DAVE 2.0 Beta Manual

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Chapter 1

Introduction

How to Use This Manual

This manual is organized into sections that give users increasingly more detail. Users may only need to read Chapter 2 on Installation and the Quick Start section in the User's Guide to begin using DAVE. Although DAVE is very intuitive, additional information is provided in the User's Guide to explain all the product's features. Systems Administrators can find detailed technical information in the Technical Information Guide and in the NetBIOS Control Panel guide. In addition, the Troubleshooting Guide gives a step-by-step method for diagnosing problems. If you find a term or acronym that you are not familiar with, refer to the Glossary.

What DAVE Does

DAVE is software that enables Macintosh users to participate in Microsoft networks with file and print services. DAVE is installed directly on the Macintosh computer and provides Macintosh users with the ability to mount shared directories on Windows NT (Server and Workstation), Windows 95, Windows for Workgroups and now other Macintosh computers. DAVE also provides Windows users the ability to use Macintosh file and printer resources.

DAVE performs all communications using the industry standard protocol TCP/IP with a NetBIOS driver that is fully RFC 1001/1002 compliant and supports Windows Internet Name Server (WINS). All services are implemented using the Common Internet File System (CIFS protocol). CIFS is an enhanced extension of the desktop cross-platform protocol for distributed file sharing called Server Message Block (SMB).
Utilizing CIFS and X/Open protocol standards, DAVE gives Macintosh users simultaneous read and write access to files stored on remote computers without first requiring users to download or copy the files to a local drive. Using the Chooser, users mount systems and browse for resources both in their own workgroup and in other workgroups. Mounting a volume is very similar to AppleShare but uses no AppleTalk protocols.

DAVE provides direct integration with Services for Macintosh and NTFS by using the same format for storing Apple resource files and finder information on NT servers. By using DAVE with Remote Access Services (RAS), Macintosh users can access NT servers from remote dial-up locations, sharing files and accessing numerous applications over an organization's intranet and the Internet.
DAVE is implemented as a modular set of Macintosh drivers, extensions and applications that can be tailored to the needs of the individual Macintosh user. DAVE utilizes the Apple File System Manager to provide compatibility with future Mac OS versions. In addition, DAVE's NetBIOS driver can be configured to use DHCP for simpler network management.

What DAVE Needs From a Macintosh

DAVE requires the following hardware and software:
- Any Macintosh with a 68020 or higher processor
- Mac OS 7.5.x with a minimum of 8 megabytes of RAM

- Apple's MacTCP or Open Transport TCP/IP
- Any hardware required to run TCP/IP

What DAVE Needs From the Microsoft Network

DAVE requires at least one of the following systems:
- Windows NT Workstation or Server version 3.51 or later
- Windows 95
- Windows for Workgroups with a TCP/IP driver
- Other CIFS Compliant Server (e.g. SAMBA)
- Macintosh running DAVE Server

How to Get Additional Support

If you are having trouble getting DAVE to operate properly, please read the Troubleshooting chapter of this manual. You should be able to correct most problems easily.

The best way to report software problems is to do it in writing. This method provides a tracking mechanism that ensures a resolution for every problem reported. Additional information on support is provided in Appendix B of this manual. All correspondence should be addressed to Thursby Software Systems. Several forms of electronic mail are also supported. Problems may also be reported via facsimile (FAX) machines.

THURSBY SOFTWARE SYSTEMS, INC.
5840 West Interstate 20
Arlington, Texas 76017 USA
TELEPHONE: 817-478-5070
FACSIMILE: 817-561-2313
http://www.thursby.com
Internet support: dave@thursby.com
Internet sales: sales@thursby.com

IMPORTANT: Be sure to complete the registration card enclosed in your distribution kit! TSS will need this information in order to provide you with support and future updates. You can provide us with this information by mail, facsimile or over the Internet. Further instructions are provided on the registration card.

We realize that sometimes you may have a problem that just can't wait and requires a telephone call. If you have an immediate need for problem resolution, you can call TSS at the number shown above during your warranty period for additional assistance. Although unlimited written problem reporting is supported, we must restrict support related phone calls to a maximum of four (4) per license without additional support charges.

