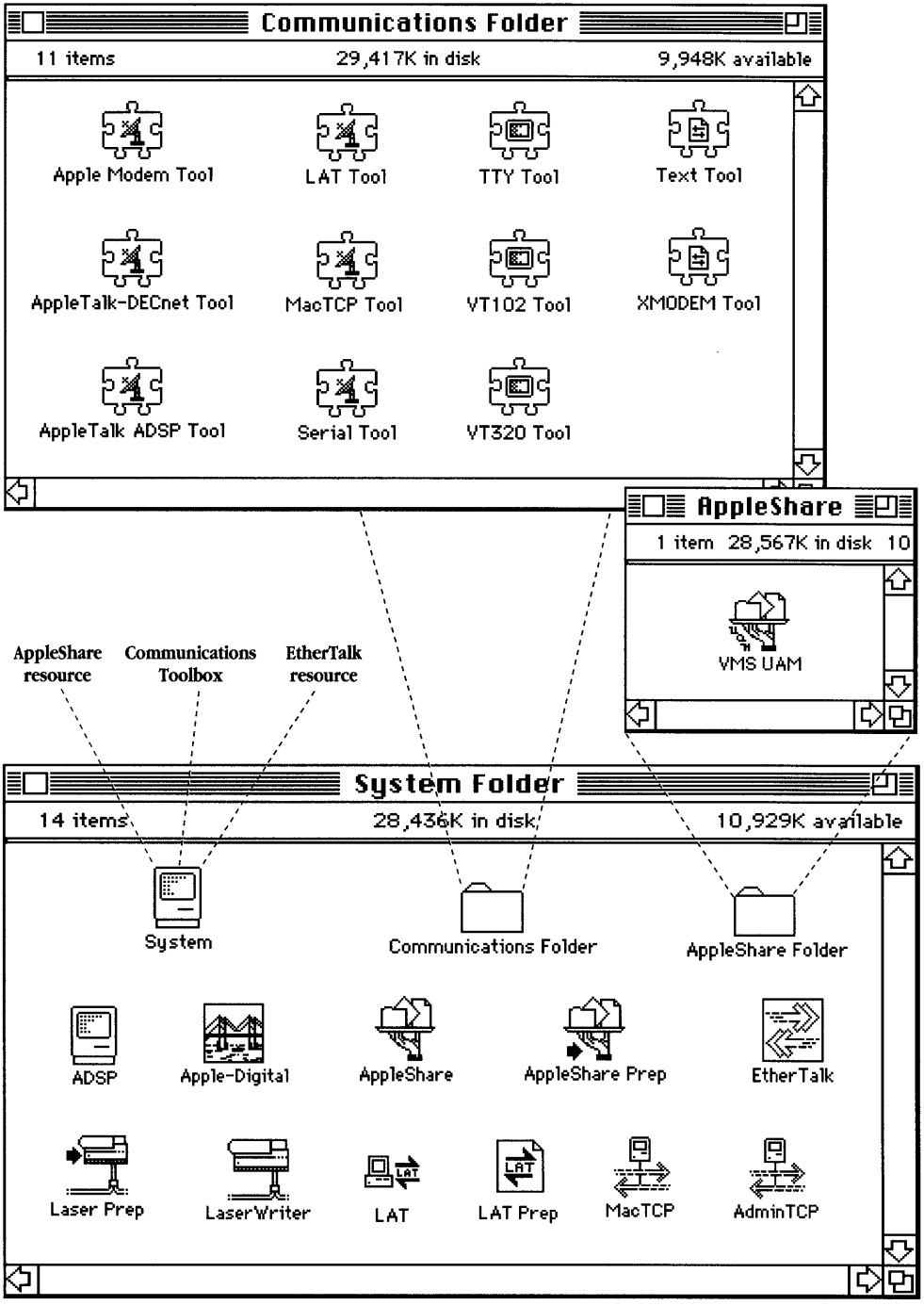


Figure I-3 System Folder components

The MacX folder—including the MacX application, MacX Fonts folder, and other related folders and files—requires approximately 5 MB of disk storage space.

- **MacTerminal**—performs general communications tasks, giving you access to VMS terminal services.

Macintosh Communications Toolbox

The Macintosh Communications Toolbox is an extension to the Macintosh system software that manages communications tasks for Macintosh applications. The Communications Toolbox works in conjunction with **communications tools** (described in the next section), which perform specific communications tasks. Macintosh communications applications that support the Communications Toolbox, such as MacTerminal and MacX, rely on the Communications Toolbox and communications tools to establish connections and take care of other aspects of communicating with remote computers.

The Communications Toolbox is a resource of the System file and must be installed by the PATHWORKS Installer application.

Communications tools

The Macintosh Communications Toolbox works with communications tools, which handle specific communications tasks for Macintosh applications. Communications tools, which must be installed in the Communications Folder, fall into three categories:

- connection tools
- terminal emulation tools
- file-transfer tools

The next three sections list the communications tools in each category that are supplied with PATHWORKS for Macintosh. For more information about communications tools, see the *Communications Tools Reference* part of the *MacTerminal User's Guide* and the *Connection Tools Reference* part of the *MacX User's Guide*.

Connection tools

- **Apple Modem Connection Tool**—provides modem connections for MacTerminal.
- **AppleTalk ADSP Connection Tool**—provides **AppleTalk Data Stream Protocol** connections for MacTerminal and Data Access Language (DAL) applications.
- **AppleTalk-DECnet Connection Tool**—provides **AppleTalk/DECnet Transport Gateway** connections for MacX.
- **LAT Connection Tool**—provides Local Area Transport (LAT) connections for MacTerminal.
- **MacTCP Connection Tool**—provides TCP/IP connections for MacX only.
- **Serial Connection Tool**—provides serial connections for MacTerminal.

Terminal emulation tools

- **TTY Terminal Emulation Tool**—provides TTY terminal emulation for MacTerminal.
- **VT102 Terminal Emulation Tool**—provides VT102 terminal emulation for MacTerminal.
- **VT320 Terminal Emulation Tool**—provides VT320 terminal emulation for MacTerminal.

File-transfer tools

- **Text File Transfer Tool**—provides the capability to send plain text files for MacTerminal.
- **XMODEM File Transfer Tool**—provides XMODEM file-transfer capabilities for MacTerminal.

System file resources

System file resources are extensions to the Macintosh Operating System. They are different from the other software components in that you must install them in the System file with installer applications. (You can install the other components by dragging the files to appropriate folders.)

- **AppleShare**—provides access to AppleShare and VAXshare file and print services.
- **Communications Toolbox**—manages communications functions for Macintosh applications.
- **EtherTalk 2.0**—allows your Macintosh to communicate with AppleTalk protocols over Ethernet cables.

Chooser devices, Control Panel devices, communications drivers, and prep files

Chooser devices, Control Panel devices, communications drivers, and prep files all are installed in the System Folder.

Chooser device files are the resources that provide the icon and connection paths for file servers, print servers, and other external services.

Control Panel device files are the resources for the Control Panel—the device icons and the information that appears in the Control Panel when you select the icons. An example of a Control Panel device is Keyboard, which lets you set the Key Repeat Rate and Delay Until Repeat options for your Macintosh keyboard.

The communications drivers provide **communications protocols** support for Macintosh applications.

Prep files contain configuration information for Macintosh applications and communications software.

Because some of these files are a combination of these types, the files are presented in a single list. The component type(s) appear in parentheses after each file's name.

- **AdminTCP** (Control Panel device)—provides a resource for the Control Panel dialog box that allows you or your system administrator to configure MacTCP.
- **ADSP** (communications driver)—provides support for the ADSP communications protocol used by MacX.
- **Apple-Digital** (Chooser device)—provides resources for the Chooser window and provides a network connection path to an AppleTalk/DECnet Transport Gateway.
- **AppleShare** (Chooser device)—provides access to AppleShare and VAXshare file and print servers.
- **AppleShare Prep** (prep file)—contains your AppleShare settings.
- **EtherTalk** (Chooser device and driver)—provides resources for the Chooser window and permits your Macintosh to communicate by means of AppleTalk protocols over Ethernet cables. Note that PATHWORKS for Macintosh requires EtherTalk Phase 2. (See Appendix A for further information about EtherTalk.)
- **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.
- **LaserWriter** (Chooser device)—provides resources for the Chooser window and provides a network connection path to a LaserWriter® printer.
- **LAT** (Control Panel device and communications driver)—provides resources for the Control Panel dialog box and permits your Macintosh to communicate by using the LAT communications protocol.
- **LAT Prep** (prep file)—contains information about services on the network.
- **MacTCP** (Control Panel device and communications driver)—provides resources for the Control Panel dialog box and permits your Macintosh to communicate by using the TCP/IP communications protocols.
- **VMS UAM**—provides an alternative **log-on method** (also known as a *user authentication method,* or *UAM*) for logging on to VAXshare file servers. The VMS UAM must be placed in the AppleShare folder in the System Folder.

Contents

Figures and Tables

Preface

PATHWORKS™ for Macintosh® allows you to use your Macintosh computer to access services running on Digital Equipment Corporation computers. This preface tells you what you'll find in this part of the *Network Services User's Guide*. For information on the other two user's guides that come with PATHWORKS for Macintosh, and suggestions for using the guides, see the *Overview of the User's Guides* in 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 appropriate 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 computer, 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®, a communications application 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 Applications," tells you how to use MacX™ to access DECwindows applications running 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 *Using Network Services* section 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).

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 applications, 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 application. 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. Rather, the product includes many components—applications, 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 the chapter in *Using Network Services* 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 Figure 1-1, the Macintosh at upper left is linked to the Ethernet environment through its connection to a LocalTalk® network and a **router,** which links the LocalTalk network to Ethernet. 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.

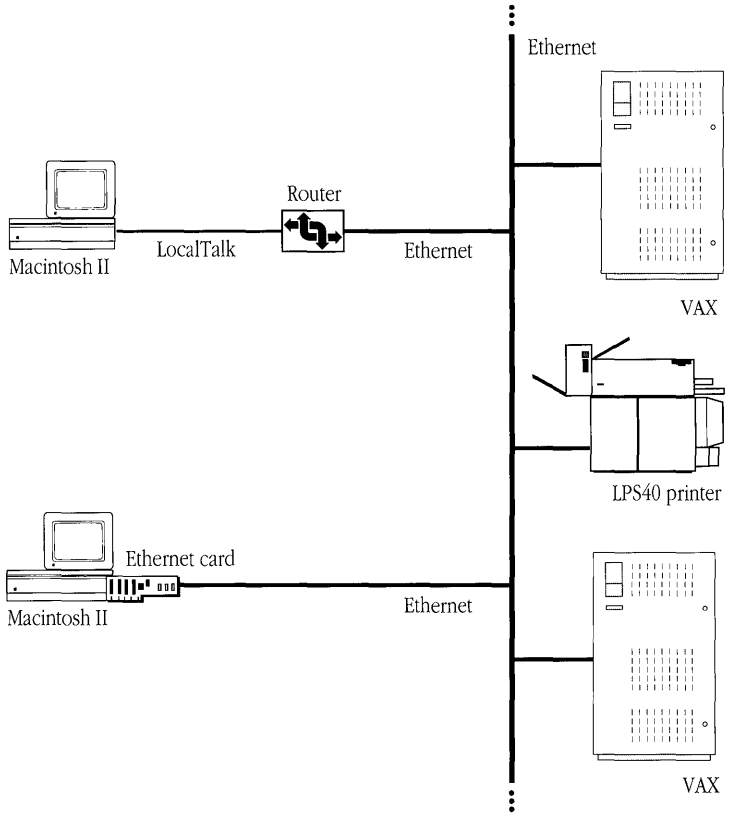


Figure 1-1 Macintosh computers connected to a Digital computer network

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.

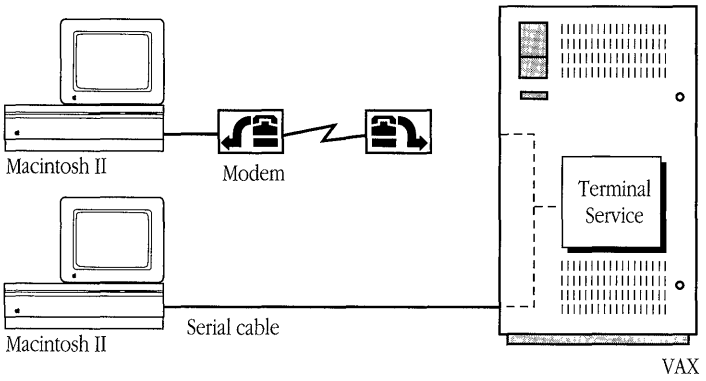


Figure 1-2 Serial and modem connections to a VAX computer

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™ applications

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®, a communications application 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 *MacTerminal User's Guide.*

DECwindows applications

The **MacX™** application, 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 applications** running on VAX computers, such as DECwrite, DECdecision, Calendar, and VAXnotes.

Chapter 5 gives an overview of MacX and the X Window System. It tells you how to start MacX and access DECwindows applications by using the AppleTalk®-DECnet™ Connection Tool. The *MacX User's Guide* explains in detail how to use MacX, including the use of other connection methods. Refer to Digital's user manuals (such as *DECchart: Getting Started)* for information about individual DECwindows applications.

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 applications 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.

◆ **Note** AppleShare file servers (including VAXshare file servers) can be accessed by different types of client computers. For example, with additional software available from Apple Computer, IBM PC-compatible and Apple IIGS® computers can act as clients to AppleShare file servers. ◆

Figure 2-1 shows the software and hardware components involved in using a VAXshare file server. For instructions on installing software components, see the *Installation* part of this guide.

◆ **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. ◆

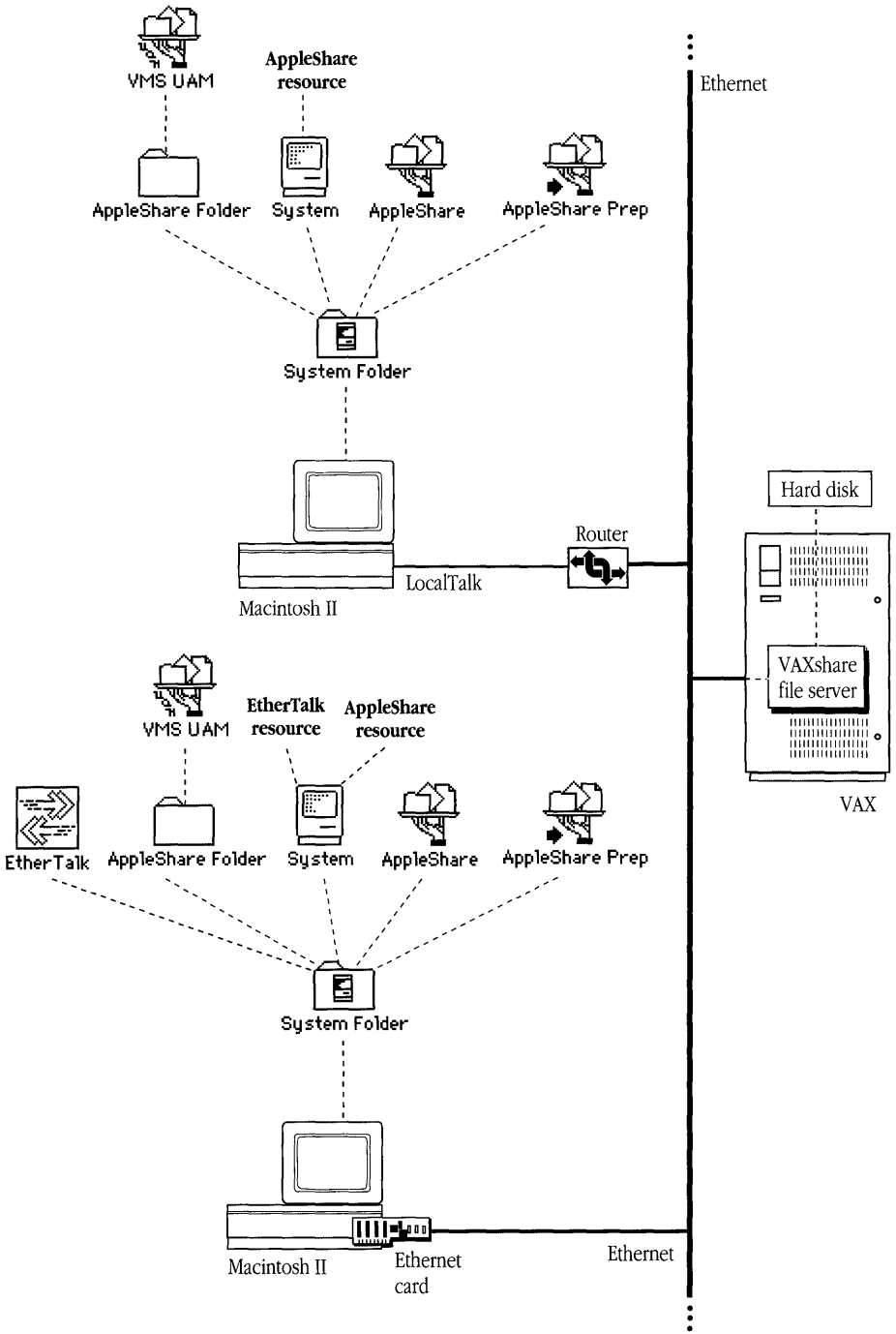


Figure 2-1 Network components for VAXshare file services

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.

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 the VMS UAM.)

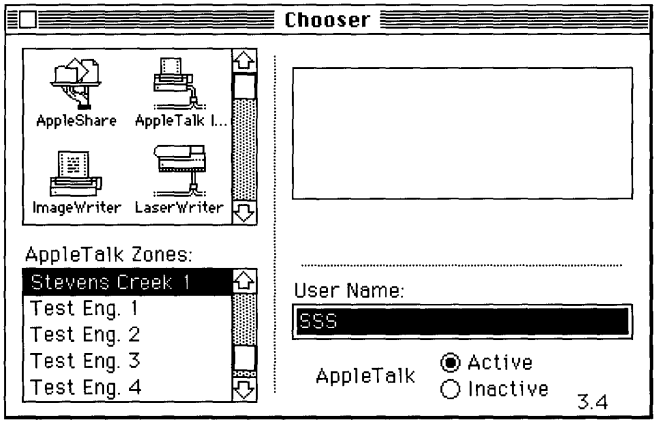
The log-on method that you use determines two things: the maximum password length, and whether or not you can have selected server volumes appear on your desktop automatically when you start up your computer. If you use the preset (default) log-on method, **Apple Standard,** your password is limited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

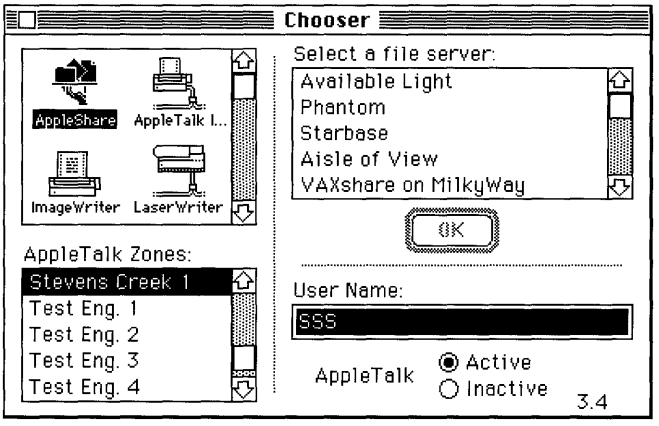


b. Make sure that your Macintosh is physically connected to the network, and select the Active option for AppleTalk, in the lower-right corner of the window.

c. 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.

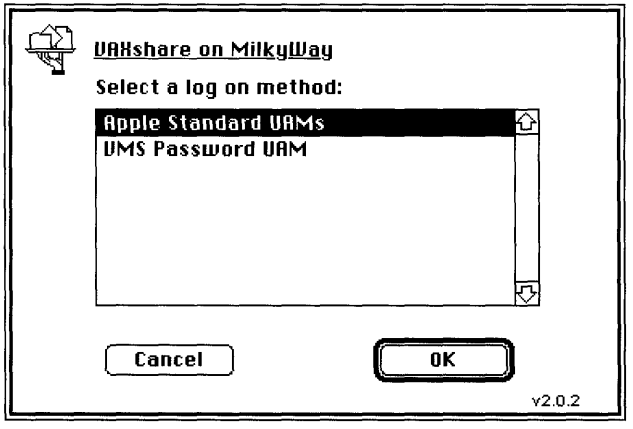
d. Click the AppleShare icon in the group of icons on the left side of the Chooser window.

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.



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.

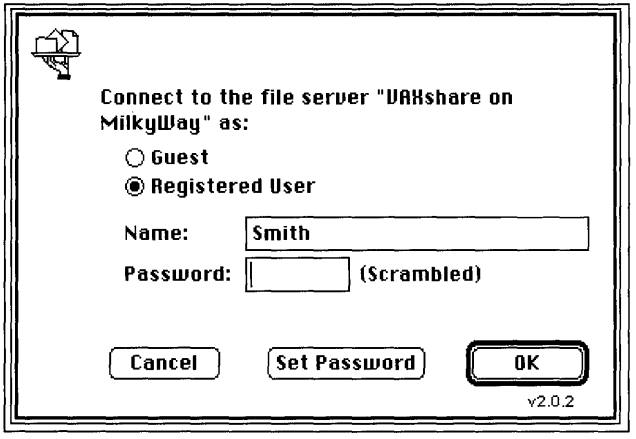


2 Select a log-on method, and click the OK button.

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 on startup. 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.

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.)



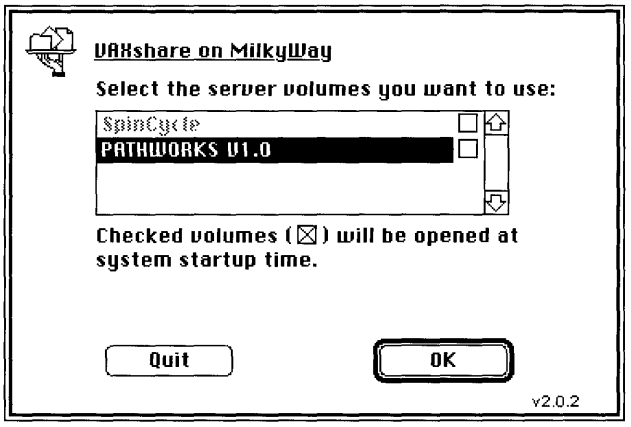
◆ **Note** Logging on to VAXshare is subject to the same restrictions as logging in to VMS on the network. That is, if you do not enter a valid user name and password, you will not be able to log on, and an alert box will appear. Click the OK button. Make sure that your user name and password are correct, 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.

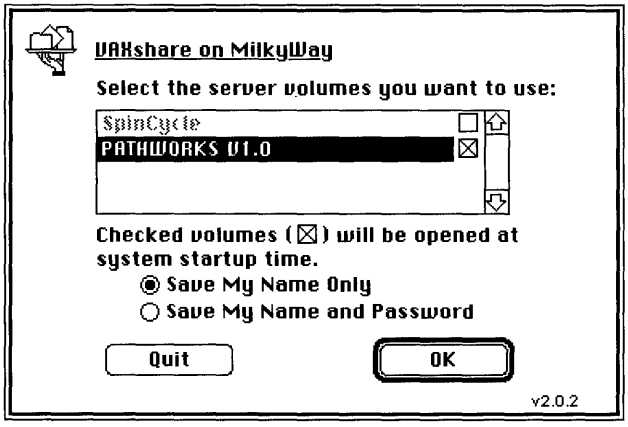


If the dialog box does not appear, there is a problem with the network. Contact your system administrator.

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 V1.0 selected as a volume to appear at startup.



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.

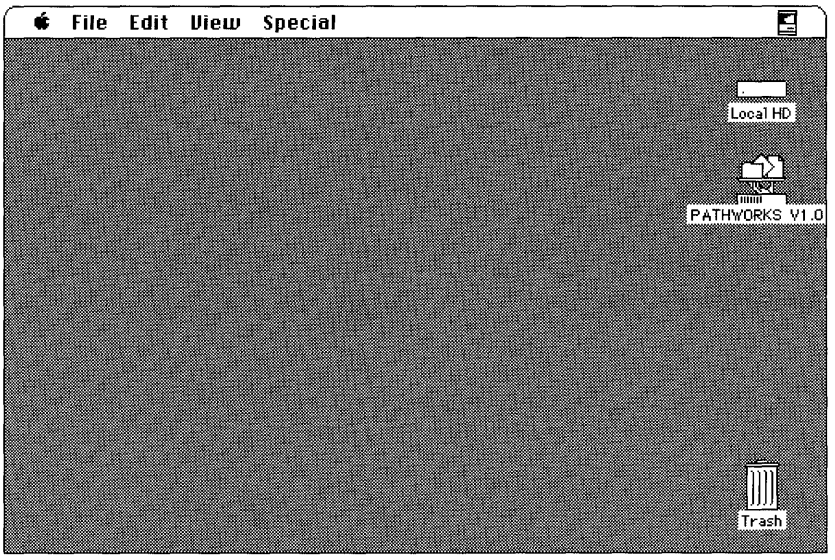
   If you select Save My Name and Password, you won't have to enter your password at startup time; the volumes you've selected will appear on your desktop.

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.**

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 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. (The *Installation* part of this binder gives instructions for installing the VMS UAM log-on method.)

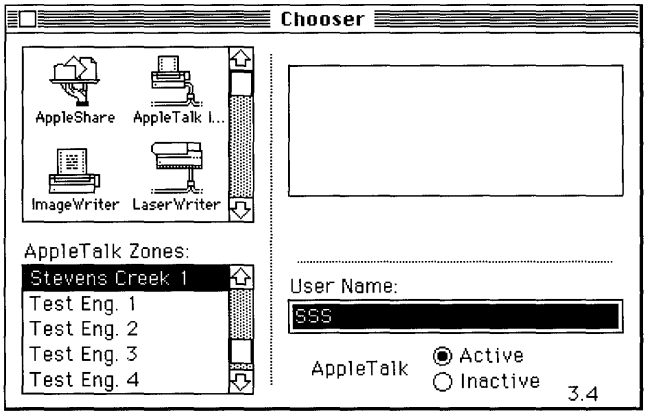
The log-on method that you use determines two things: the maximum password length, and whether or not you can have selected server volumes appear on your desktop automatically when you start your computer. Because you won't be using a password, it doesn't matter which log-on method you use, unless you want to specify startup volumes. If you want to take advantage of this feature, you must use the preset (default) log-on method, Apple Standard. You will be given the opportunity to select the server volumes; once you have specified them, you won't have to log on to the file server and mount the volumes each time you want to use VAXshare.

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 guest:

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

a. Open the Chooser from the Apple (🍎) menu.
The Chooser window appears.

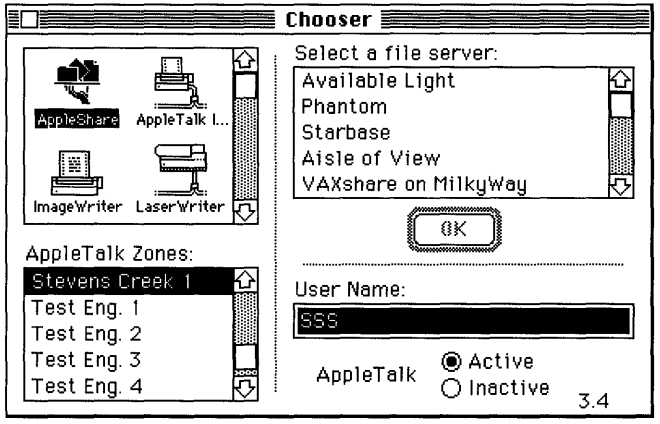


b. Make sure that your Macintosh is physically connected to the network, and select the Active option for AppleTalk, in the lower-right corner of the window.

c. 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.

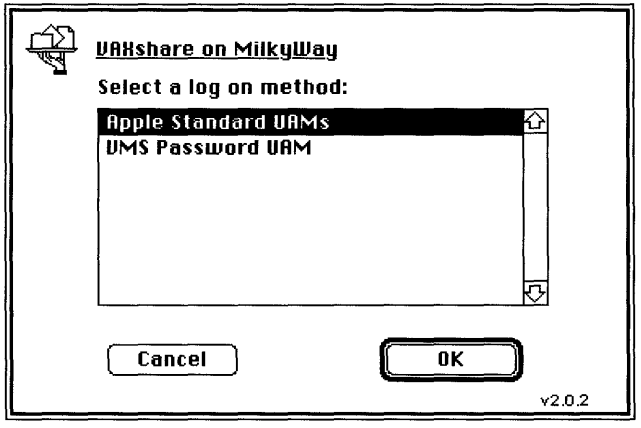
d. Click the AppleShare icon in the group of icons in the upper-left corner of the Chooser window.

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.



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.

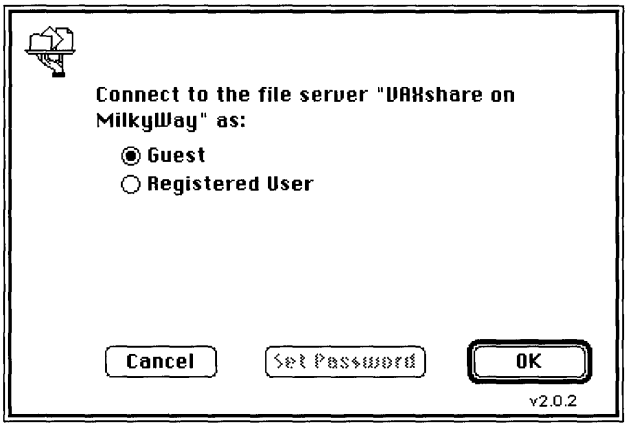


2 **Select a log-on method, and click the OK button. (Because you won't be using a password, it doesn't matter which method you select, unless you want to specify startup volumes.)**

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

VMS UAM does not allow you to specify startup volumes.

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.)

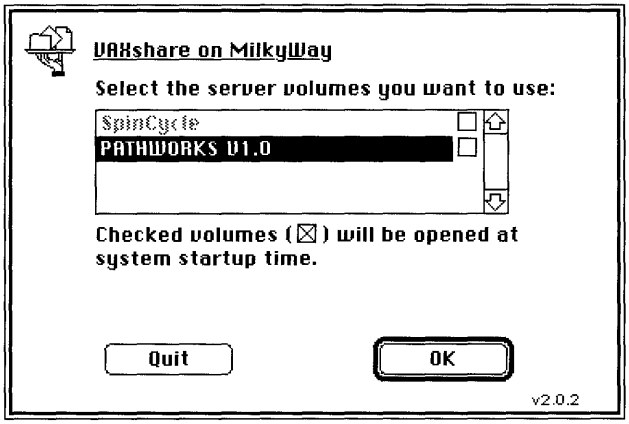


◆ **Note** If the Guest radio button is dimmed, you cannot log on as a guest. The system administrator can disable the guest log-on feature. ◆

3 Connect to the server.

Select Guest, and click the OK button.

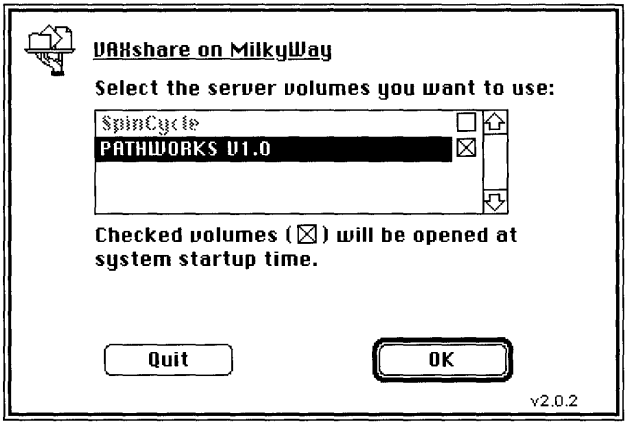
A dialog box appears, listing the server volumes available on the file server that you selected.



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.

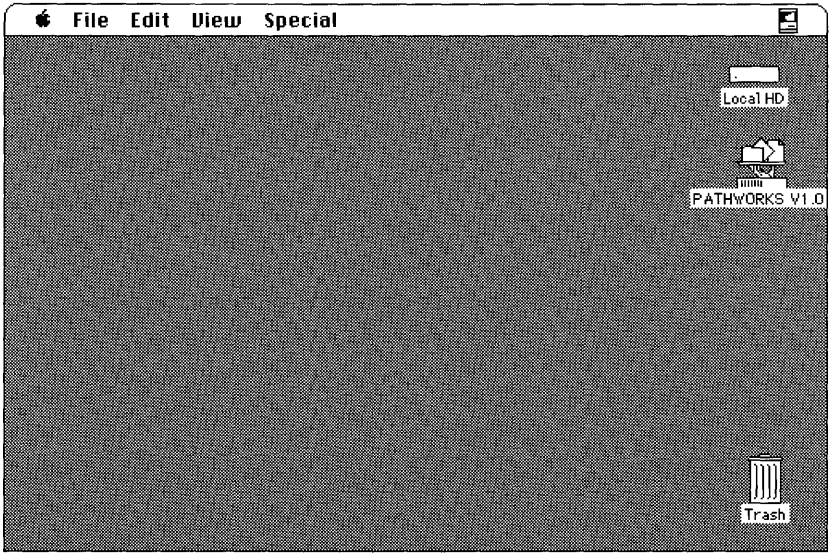
b. If your log-on method is Apple Standard, you can specify volumes to appear on your desktop automatically whenever you start your computer. Check the box (to the right of the volume name) for each volume that you want to appear.