Installation Road Map

This section is designed to be a quick reference for people who do not read manuals and/or are setting up a small peer to peer network.

If you don't have TCP/IP installed and configured on your Macintosh read Appendix D, "Host Configurations" section for Macintosh TCP/IP.

If you are connecting to a Windows PC and have not yet configured your PC to use Microsoft Networking over TCP/IP read Appendix D, "Host Configurations" section for your particular OS.

Once you've configured TCP/IP and can "Ping" the Macintosh from another computer on your network, then you're ready to install DAVE.

Insert your DAVE floppy and double-click on the Installer icon. Follow the instructions on the screen. For further details on installation, see Chapter 2, "Installation".

After installing DAVE and restarting your Macintosh, you will need to configure NetBIOS. Open the NetBIOS control panel and enter:
- the license information
- a NetBIOS name for your Macintosh
- a workgroup or domain name that already exists on your network
- a description that will help network users to recognize your computer
- if your network uses DHCP for TCP/IP and you are using OpenTransport, you can check the DHCP check box so WINS can be automatically configured.
- enter your primary (and secondary) WINS server IP addresses if you have them on your network

NetBIOS configuration is complete. For more detailed information on NetBIOS, see Chapter 3, "NetBIOS".

You should be able to close the NetBIOS control panel, open the Chooser, select DAVE Client and view the network. For more information on the DAVE Client, see Chapter 5, "DAVE Client".

For troubleshooting tips please see Chapter 9.

If you are installing DAVE on a small LAN the default settings should work. If you are installing on a large LAN then you may need to contact your Network Administrator for the following information:

- WINS address
- DHCP (Yes/No)
- DNS (Yes/No)
- Domain Name Server Address
- Router address (Default gateway)

Once you have this information please read Chapter 2 "Installation", Chapter 3 "NetBIOS", and Appendix D "Host Configurations."

Chapter 2

Installation

Installation Requirements

Before installing DAVE, it is a good idea to configure your Macintosh for use with TCP/IP. You may have already done this if you are using other TCP/IP products such as Netscape or Fetch. DAVE will not work unless your Macintosh is properly configured. It is also a good idea to read the notes in the "Readme" file that appears when you insert the DAVE media. Double click on this file to read it. The Readme file may contain important changes to this manual and information you may need to know before installation.

The procedures for installing DAVE are quite similar to installation of most Macintosh products. Simply insert the floppy disk, and double click on the installer icon (figure 2-1). Have your license handy so you can enter the information when DAVE begins.

Figure 2-1: Installer icon

Using the Installer

The DAVE installer will verify that your system has the required software and disk space available. If you do not have enough disk space for DAVE the Installer will tell you how much you need. NOTE: If you copy DAVE from another Macintosh, you may not acquire the correct versions.