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.

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.



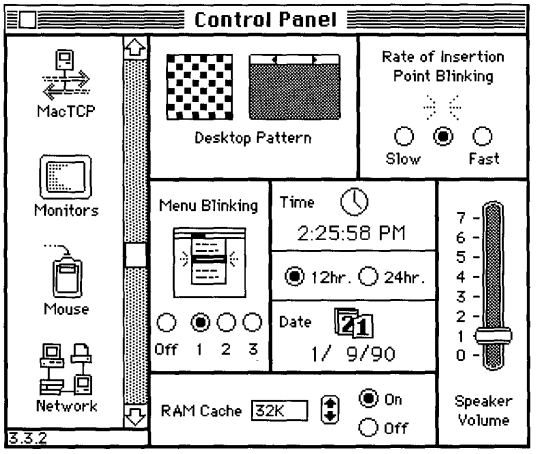
Selecting a network connection

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.

To select a network connection:

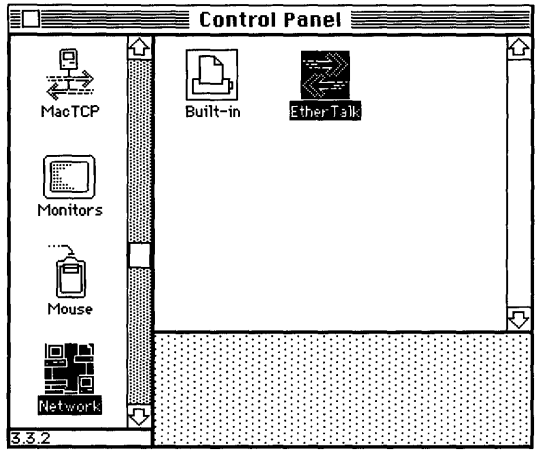
1 **Choose Control Panel from the Apple (🍎) menu.**

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 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 containing 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 applications) 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
- **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 for a folder

Once you have mounted a file-server volume, 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.

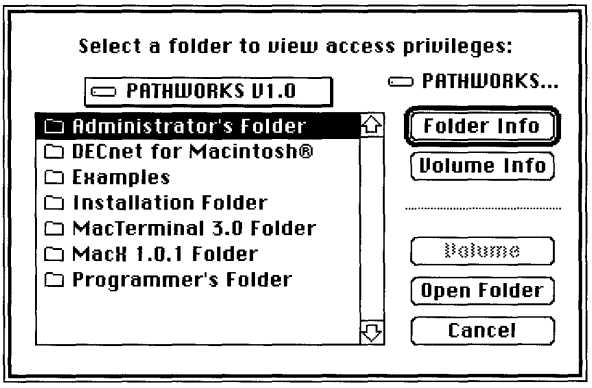
- The Access Privileges command, in the Apple (🍎) menu, is a desk accessory that you can use from an application when running under the Finder™. (This command is also known as the Access Privileges desk accessory.) You choose the Access Privileges command and then select a folder for which you want to 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 working under MultiFinder® or under the Finder. (If you are working under 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 working under MultiFinder, you must switch to the Finder in order 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.

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.**

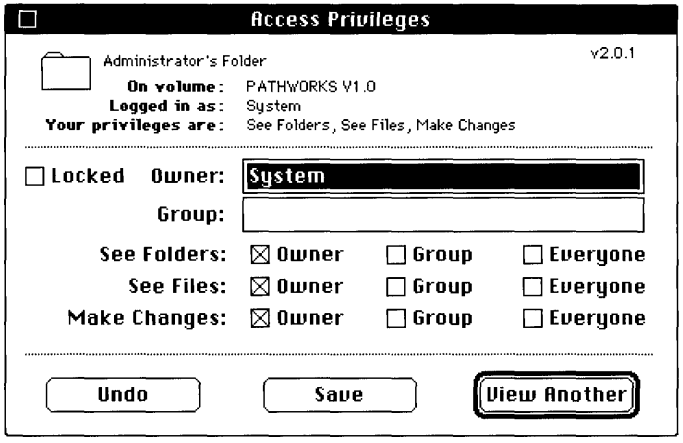
A dialog box appears, showing the contents of the file-server volume.



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 **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 check the Locked option, then the folder cannot be placed in the Trash, although individual items inside the folder can be thrown away.

5 **You can assign a group or change the group having access privileges to the folder by entering a group name in the Group text field.**

6 **Check the appropriate access privileges boxes, and click the Save button.**

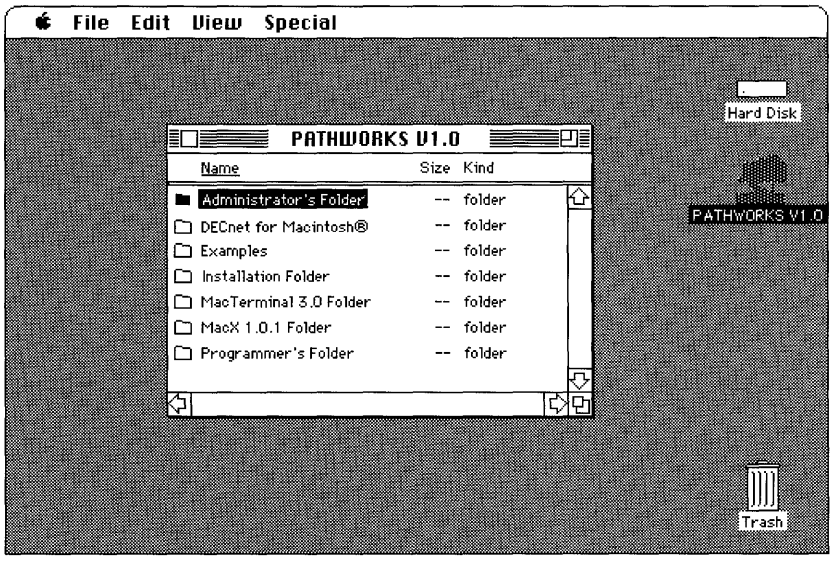
If you've made a mistake, you can cancel your changes by clicking the Undo button. Click the View Another button to set access privileges for another folder on the file server.

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.**

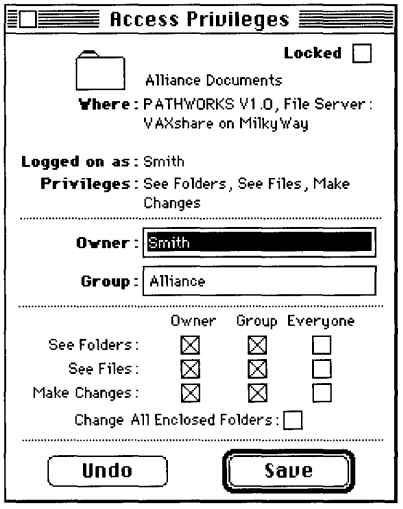
A window opens, displaying the volume's contents.

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 **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 check the Locked option, then the folder cannot be placed in the Trash, although individual items inside the folder can be thrown away.

5 **You can assign or change the group having access privileges to the folder by entering a group name in the Group text field.**

6 **Check the appropriate access privileges boxes.**

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

8 **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 applications.

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 log on to 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 applications. Others need to be converted to Macintosh formats before you can open them. You convert files by using the `CONVERT/DOCUMENT` CDL 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 application. For example, VMS text files can be opened by the TeachText application 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 applications 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 applications, such as documents created with the following applications:

- Microsoft Excel
- Adobe Illustrator
- MacPaint®

- MacWrite®
- MacDraw®
- PageMaker

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 applications.

◆ **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 applications 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. 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 application 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 application.

VMS command procedure (.COM) file
Type code: COM
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 applications that run on Macintosh computers.

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 applications.

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 applications 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 applications, 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.

Alternate log-on method

If you have installed the alternate 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.

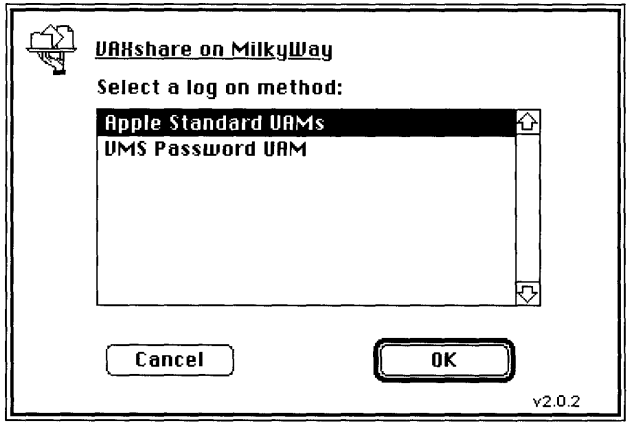


Figure 2-2 Choosing a log-on method

Figure 2-3 shows the dialog box that appears during the log-on process if you select the Apple Standard method; Figure 2-4 shows the box that appears if you select the VMS Password method.

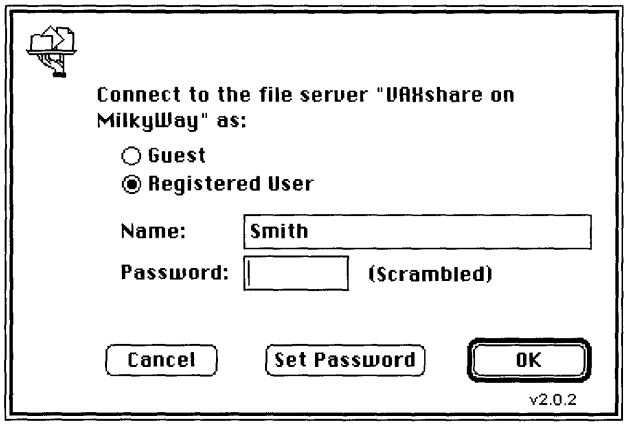


Figure 2-3 Apple Standard log-on method dialog box

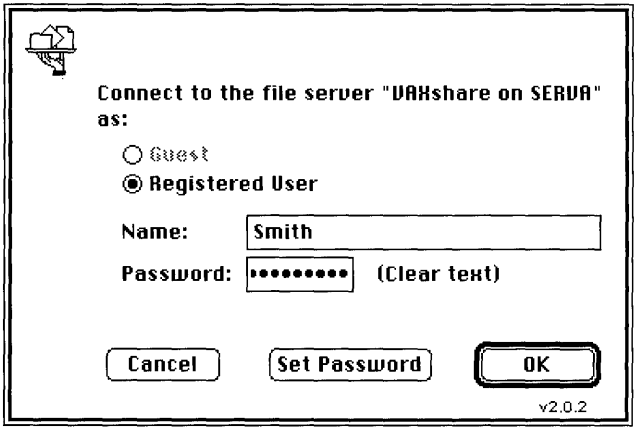


Figure 2-4 VMS UAM log-on method dialog box

Volume password

You may need to enter a password in order to log on to a particular volume. Figure 2-5 shows the dialog box that prompts you for a volume password.

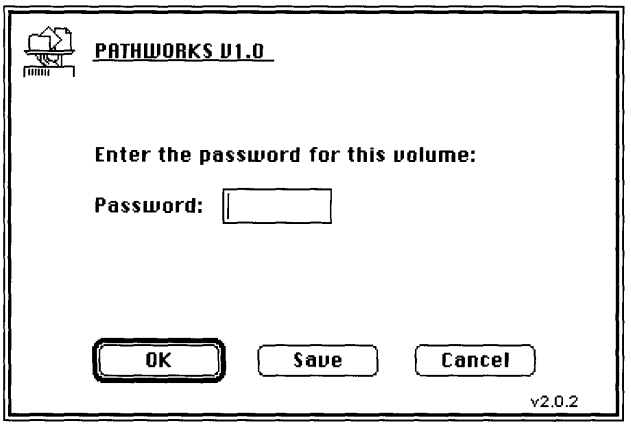


Figure 2-5 Entering a volume password

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 2-6.

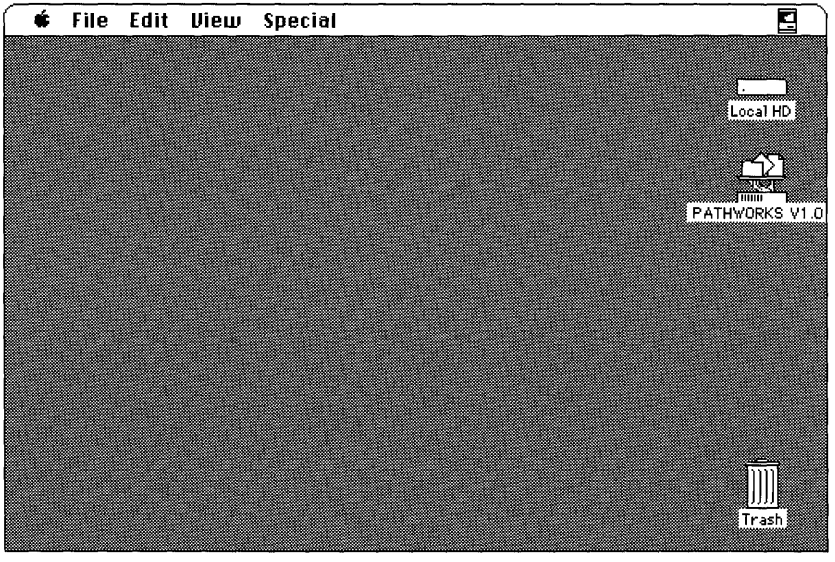


Figure 2-6 VAXshare file-server icon on desktop

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

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. 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.

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 VMS may have reached the limit set by the system administrator.

When you log on to a VAXshare file server, you are considered to be logged in to the VMS operating system, as well. The restrictions that apply to logging in to the operating system are thus relevant when you log on to VAXshare. 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.

Log-ins may have been temporarily disabled.

For example, the system administrator may be doing maintenance work on the VAX. The file server may be shutting down. 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 on to VAXshare at an appropriate time.

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

If one of the scenarios in the following list describes a problem that you're having, the problem 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 application from the *System Tools* disk (version 6.0.4 or a later version) 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 a later version. (The version number appears in the lower-left corner of the Control Panel). Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the Network icon in the Control Panel. You get a message 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, 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. 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 has become 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 applications 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 the suggestions later in this section for checking your network.
- If you switched the network connection in the Control Panel (as described earlier in this chapter) while the Connection Settings dialog box was open, 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.

You can't select devices connected to the printer port of your Macintosh.

If the Chooser does not let you select an ImageWriter® or other device connected to the printer port while the EtherTalk network connection is selected, you probably have an old version of the Chooser on your Macintosh. You must have Chooser version 3.4 (or a later version) to select a device on the printer port. Use the Installer application from *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically updates the Chooser.

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 application may be helpful.

- Is your Ethernet card installed and set correctly?

  Shut down your Macintosh 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?

  You may have more than one network to which you can connect. Use the Control Panel to select the proper network connection. See "Selecting a Network Connection" earlier in this chapter for instructions.

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 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 application and saves a print file on the disk. VAXshare then returns printer codes to your application to signal that printing has been completed. It appears to your application 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

- PrintServer 20 (LPS20)
- PrintServer 40™ (LPS40)
- PrintServer 40 Plus (LPS40 Plus)
- Script Printer (LN03R™)

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 VAX users access LaserWriter printers. ◆

The terms *print server* and *print spooler* usually mean the same thing—an application 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 working with MultiFinder, 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. For information on installing these components, see 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.

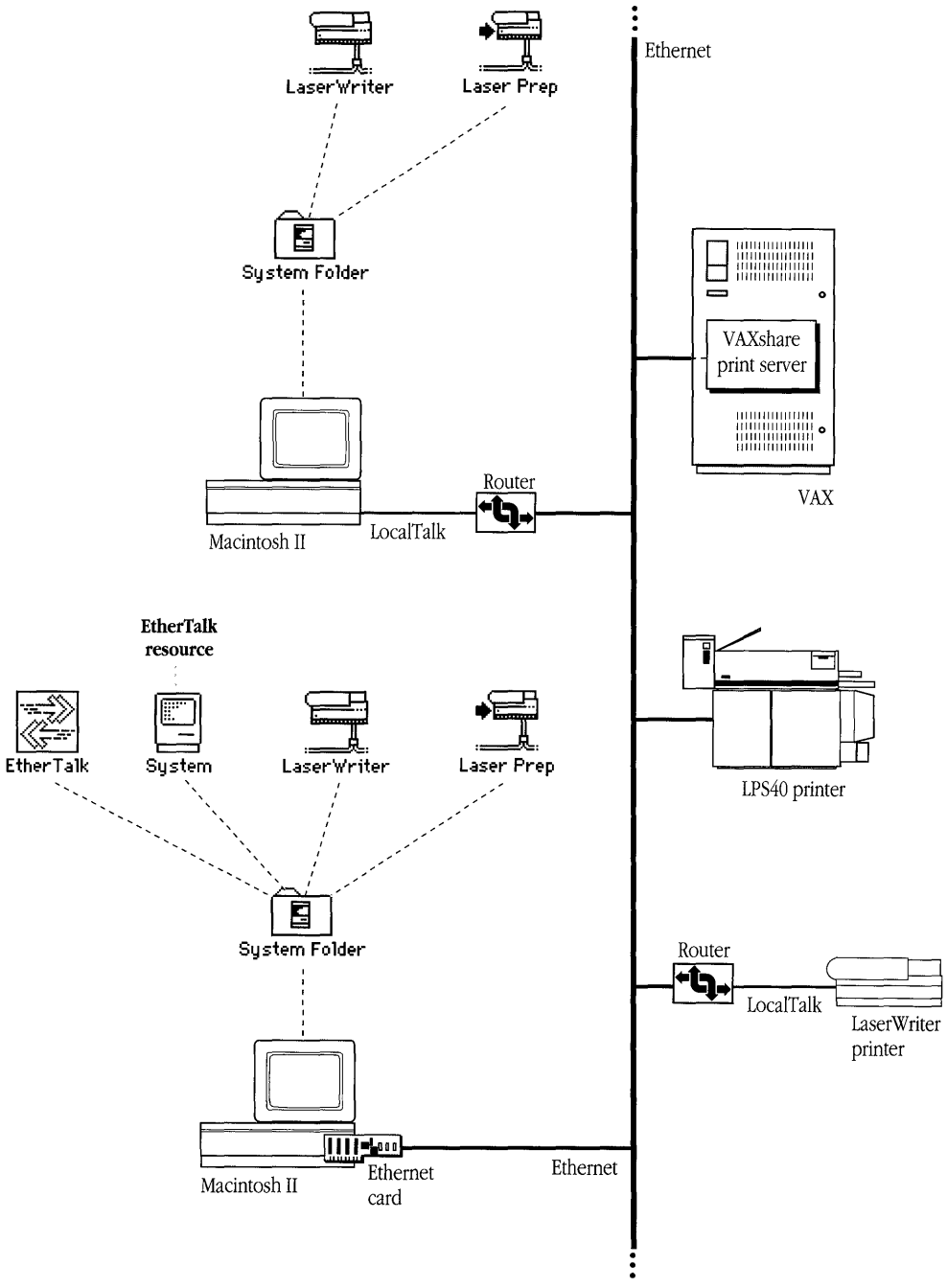


Figure 3-1 Network components for VAXshare print services

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 only way to tell printers from servers is by name. 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.

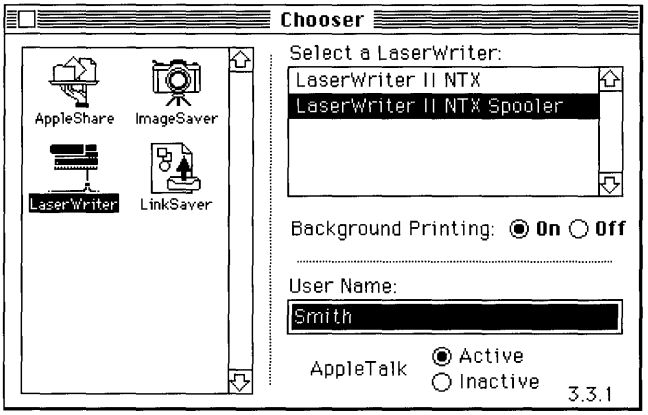


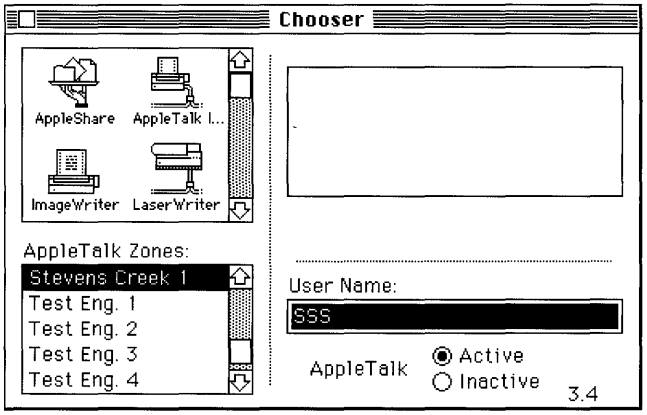
Figure 3-2 Chooser showing list of printers and print servers

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 can select a server.

To select a server:

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

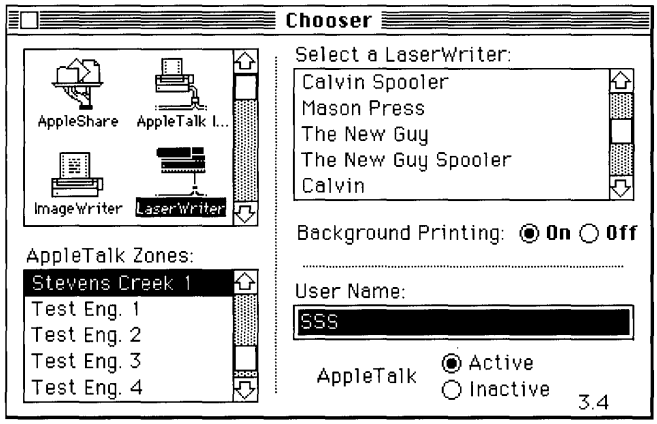
The Chooser window appears.



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.**

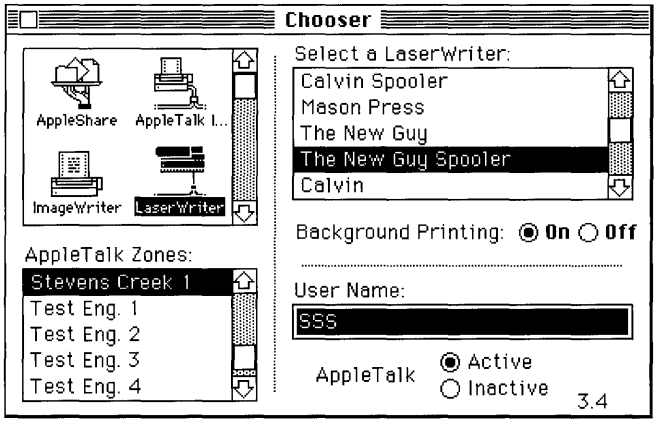
3 **If your network is divided into zones, the available zones are listed in the lower-left corner of the window. Select the zone containing the print server that you want to use.**

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.

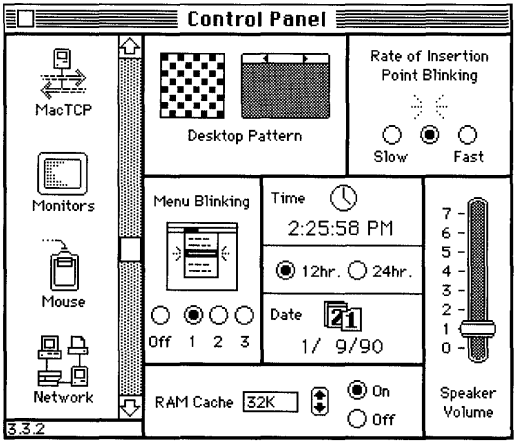
Selecting a network connection

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.

To select a network connection:

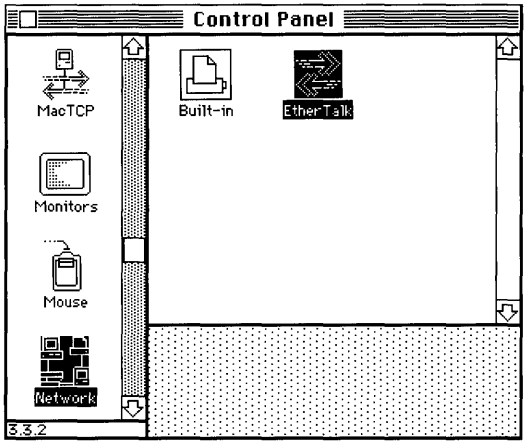
1 **Choose Control Panel from the Apple (🍎) menu.**

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 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 containing 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 four paper trays, it could have two more device queues associated with it—one for each of the remaining paper trays.)

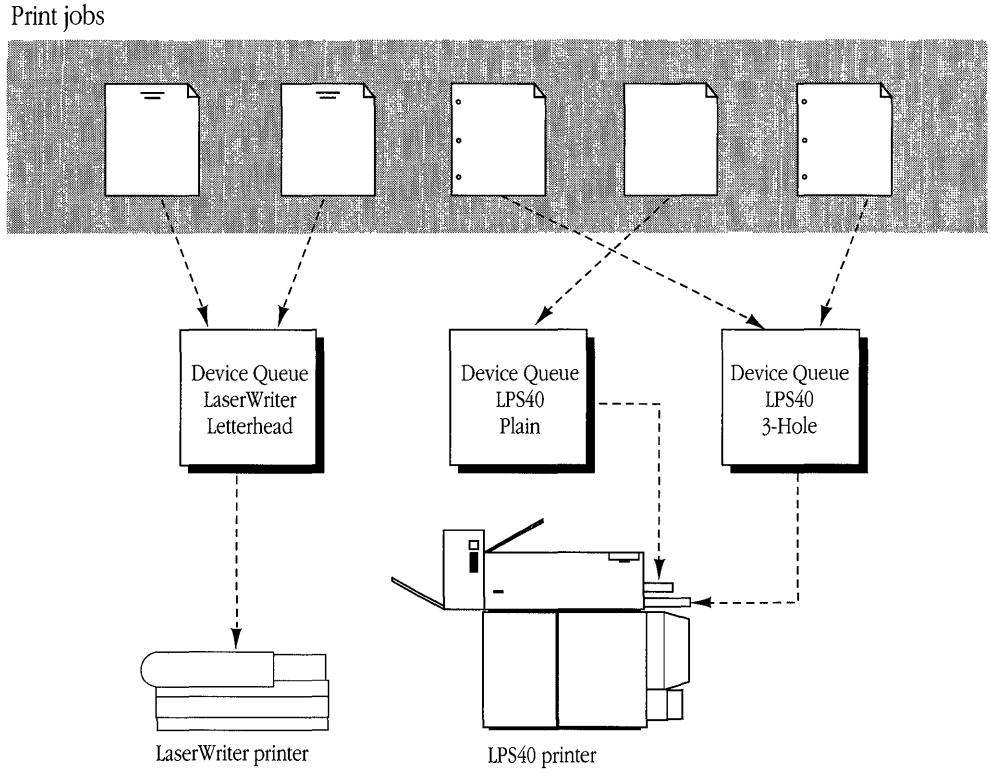


Figure 3-3 Device print queue

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.

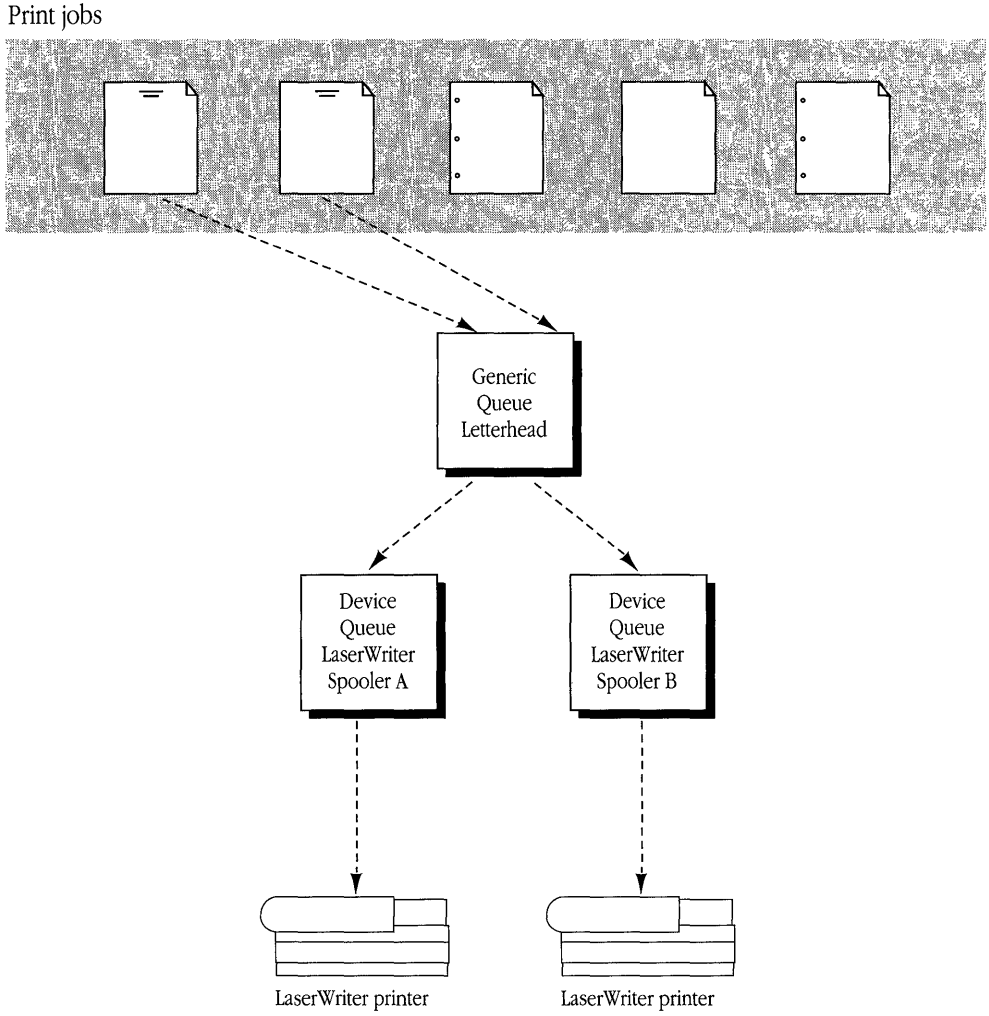


Figure 3-4 Generic print queue

◆ **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

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 application 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

If one of the scenarios in the following list describes a problem that you're having, the problem 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 application from the *System Tools* disk (version 6.0.4 or a later version) 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 a later version. (The version number appears in the lower-left corner of the Control Panel). Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the Network icon in the Control Panel. You get a message 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, 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. 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 has become 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 applications 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 the suggestions later in this section for checking your network.
- If you switched the network connection in the Control Panel (as described earlier in this chapter) while the Connection Settings dialog box was open, 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.

You can't select devices connected to the printer port of your Macintosh.

If the Chooser does not let you select an ImageWriter or other device connected to the printer port while the EtherTalk network connection is selected, you probably have an old version of the Chooser on your Macintosh. You must have Chooser version 3.4 (or a

later version) to select a device on the printer port. Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically updates the Chooser.

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 application may be helpful.

- Is your Ethernet card installed and set correctly?

  Shut down your Macintosh 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?

  You may have more than one network to which you can connect. Use the Control Panel to select the proper network connection. See "Selecting a Network Connection" earlier in this chapter for instructions.

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, a communications application supplied with PATHWORKS for Macintosh, enables your Macintosh computer 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 applications. 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 application.

For detailed information about MacTerminal, including an explanation of each item in MacTerminal's menus, see the *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 applications

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

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 applications 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—for example, so that you can type `home` rather than `set default system`—and write small programs, called *command procedures,* that carry out commonly used series of commands.
- Get information about the system.
- Work with disks, magnetic tape drives, and other devices.

As discussed in Chapter 1, you can connect your Macintosh to a VAX computer in several different ways. Figure 4-1 shows two ways to make the physical connection to a VAX through a computer network. 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. Because this guide is about network services, this chapter concentrates on network connections. For information on the other kinds of connections, see "Modem and Serial Connections," later in this chapter.

Figure 4-1 also shows the software components involved in using network-based terminal services. For instructions on installing software components, see the *Installation* part of this guide.

◆ **Note** If the symbols and terminology shown in Figure 4-1 are unfamiliar to you, you may want to read Appendix A, which discusses network terms and concepts. ◆

MacTerminal and the communications tools

MacTerminal is a communications application 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 application, 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 *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. Examples: VT102 Terminal Emulation Tool, VT320 Terminal Emulation Tool.
- **Connection tools,** which define the type of connection that is established between your Macintosh and the VAX computer or Digital network. Examples: LAT Connection Tool, Serial Connection Tool, Apple Modem Connection Tool.