"Easy" install will install the entire DAVE product. "Custom" install allows you to specify the parts of DAVE that you wish to install.
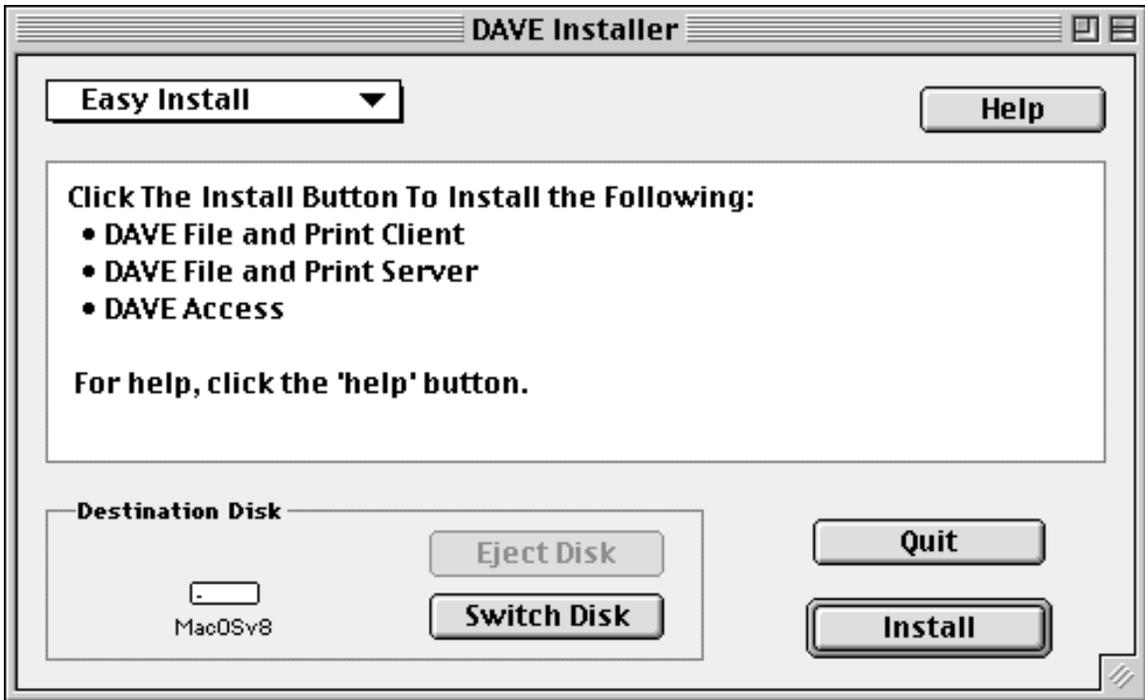
Figure 2-2: Easy Install

You may wish to install only the client software or only the server software. Be sure that the correct hard drive is selected by the installer before pressing the "Install" button if you have more than one hard drive on your Macintosh.
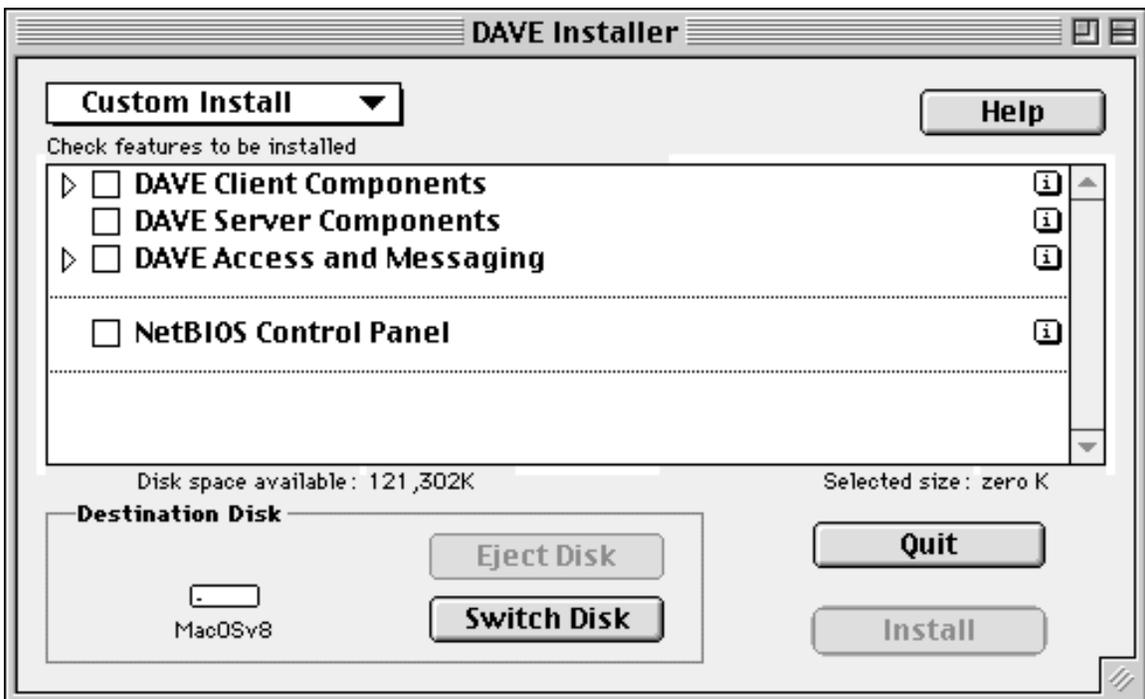