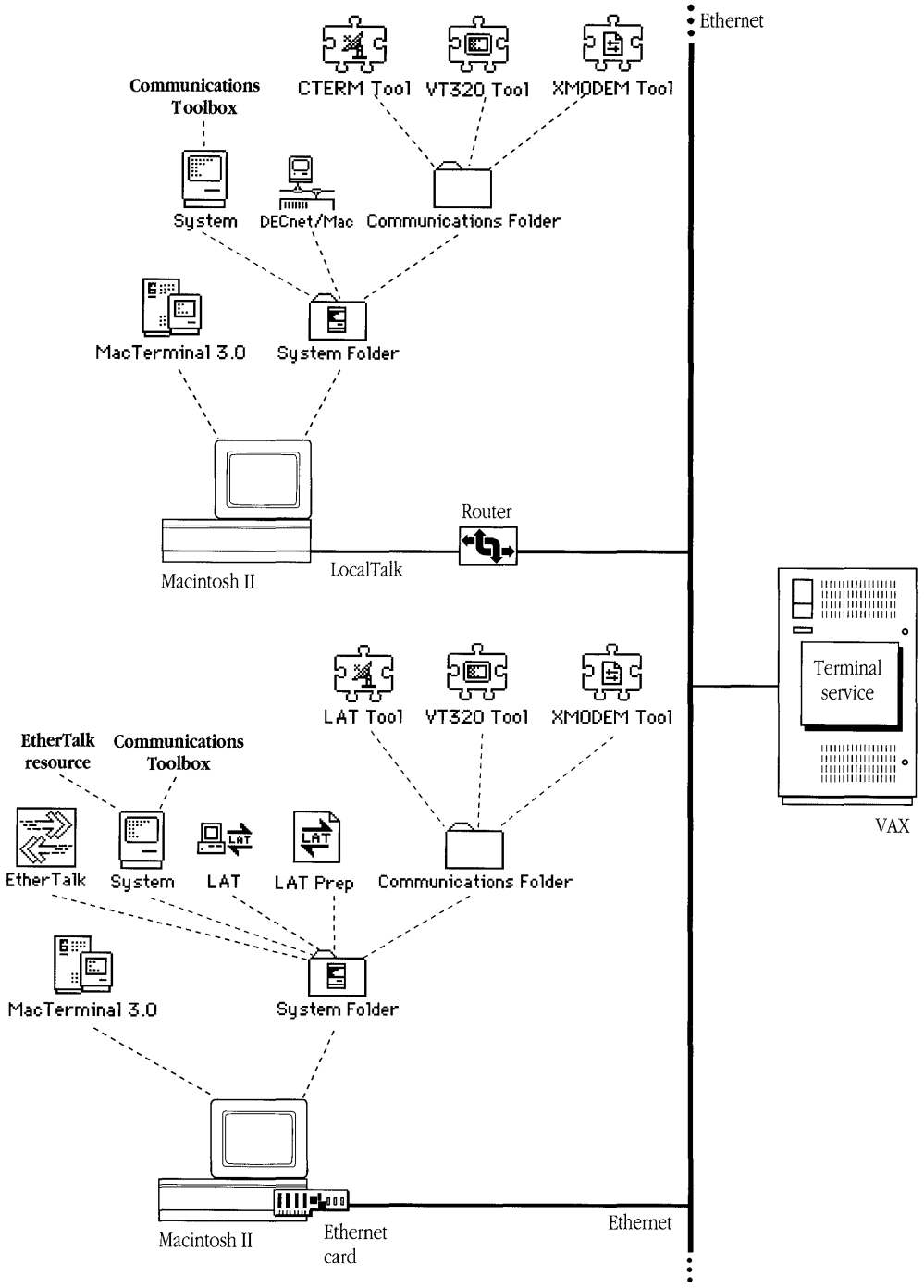


Figure 4-1 Network components for using terminal services

- **File-transfer tools,** which ensure that files are transferred intact between your Macintosh and the VAX computer or Digital network. Examples: Text File Transfer Tool, 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 MacTerminal 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 application. 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 *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 *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 four connection tools that can be used with MacTerminal to access terminal services:

- LAT Connection Tool
- Apple Modem Connection Tool

- Serial Connection Tool
- AppleTalk ADSP Connection Tool

Although other factors may influence your decision, your choice of connection tool depends primarily on the physical connection between your Macintosh and the VAX hosting the terminal services that you want to use. The AppleTalk ADSP and LAT 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 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 Tool *does not* work over a router. Thus, if your Macintosh is connected to Ethernet through LocalTalk and a router, you must choose some other type of connection tool. (Figure 4-1, near the beginning of this chapter, shows the two types of network connections.)

◆ **CTERM connections** The CTERM Connection Tool *can* work over LocalTalk networks and routers. If you have the CTERM Tool installed in your Communications Folder and the DECnet/Mac driver installed in your System Folder, then you can access terminal services through your LocalTalk connection to Ethernet. ◆

"Connecting to a VAX on the Network," later in this chapter, tells how to use a session document configured with the LAT 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 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 *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 common 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 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 *Connection Tools* part of the *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 *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 a sample session document that provides LAT connections to VAX computers. The VAX LAT Connection session document is preconfigured with the following tools:

- LAT Connection Tool
- VT320 Terminal Emulation Tool
- Text File Transfer Tool

This section describes how to use the VAX LAT Connection session document to establish a LAT connection to VAX terminal services.

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."

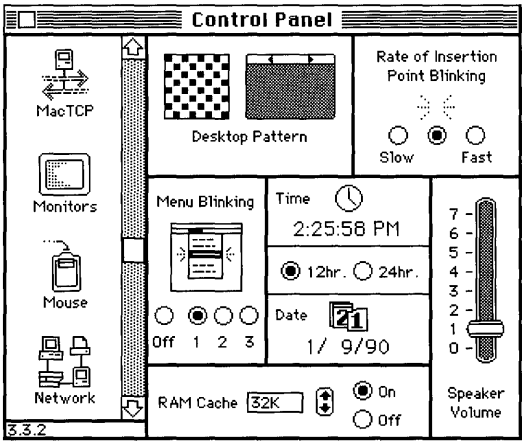
Selecting a network connection

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.

To select a network connection:

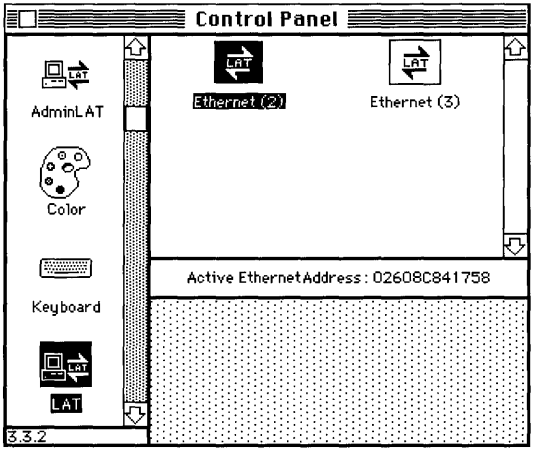
1 **Choose Control Panel from the Apple (🍎) menu.**

The Control Panel dialog box appears.



2 Select the LAT 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 LAT 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 is connected. A connection to an Ethernet environment is represented by an icon labeled "Ethernet." 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 containing the Ethernet card for that connection.

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

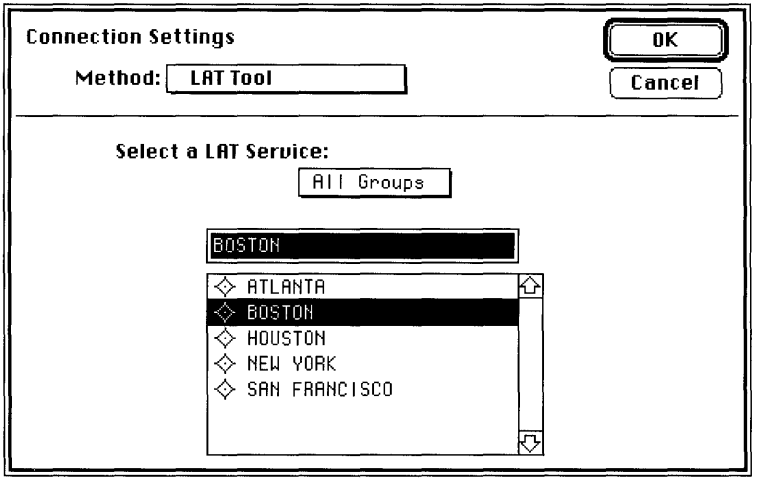
Using the VAX LAT Connection session document

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

To select and connect to a LAT terminal service:

1 **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.



2 **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. If your system administrator has created groups of services, you may also need to select a group from the pop-up menu near the center of the dialog box.

3 **Click the OK button.**

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

4 **Save your session document.**

What you need to do next depends on the type of terminal service you've selected. If you selected a user account on a VAX, 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,* 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, such as a connection from a LAT session document as described in the preceding section. (See "Modem and Serial Connections," later in this chapter, for information about connecting to a VAX if you are not on a network.)

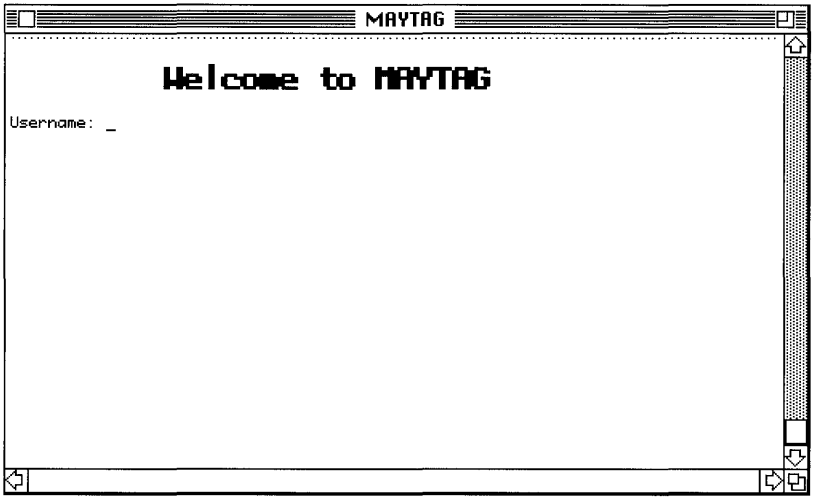
To log in from a LAT session document:

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

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

The welcome message from the VAX 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

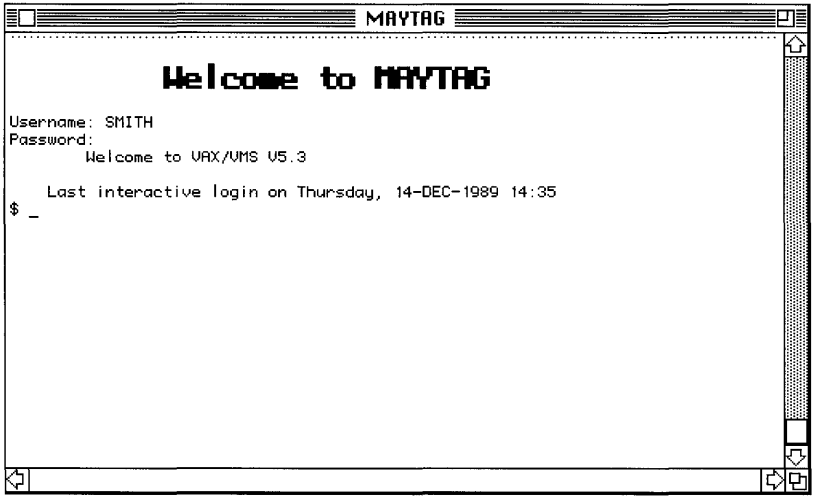
the *timeout period.* If there is no activity at your end, and the VAX disconnects you, the VAX is said to have *timed out.*)



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.

Figure 4-2 shows the sequence of commands and responses for changing the VMS account password.

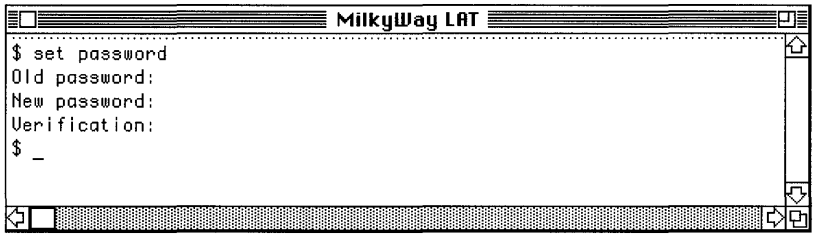


Figure 4-2 Changing your VMS password

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. Figure 4-3 shows an example of a VMS directory list.

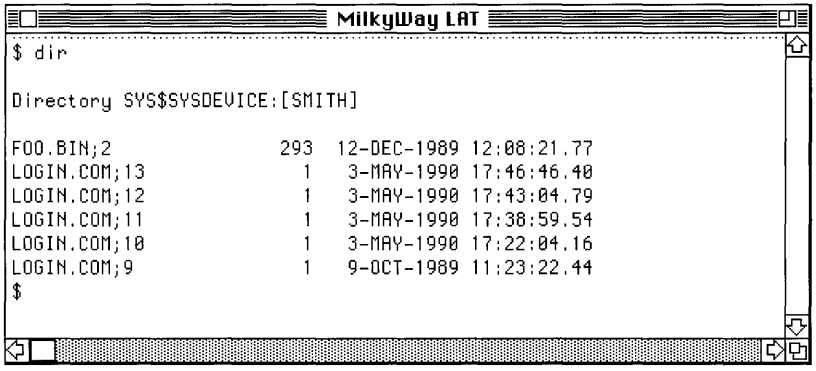


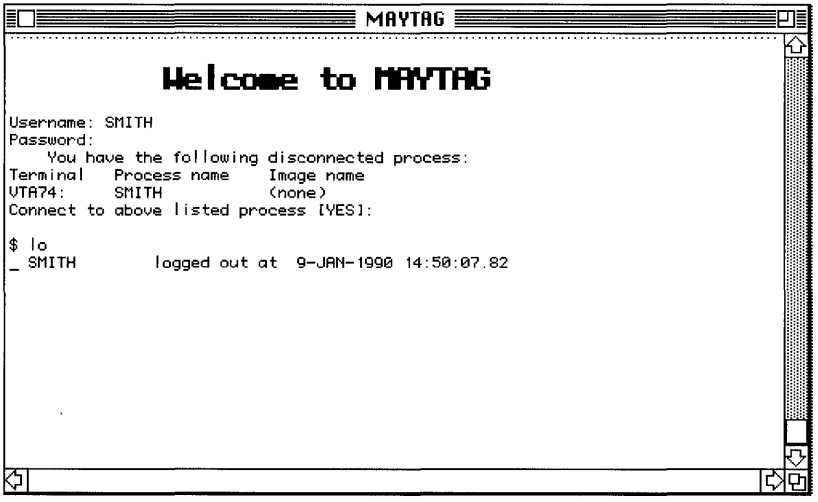
Figure 4-3 A list of the files in a VMS directory

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 applications

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

To access a terminal service application, 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 application. 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 applications. 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 *MacTerminal User's Guide* binder.) When the LAT Tool presents the list of available services, specify the terminal service application 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 is connected to an Ethernet environment through an Ethernet card. If your Macintosh connection to Ethernet is through a LocalTalk network, the LAT Tool will not work—you'll need to use the 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 applications.

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 application should run automatically. The application may or may not request your user name, password, or both. For information about using the application, refer to the documentation for that application.

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.

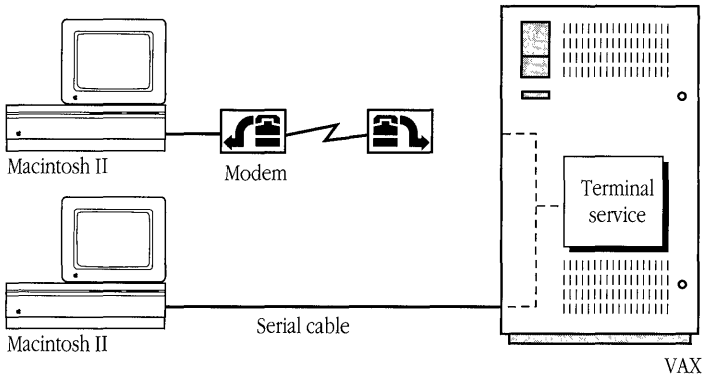


Figure 4-4 Modem and serial connections to a VAX computer

◆ **Note** If the symbols and terminology shown in Figure 4-4 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 *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 application, 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 *MacTerminal User's Guide*.

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 application) 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.

You are using a serial connection or a modem to communicate with the VAX, 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. The setting for the VAX 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.

The LAT driver doesn't seem to be installed.

Check to 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.

The LAT driver must also be installed in the System Folder on your hard disk. If it is not, reinstall the LAT Tool.

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've connected to the right network. First verify that your Macintosh contains a properly installed Ethernet card. If your Macintosh contains more than one Ethernet card, open the Control Panel and select the LAT icon to see which Ethernet card is selected. Choose the network that has the service you want to use.

A 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've connected to the right network. Open the Control Panel and select the LAT icon to see which Ethernet card is selected.

Because the Connection Settings dialog box can only list 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.

Check to make sure that you've connected to the right network. First verify that your Macintosh contains a properly installed Ethernet card. If your Macintosh contains more than one Ethernet card, open the Control Panel and select the LAT icon 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.

◆ **Note** In some Ethernet environments, identical services may be offered by more than one VAX computer. The LAT Tool software does not let you specify a service on a particular VAX. The load-balancing feature of the LAT protocol chooses the service to which you'll be connected. That choice depends on the demands for the VAX resources on which the services reside. ◆

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 or receive 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 *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

If one of the scenarios in the following list describes a problem that you're having, the problem 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 application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

The MacTCP 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 MacTCP icon has been removed from your System Folder. You must reinstall the MacTCP software. See the *Installation* part of the *Network Services User's Guide* binder.
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or a later version. (The version number appears in the lower-left corner of the Control Panel). Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the MacTCP icon in the Control Panel. You get a message 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.

Neither the EtherTalk icon nor the Ethernet icon appears in the Control Panel after you click the MacTCP 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 file has been removed 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, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk or Ethernet icons appear in the Control Panel when you click the MacTCP 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 or Ethernet icon in the Control 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 has become 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 or Ethernet 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 applications 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 or Ethernet 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 the suggestions later in this section for checking your network.
- If you switched the network connection in the Control Panel (as described earlier in this chapter) while the Connection Settings dialog box was open, 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.

You can't select devices connected to the printer port of your Macintosh.

If the Chooser does not let you select an ImageWriter or other device connected to the printer port while the EtherTalk network connection is selected, you probably have an old version of the Chooser on your Macintosh. You must have Chooser version 3.4 (or a later version) to select a device on the printer port. Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically updates the Chooser.

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 application may be helpful.

- Is your Ethernet card installed and set correctly?

  Shut down your Macintosh 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?

  You may have more than one network to which you can connect. Use the Control Panel to select the proper network connection. See "Selecting a Network Connection" earlier in this chapter for instructions.

5 MacX and DECwindows Applications

This chapter introduces MacX, a component of PATHWORKS for Macintosh that lets you access DECwindows applications running on VAX computers. MacX 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 applications by using the **AppleTalk-DECnet Connection Tool.** For detailed information on the X Window System and MacX, read the *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

MacX is Apple Computer's implementation for the Macintosh computer of the X Window System. 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 Massachussetts 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 people 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 *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 MacX, 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 applications.* DECwindows is Digital Equipment Corporation's implementation for VAX computers of the X Window System. DECwindows runs under both the VMS and the **ULTRIX**™ operating systems.

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

- 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 *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-Digital network—including the MacX server, MacX support files, communications tools, and DECwindows applications (clients). In this example network, the AppleTalk-DECnet Connection Tool is used to create the connection between the Macintosh computer and the Digital network. (For instructions on instal-ling PATHWORKS for Macintosh components, see 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. ◆

Using windows

MacX displays each DECwindows application 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.

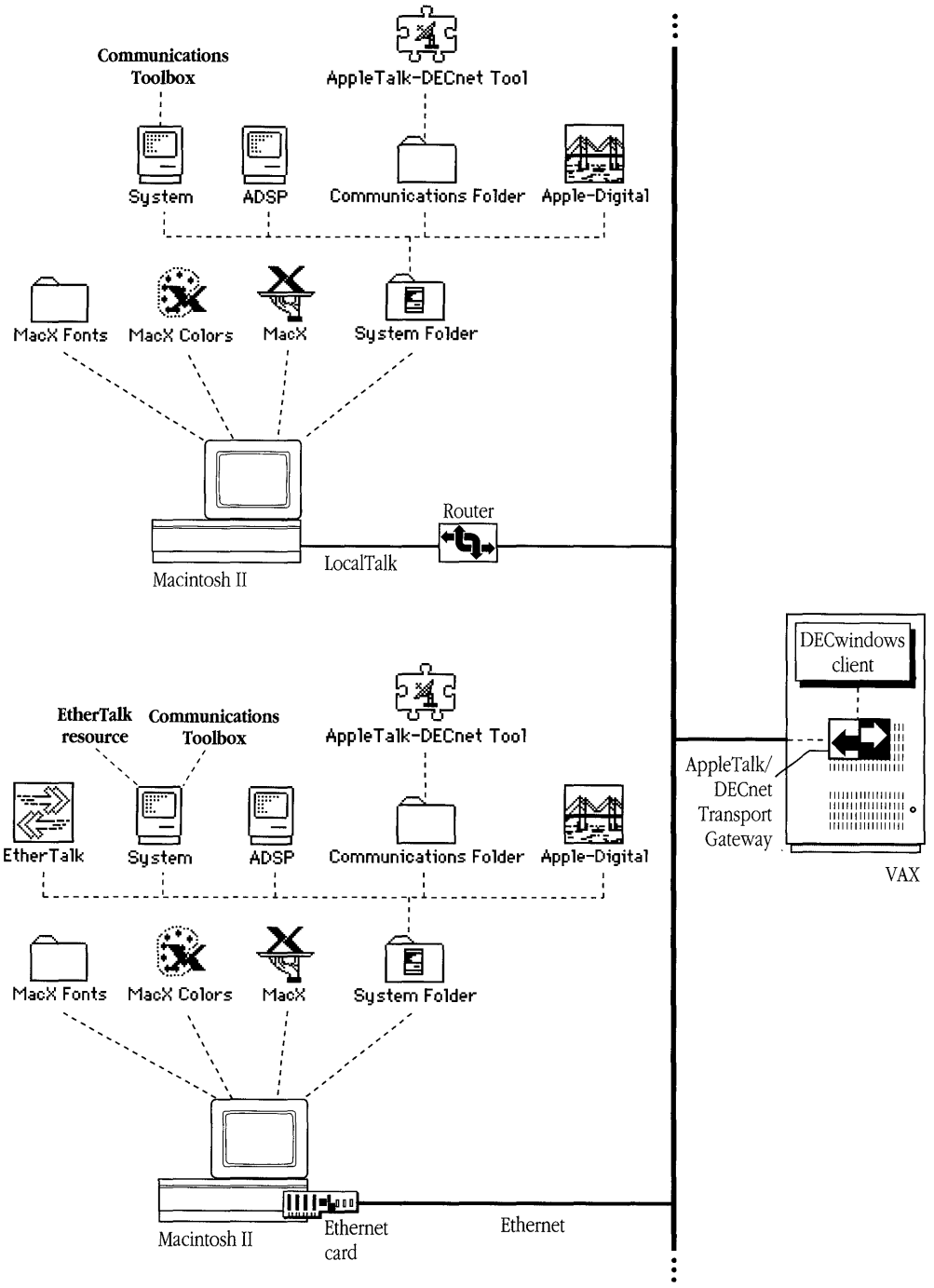


Figure 5-1 Network components of a MacX environment

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 *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.

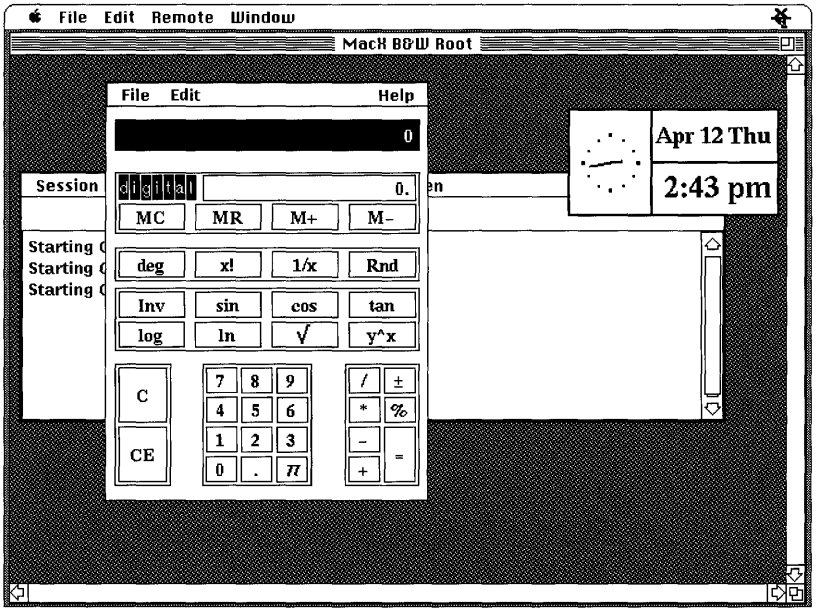


Figure 5-2 MacX windows in rooted style

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.

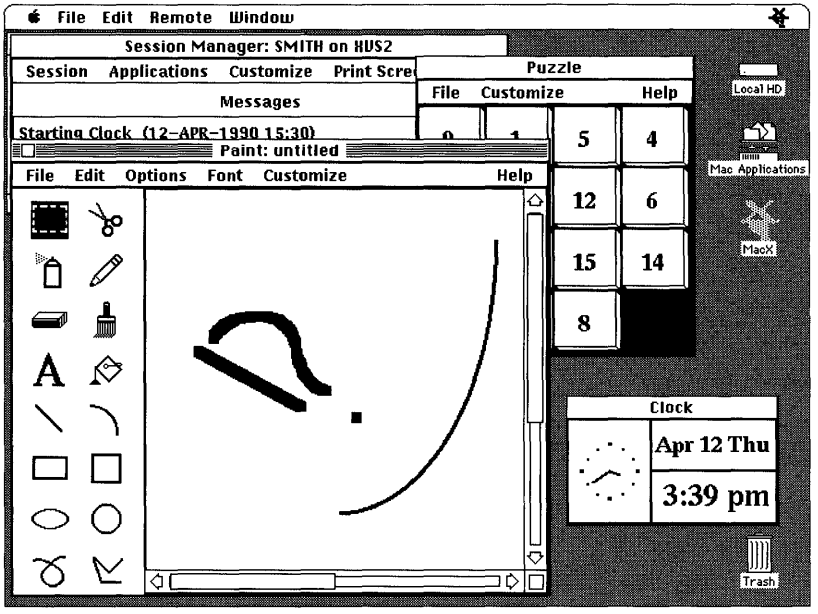


Figure 5-3 MacX windows in rootless style

For each DECwindows application 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 application, 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 applications 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 applications. (If your Macintosh 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 application 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 applications.

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 will prompt 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 applications. 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 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 *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 MacX, double-click the MacX application 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 *MacX User's Guide.*)

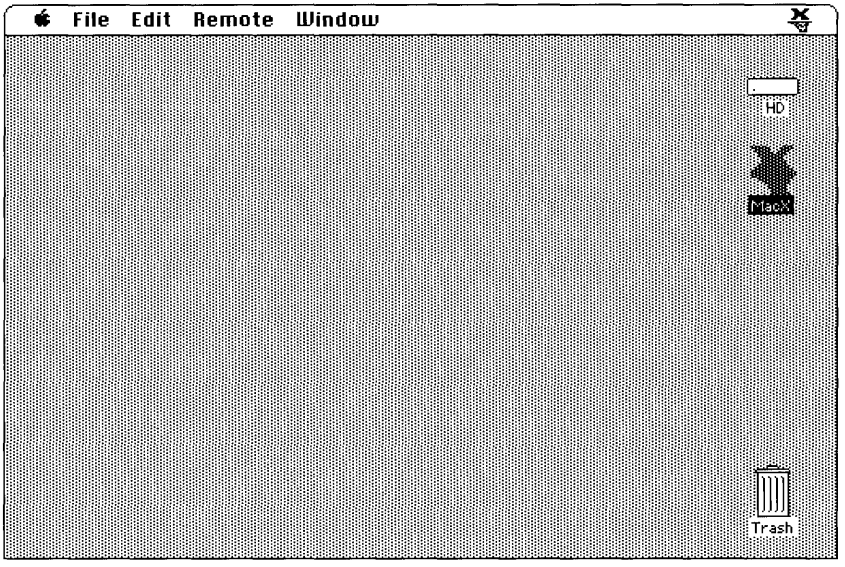


Figure 5-4 The MacX desktop

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 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 "Selecting a Gateway."

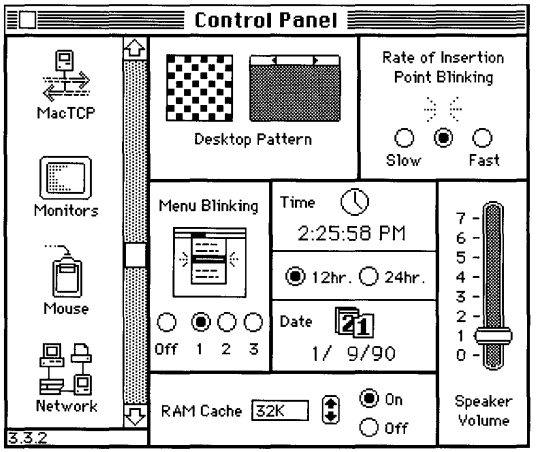
Selecting a network connection

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.

To select a network connection:

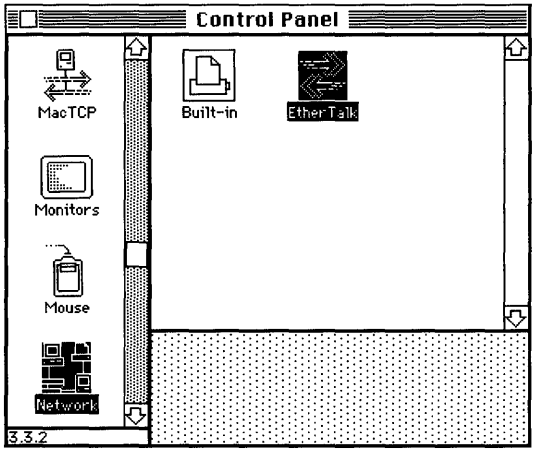
1 **Choose Control Panel from the Apple (🍎) menu.**

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 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 containing the Ethernet card for that connection.

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

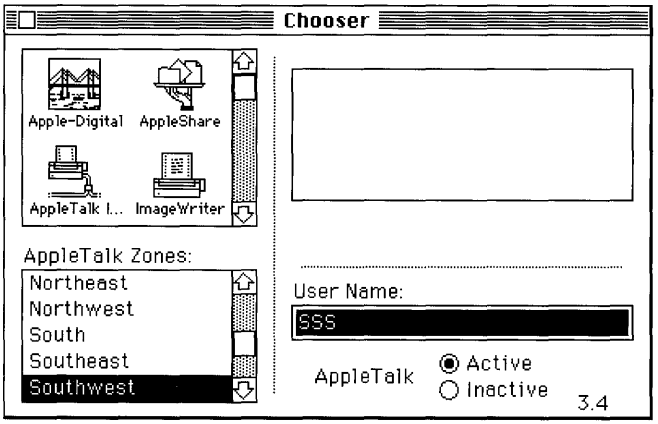
Selecting a gateway

Follow these steps to select a gateway from the Chooser. The Macintosh Operating System remembers your gateway selection for future sessions. After you've selected a gateway once, you only need to repeat this procedure if you want to select a different gateway.

To select a gateway:

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

The Chooser window appears.