Figure 2-3: Custom Install

NOTE: Because key parts of the DAVE product are system extensions you will need to reboot your Macintosh when the installation is completed.
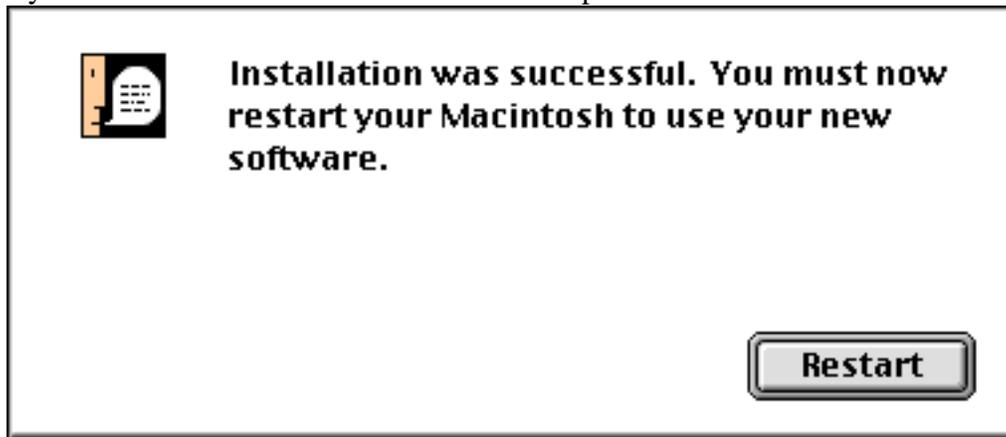

Figure 2-4: Restart your Macintosh

Configuring DAVE for the First Time

If you have a standard license, you will need to provide your license information to DAVE. To do this, select the NetBIOS Control Panel from the Control Panels folder under the Apple menu. A dialog will appear as shown in figure 2-5.

Fill in the dialog with your name, company or organization name, and the license number that was included on your registration card. If the following dialog does not display, you may not need a license number or you may have a DAVE copy that is already licensed. You can check the license information by clicking on the NetBIOS icon in the upper left-hand corner of the NetBIOS Control Panel.

To change your license information, you can click on the "Info…" button and then choose "License…" from the display menu. This will display your current license information and allow you change it.
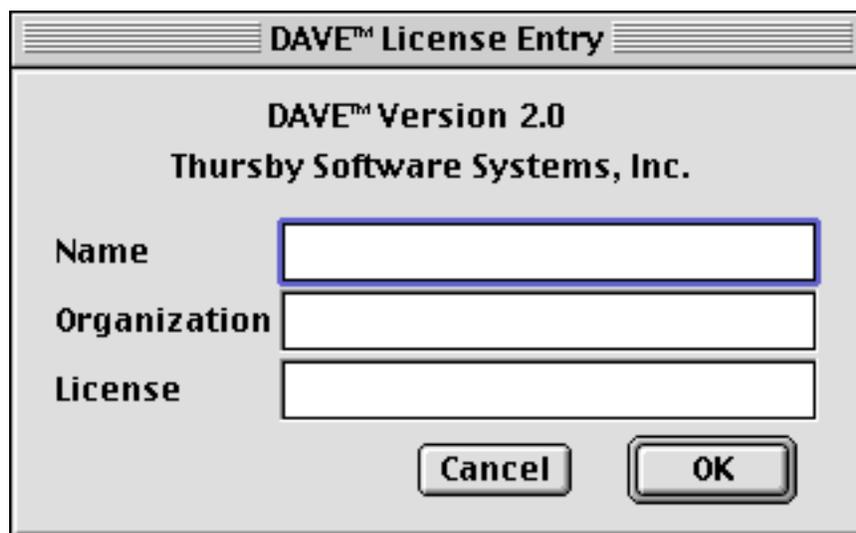

Figure 2-5: Name, Org, License

Setting Your Computer Name and Workgroup

After you have licensed DAVE, you will need to set the computer name, workgroup, and computer description in the NetBIOS Control Panel.