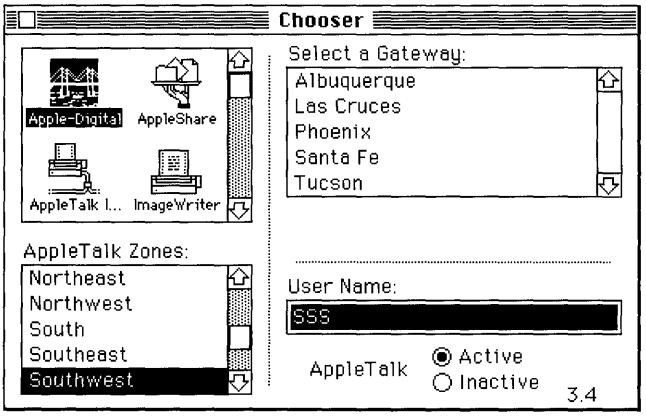


2 **Make sure that your Macintosh is physically connected to the network, and select the Active option for AppleTalk, in the lower-right corner of the window.**

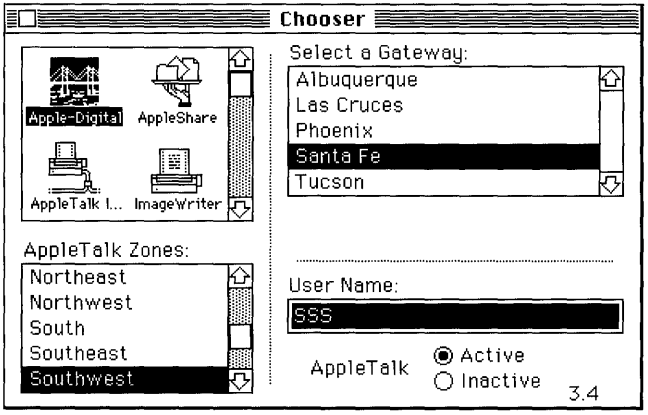
3 **If your network is divided into zones, select the zone that contains the gateway that you want to use.**

The list of available zones appears in the lower-left corner of the window.

4 **Select the Apple-Digital icon from the group of icons in the upper-left corner of the Chooser window.**



5 **Select the gateway that you want to use from the list in the upper-right corner of the window.**



6 **Close the Chooser window.**

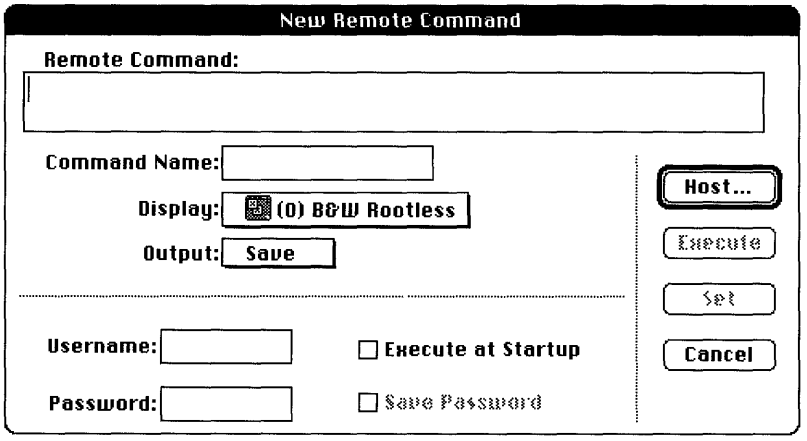
Starting the Session Manager

This section tells you how to create a remote command to start the DECwindows Session Manager through an AppleTalk-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:

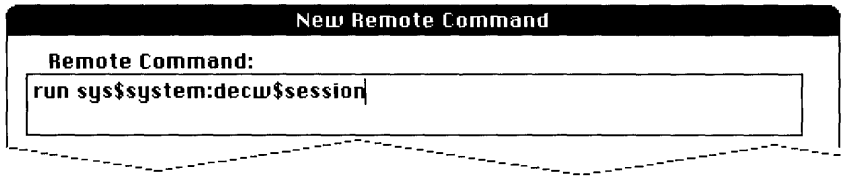
1 **Choose New Command from the Remote menu or press Command-R.**

The New Remote Command dialog box appears.



2 **Enter the command to start the Session Manager.**

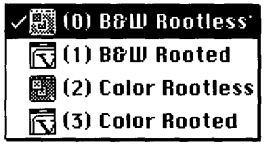
Type the command `run sys$system:decw$session` in the Remote Command field.



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 *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 option, the Macintosh computer beeps and a small, flashing MacX icon appears at the left end of the menu bar when MacX receives output from the host. See Chapter 3 in the *MacX User's Guide* for an explanation of the other output options.

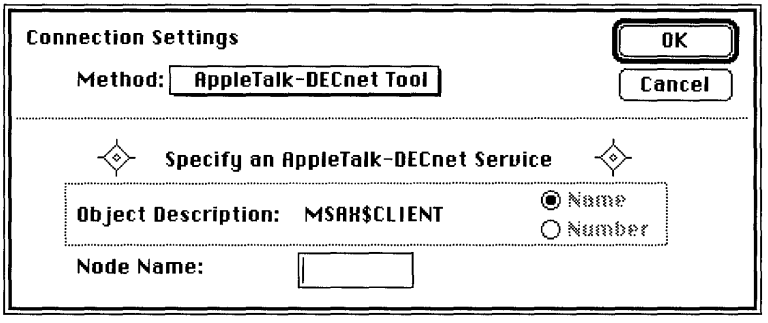
Username: Enter the user name assigned to you by your system administrator.

Password: Enter the password assigned to you by your system administrator. Each character that you type appears as a dimmed, gray box for security purposes.

Execute at Startup: Check 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 check box should be dimmed. If it is not, leave it unchecked for now. For more information, see Chapter 3 in the *MacX User's Guide*.

Host: Click the Host button to display the Connection Settings dialog box. 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 applications. The preset connection method, AppleTalk-DECnet Tool, is displayed. (If you select a different connection tool, the lower part of the Connection Settings dialog box will change. Each connection tool has a different set of options for you to configure.)



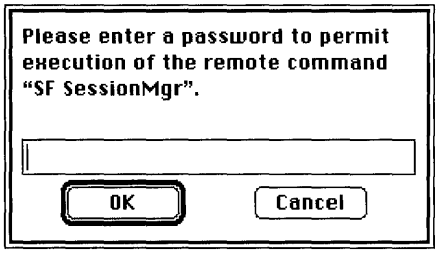
In the Node Name field, enter the node name of the VAX running the DECwindows applications that you want to use. Ask your system administrator for the node name if you don't know it.

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.

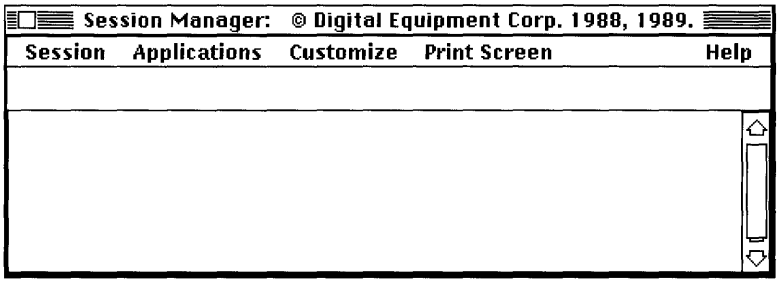


After a brief pause, MacX may display the alert box shown in the next figure. If this optional security measure is active, the alert appears in response to any attempt to connect with your MacX server. It prevents others from surreptitiously accessing MacX from another terminal without your knowledge 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 application 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 things 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 *MacX User's Guide* if you need more help.

Running DECwindows applications

You can always start an application 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 application 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 chosen.

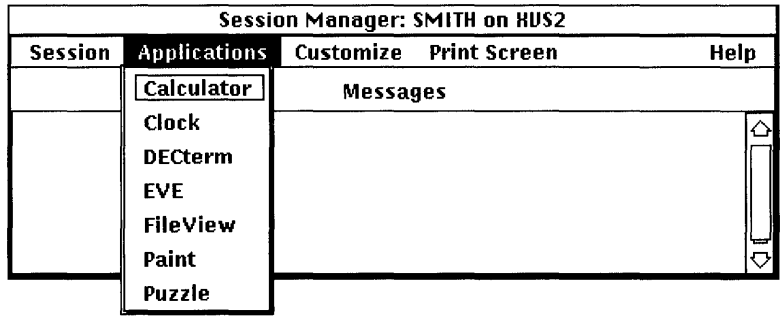


Figure 5-5 Starting an application from the Session Manager

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 applications 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, and other parts of your DECwindows environment.

You can also start applications from the DECterm terminal emulator. See the *MacX User's Guide.*

Quitting DECwindows applications

All DECwindows applications have a Quit or Exit command available from one of their menus, usually the File menu. You should always close a DECwindows application 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 *MacX User's Guide.*

Quitting MacX

This section gives the procedure for quitting the MacX application.

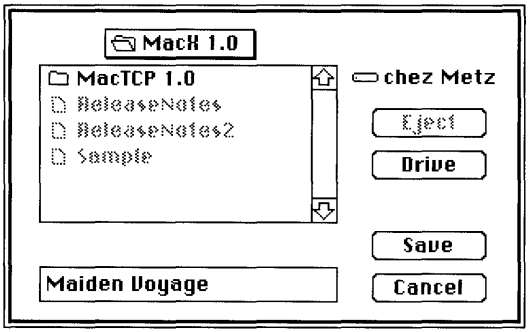
To quit MacX:

1 **Quit the DECwindows applications 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.



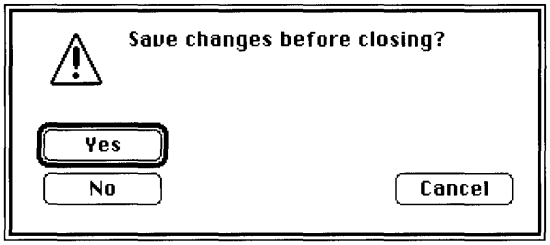
As discussed earlier in this chapter, MacX has created a settings document to preserve your remote command and the rest of your X environment. Unless you save the settings document, MacX will discard your settings information.

3 **Name your settings document.**

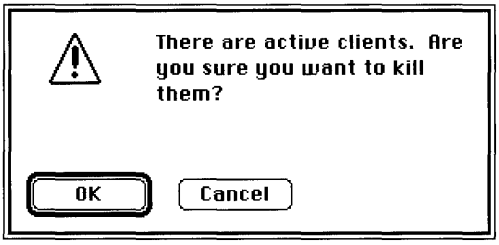
The document is currently labeled *Untitled*. Enter another name in the highlighted field and either press the Return key or click the Save button. (The preceding figure shows the name *Maiden Voyage* entered in this field.) MacX creates a document icon labeled with the name that you entered. Later, 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 applications 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 applications 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 specified for the X Window System.

Mouse differences

Mouse devices designed by Digital have three buttons, whereas the Macintosh mouse has one. DECwindows applications 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.

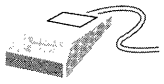
Macintosh mouse button or key	MacX function
	Left mouse button
	Middle mouse button
	Right mouse button
	Alt (meta modifier)
	Control key

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.

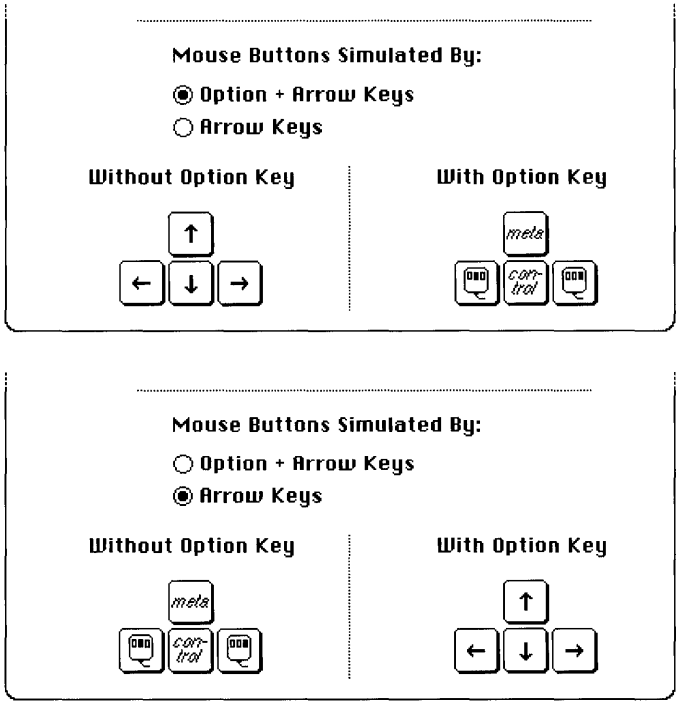


Figure 5-7 The arrow keys preference option

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).

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 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 shows 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 cabling. The thinnest lines denote LocalTalk cables. The labels next to the lines designate 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. In order 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.

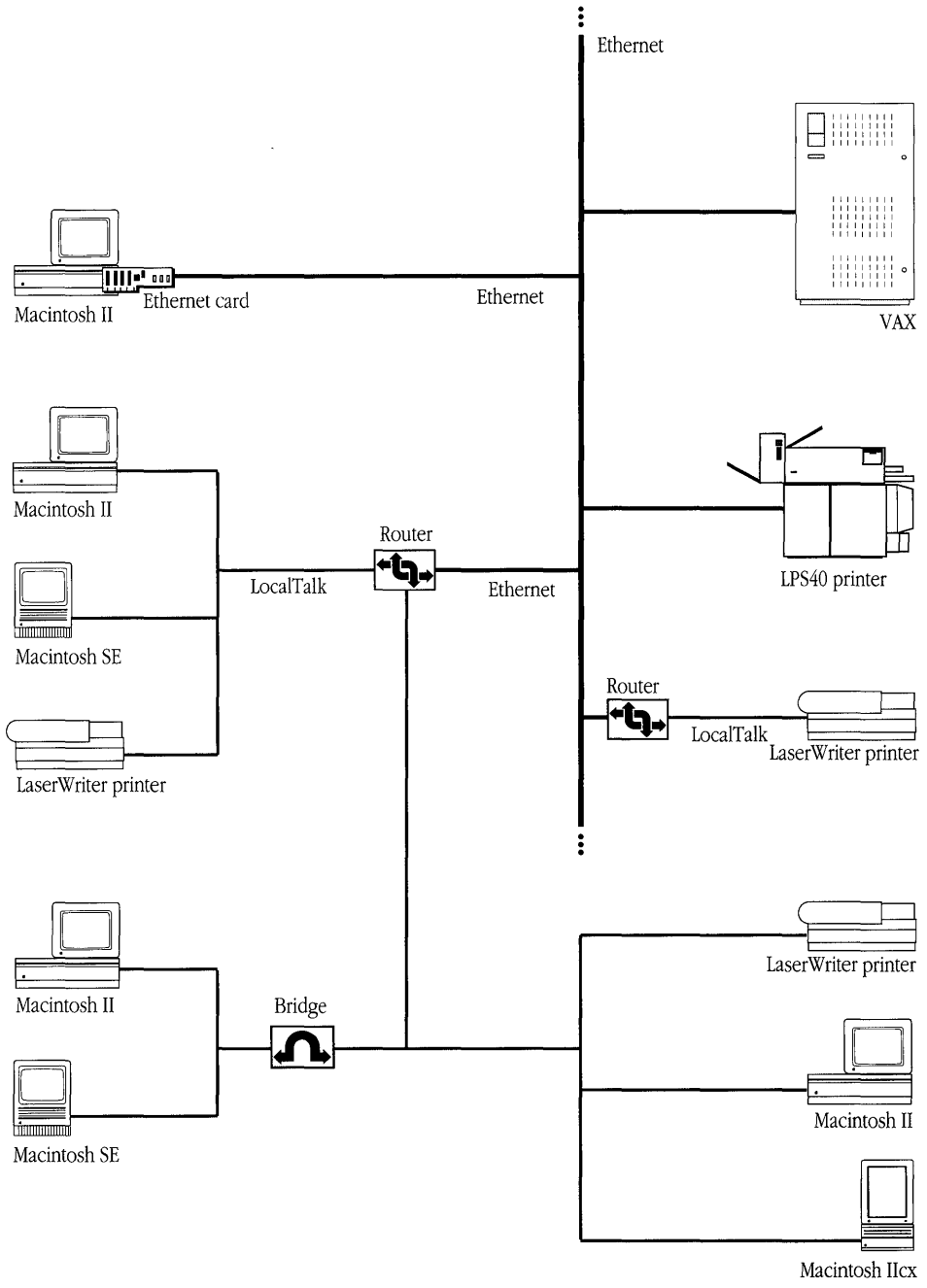


Figure A-1 A computer network

A computer with multiple connections to the network can act as more than one node. For example, if your Macintosh 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.

To make life easier, 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 to use, 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 some 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, in order 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, however, 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.