NOTE: At this point DAVE will check to see if TCP/IP is running, if you have a PPP connection set as your defaut configuration in TCP/IP then your modem may start to dial.

The NetBIOS Control Panel is located in the Control Panels folder under the Apple menu. DAVE must have a computer name unique to your computer on your network in order to operate properly. This is not necessarily your username. You can use any name up to 15 characters in length. Enter your machine name into the field provided and then press the "tab" key to move to the next field. As you tab NetBIOS will verify that no other computer in your network is using the same name and your machine name will automatically be converted to upper case.

Enter your workgroup or domain into the workgroup field. The workgroup is the name of the workgroup or domain that you wish to browse by default when using the DAVE Client. It is also the workgroup or domain in which you will be found when using the DAVE Server. If you are unsure of your workgroup or domain name ask your Network Administrator for assistance. Again the name will be converted to upper case.

The description is optional, but may be necessary when working with Windows NT servers. This is what other users will see as a description of your computer when browsing the network. It should describe your computer better than the machine name. The description may be mixed case.
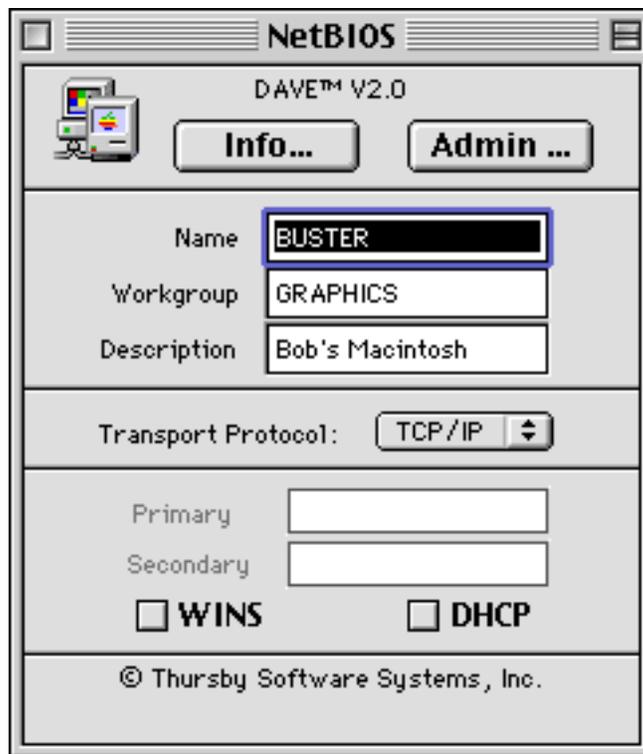

Figure 2-6: NetBIOS Control Panel

WINS Addresses

WINS (Windows Internet Name System) is a service of Windows NT which maintains a list of computers on your network. If your network uses WINS check the box labeled WINS and enter the IP address of the primary WINS server in the field provided. If you have a secondary WINS server enter its IP address in the field provided. If you do not use a WINS server on your network or if you are unsure if your network is using WINS leave the check box unchecked.

DHCP Configuration of WINS

If your network uses DHCP (Dynamic Host Configuration Protocol) for WINS configuration check the DHCP box. NetBIOS will then look on your network for a DHCP server. If one is found and it provides WINS information the WINS server addresses will automatically be entered into the NetBIOS Control Panel.

Administrative Settings

Your network may require additional settings for operation on your network. DAVE comes pre-configured for use on a "normal" network. All settings under "Admin" are for advanced users.

You are now ready to begin using DAVE.

If you have any problems, refer to the Troubleshooting chapter of this manual. For detailed information on the NetBIOS Control Panel, read Chapter 3 of this manual.

Chapter 3

NetBIOS Control Panel

This section was written so that users and Network Administrators can better understand the NetBIOS Control Panel functions.

NetBIOS is a network layer that provides a common and transparent way for applications and services to communicate. NetBIOS stands for "Network Basic I/O System". NetBIOS on PCs and Windows systems works with many different types of networks, keeping applications from having to know how to communicate with each new type of network protocol. NetBIOS provides a number of services to applications. Applications use NetBIOS names to identify their services to the network or to locate services they need to use. NetBIOS provides applications with connection oriented and connectionless services. NetBIOS names are limited to 16 bytes and conventions used in Microsoft networking use the last byte to identify different service types. This means that computer names are limited to 15 bytes.

DAVE provides a NetBIOS driver that uses TCP/IP to communicate on a network. Because the DAVE NetBIOS driver follows the Internet conventions described in RFC 1001 and 1002, it works with other vendors' NetBIOS implementations. In order to use DAVE to communicate with Windows systems, those systems must also have NetBIOS drivers that work with TCP/IP. Windows NT and Windows 95 come with TCP/IP compatible NetBIOS drivers, but Windows for Workgroups systems do not. Windows for Workgroups systems will need additional software to provide the TCP/IP compatible driver. Even though Windows NT and Windows 95 come with TCP/IP, they may not be configured to use TCP/IP with NetBIOS. Before you can get DAVE to operate correctly, you need to check your Windows network configuration to verify that it is using TCP/IP. For additional information on configuring Windows computers with TCP/IP see Appendix D.

Because NetBIOS over TCP/IP is implemented by a number of vendors and the RFCs provide for many options, configuring NetBIOS can be a complicated process. DAVE's NetBIOS driver ships with the most common settings as defaults, but allows you to change many different parameters. You probably won't need to change many settings to get DAVE working on your network.

NetBIOS over TCP/IP operates in one of four major modes referred to by the letters B, P, M, and H. Most networks only use B or H mode. By default, DAVE uses B or broadcast mode. This mode will work in most small LANS, and does not require any special settings. You should check with your Network Administrator to see if you need to operate in H mode. This mode is used on networks that have multiple subnets, and requires you to enter the address of a WINS server before DAVE will operate properly.

As an added feature, DAVE provides support for NetBIOS configuration using DHCP (Dynamic Host Configuration Protocol). If you want to use DHCP to configure DAVE from a Windows NT DHCP server, you must be using Open Transport, and your Macintosh must be configured to use DHCP in the TCP/IP control panel.

Using the NetBIOS Main Control Panel

Users and Systems Administrators can customize network settings by accessing the NetBIOS Control Panel located in the Control Panels folder under the Apple menu. Because NetBIOS runs over TCP/IP, TCP/IP must be installed and active before you can open the control panel. The NetBIOS Control Panel will also only open after a valid NetBIOS license has been entered. Before opening the NetBIOS Control Panel for the first time, have your license number handy. If you do not know or cannot find your license number, you will not be able to configure NetBIOS (see figure 3-1).
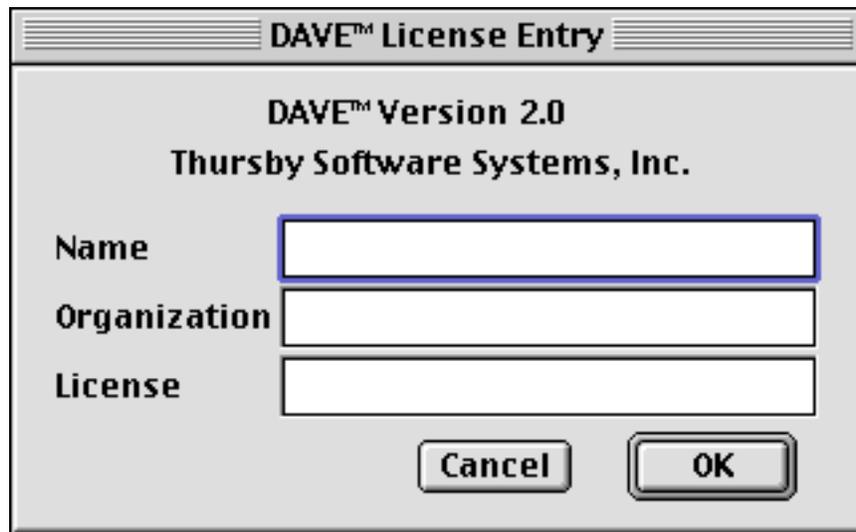
Figure 3-1: Name, Org, License