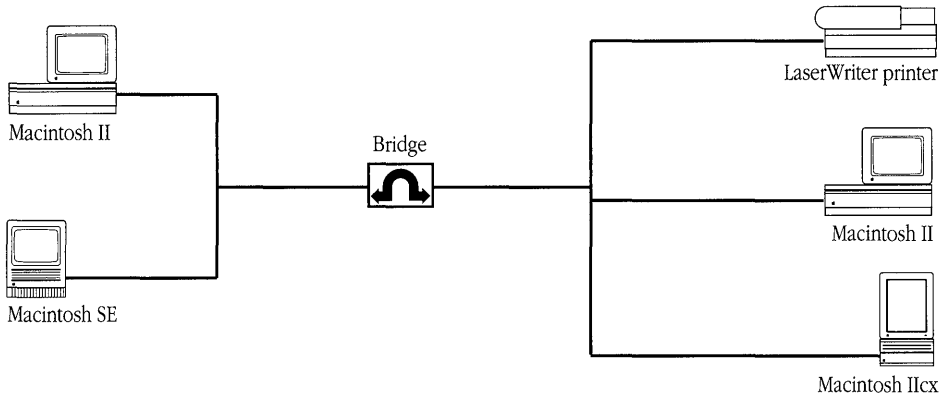


Figure A-2 A network using a bridge

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 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 parlance, 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.

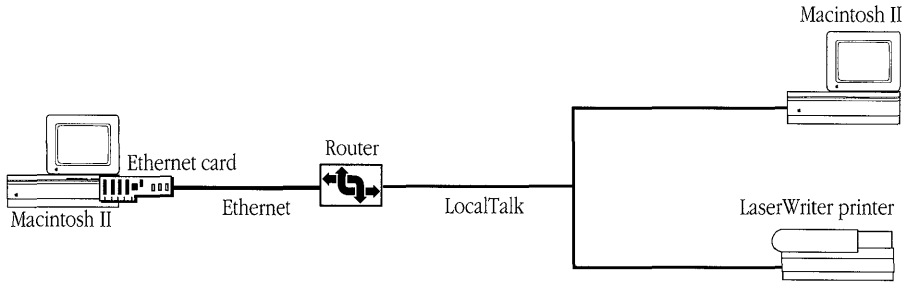


Figure A-3 An internet using a router

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-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.

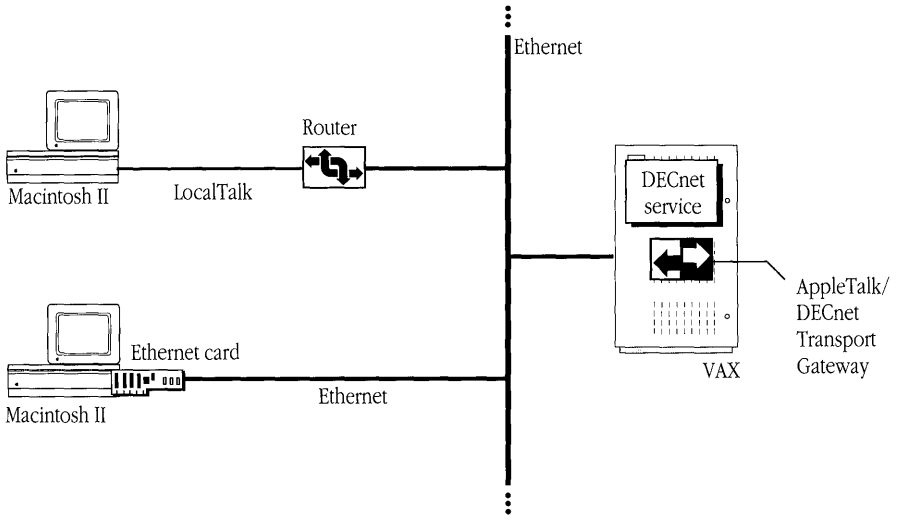


Figure A-4 An Apple-Digital internet with a router and gateway

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.

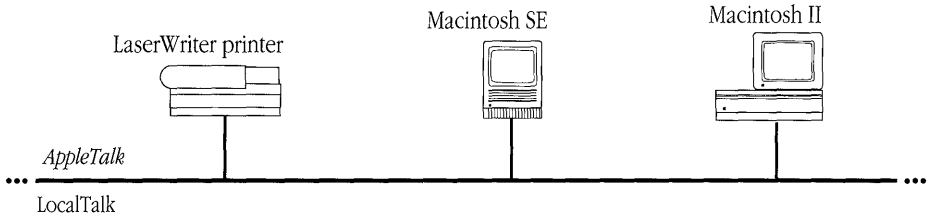


Figure A-5 An AppleTalk network

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. (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.

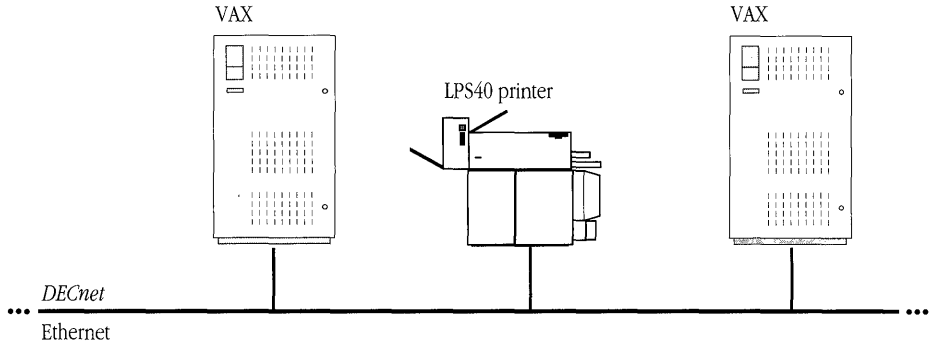


Figure A-6 An Ethernet environment

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 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 will be able to use only some of the services provided by PATHWORKS for Macintosh. See "Modem and Serial Connections" in Chapter 4.)

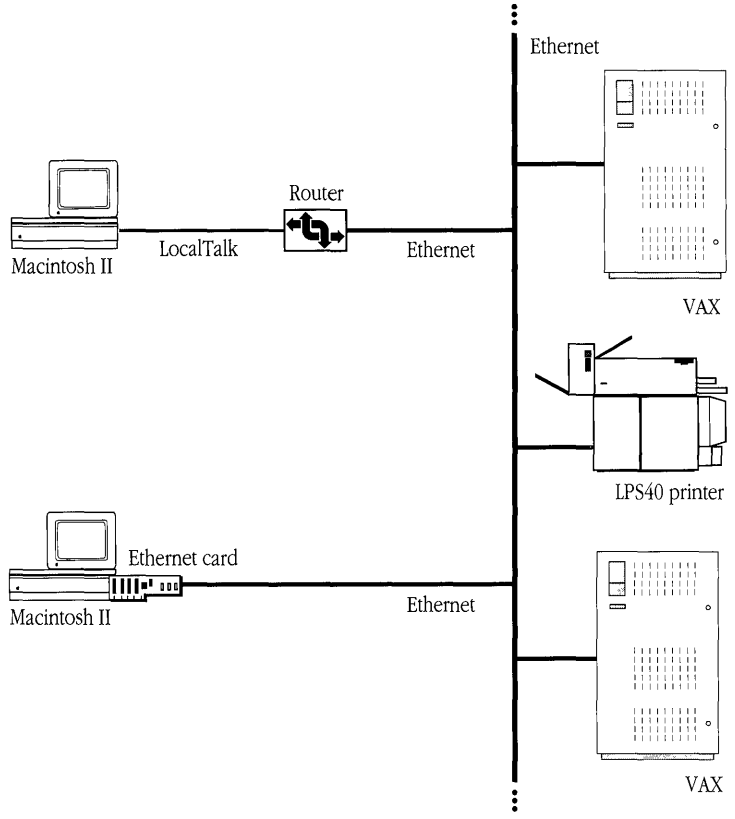


Figure A-7 An Apple-Digital internet

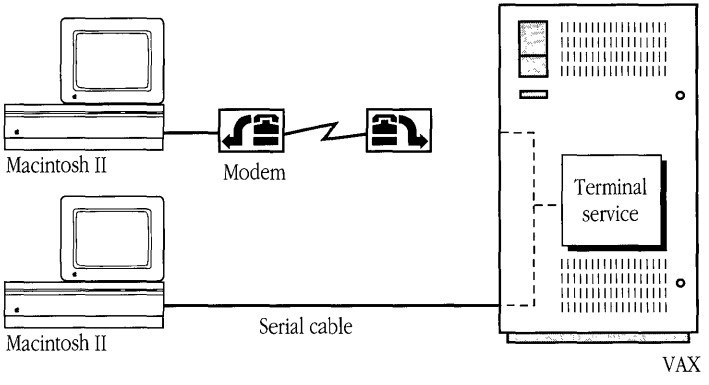


Figure A-8 Modem and serial connections

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 LAT Connection Tool allows 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 MacTerminal and MacX when you use them to access PATHWORKS for Macintosh network services. Chapter 4 describes how to use connection tools with MacTerminal. Chapter 5 describes how to use connection tools with MacX.

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, relate 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 parlance, 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 application supplied with PATHWORKS for Macintosh.

When you have logged in successfully, you will see the DCL prompt (`$`). To start the VAXshare manager, type `ADMINISTER/MSA`. This command starts a program called MSA$MANAGER.EXE. When the program begins running, you will 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 Return, the VAXshare manager executes the command. If the command does not execute, you will see an error message. If the command executes properly, you will 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 any VMS directory you have access to. 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 you want to use as a VAXshare volume. If you specify an existing directory, 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 MSAF$*volumeName*). 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 non-Macintosh storage device, 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 sections, this manual uses *mount* in the first sense. In this section, *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 upper- 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: *null character* (\$00) = ≈ : @ You must enclose the string in double quotation marks if the string contains upper- 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.

(continued)➡

Table B-1 VAXshare management command parameters *(continued)*

Parameter	Description
pathName	A string of up to 364 characters. The value for this parameter must specify the directory path for a volume. The directory path consists of the device name and the directory and subdirectories where the volume resides. The device name must be followed by a colon. You must enclose the directory and subdirectories in square brackets ([ ]) or angle brackets (<>). Separate subdirectories using a period (.) Each subdirectory name is a string of up to 39 alphanumeric characters, including the underscore (_), hyphen (-), and dollar sign ($) characters. You cannot use a hyphen as the first or last character, or the dollar sign as the first character. See the `ADD VOLUME` 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 upper- and lowercase characters, or includes spaces. See the `ADD VOLUME` and `MODIFY VOLUME` commands.
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: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains upper- 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: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains upper- 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.

(continued)➡

Table B-1 VAXshare management command parameters *(continued)*

Parameter	Description
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: *null character* ($00) = ≈ : @ You must enclose the string in double quotation marks if the string contains upper- and lowercase characters, or includes spaces. See the `ADD VOLUME`, `MODIFY VOLUME`, and `REMOVE VOLUME` commands.
VMS-password	A string of up to 31 characters. The value for this parameter must specify a VMS password. The string can contain any alphanumeric character, as well as the underscore (_) and dollar sign ($) 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. Qualifiers are joined to a command or parameter by a slash (/). All qualifiers are optional except the `/ROOT_DIRECTORY` qualifier of the `ADD VOLUME` command. Qualifiers and command parameters can be listed in any order. Some qualifiers also have parameters that follow the qualifier; 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 in order to use this command.

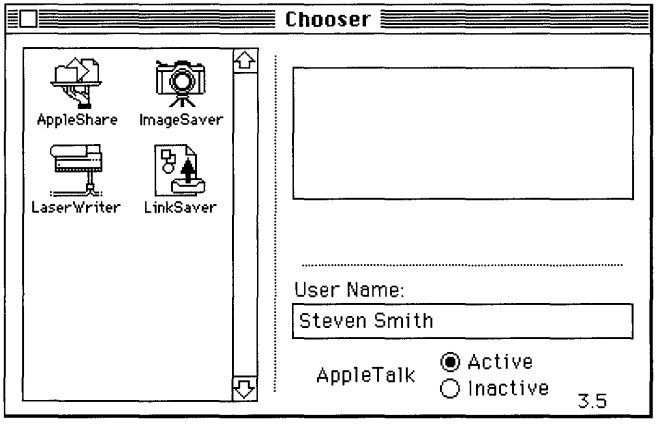
There are other DCL commands that apply to VAXshare servers. However, these commands are privileged. Privileged commands are available only to certain people, such as the system administrator. These commands are not described in this guide.

ADD ALIAS

Command `ADD ALIAS` *Chooser-UserName 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.

Chooser-UserName is the name that you have 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 upper- 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 "Steven Smith" smith
```

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. *volumeName* specifies the volume to dismount. You must enclose the parameter in double quotation marks if the volume name contains upper- 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 will be prompted for one.

Example

```
MSA$MANAGER> help mount
```

MODIFY VOLUME

Command `MODIFY VOLUME` *volumeName*

Qualifiers

`/ACCESS=READ_ONLY`
`/ACCESS=WRITE`

`/PASSWORD=`*password*
`/NOPASSWORD`

`/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. ◆

volumeName specifies the name of the Macintosh volume you want to modify. You must enclose the parameter in double quotation marks if the volume name contains upper- and lowercase characters, or includes spaces.

The `MODIFY VOLUME` command has three qualifiers:

- `/ACCESS` specifies the type of access allowed to the volume: write-enabled or read-only. `/ACCESS=READ_ONLY` allows the 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-senstive 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.
- /VERIFY determines whether the VAXshare file server will perform verification of the data stored on 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 more time-consuming. With full verification, VAXshare will check 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 will be 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 in order to use this command. ◆

volumeName specifies the name of the Macintosh volume you want to mount. You must enclose the parameter in double quotation marks if the volume name contains upper- 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 upper- 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 multi-server VAX 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. *serverName* is the name of the server you want to be the current server. You must enclose the parameter in double quotation marks if the server name contains upper- 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.EXE 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 upper- and lowercase characters, or includes spaces.

Example

```
MSA$MANAGER> show alias "Eric Smith"
```

SHOW CHARACTERISTICS

Command `SHOW CHARACTERISTIC`

Qualifiers `/PERMANENT`
`/NOPERMANENT`

Description This command displays the currently selected VAXshare file server's characteristics: the server name, number of connections available, 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 server(s) available on the selected VAX. The command shows the 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 upper- 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

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
```

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 priveleges for that folder.

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 applications. 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, AppleShareworkstation 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 in order 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 up 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 applications 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 network system A networking environment that includes computers and other devices, software applications, 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.**

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.

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.**

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 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, 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 application 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 application that created the file.

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.**

DECterm A DECwindows terminal emulation application. 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, 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 applications running on VAX computers. See also **MacX, X Window System.**

DECwindows application 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 applications by using the MacX server on your Macintosh computer. See also **MacX, ULTRIX, X 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.

directory A list of files on a storage device. Directories usually contain a hierarchical set of subdirectories.

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 cabling. EtherTalk enables you to use Ethernet cabling 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.**

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 applications 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 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/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 whose user interface is composed of graphic elements, such as windows, menus, and buttons, as opposed to alphanumeric characters. Graphics-based applications require display devices with controlling hardware and software that enable the display of graphic elements.

installation The process of adding or changing information on a Macintosh computer. For example, the Installer application 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 you install on your Macintosh. The LAT Tool lets you access LAT services on Digital computers. See also **connection tools, Local Area Transport Protocol.**

LAT protocol See **Local Area Transport Protocol.**

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.

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 at startup. 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 applications 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 supplied with PATHWORKS for Macintosh. MacX is Apple Computer's implementation for the Macintosh of the X Window System, providing an X server that takes advantage of the Macintosh user interface. MacX allows you to access DECwindows applications running on VAX computers. See also **DECwindows application, X 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.

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 applications—that is, to use the application you won't need to know anything about PostScript, nor will you see it at work. However, if you learn PostScript, you will be able to embed the codes in applications 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 in managing 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 becomes ready. See also **print queue.**

protocol See **communications protocol.**

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 right 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 applications. Resources are stored in the resource fork of a Macintosh file. For example, a resource might provide a menu, font, or icon for an application.

resource fork The part of a Macintosh file that contains the resources used by an application, 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.**

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 application windows are displayed in the root window. See also **MacX, rootless, root window.**

rootless In MacX, a style of operation in which DECwindows application 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 parlance, 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") applications. These applications 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 that lets you start other applications, lets you customize the DECwindows working environment, and provides status information about the interaction between your Macintosh computer and other DECwindows applications. See also **DECwindows application.**

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 up 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: 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 in order to interact with the operating system. Other terminal services might include word processing or accounting applications. 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 An application that you can use from a computer terminal without first having to log in to the computer on which the application runs.

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–Digital network, software running on a VAX computer that stores documents, folders, and applications, 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–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 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 applications, such as MacTerminal, that support the Macintosh Communications Toolbox.

X Window client An application, running on a remote computer, that you access through an X server. For example, DECwindows applications are X clients that run on VAX computers; you access them with the MacX server on your Macintosh. See also **DECwindows application, X server, X Window System.**

X Window environment A computing environment based on the X Window System. When you use MacX to access DECwindows applications, 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 and lets you access DECwindows applications, 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 applications (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 client, X 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.

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