To verify or change your license information, click on the "Info…" button in the NetBIOS Control Panel and choose "License" from the "Display" pop-up menu.
The NetBIOS Control Panel is where users can change their network settings (see figure 3-2). Users can set their username, workgroup and computer description, designate their Windows Internet Name Server (WINS), obtain information about their network, and execute various network administrative tasks.
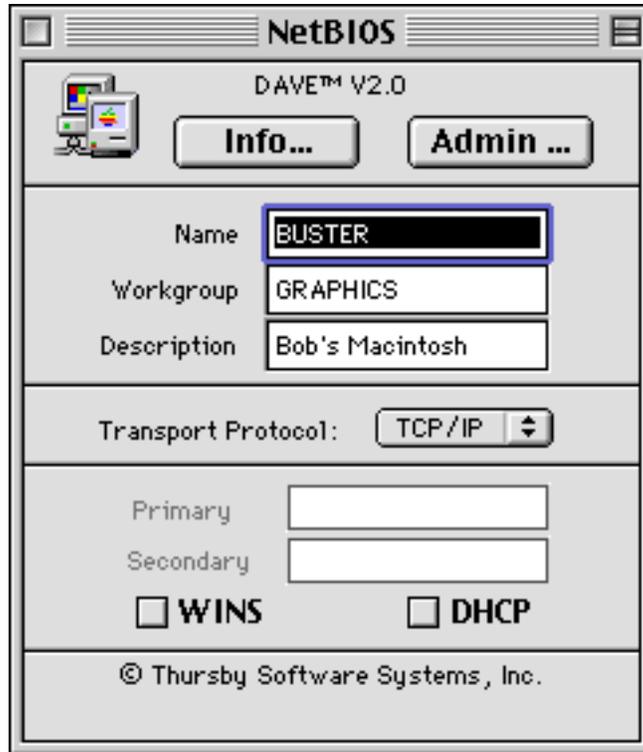
Figure 3-2: NetBIOS Control Panel

About Button

The About button is represented by the DAVE NetBIOS icon in the upper left corner of the Main control panel. When selected, NetBIOS will display the About DAVE NetBIOS screen. This screen will also display your license information, including your serial number.

Info Button

The Info button can be selected to enter the Information Panel described later in this chapter.

Admin Button

The Admin button can be selected to enter the Administrator's Options Panel described later in this chapter.

Name Field

The Name field contains the NetBIOS computer name. This field must be completed in order for DAVE to operate. The name can be up to 15 characters long and can be any name you choose provided that it is not already in use on the network. As you tab out of the Name field, the NetBIOS driver will verify that your computer name is unique on the network.

Workgroup Field

The Workgroup field contains the NetBIOS workgroup or domain name. The name can be up to 15 characters long. This is the default workgroup that the DAVE Client will browse and the default location where other CIFS clients will see your Macintosh.

Description Field

The Description field contains a description that is meaningful to the user. This field's completion is not mandatory but recommended. It can be up to 255 characters long and should describe the computer in use. Examples are "Steve's Macintosh" or "Bill's Computer". This information is used by the DAVE Server.

Transport Protocol Pull-down Menu

Currently, the Transport Protocol pull-down menu has only one option. Later releases of DAVE may include other options.

WINS Check Box

The WINS check box enables WINS access. The Primary WINS field must be completed if the WINS check box is selected. If the NetBIOS mode is set on B and you then select WINS on the Main control panel, the mode will automatically change to H. Anytime you turn off WINS, the mode will automatically change to B. Mode B is the only mode that does not use WINS. See the Administrator's Panel section later in this chapter.

Primary WINS Field

The Primary WINS field is for use when accessing a Windows Internet Name Server (WINS) on your network. Ask your Systems Administrator if this field is appropriate for your computer. If a WINS is available, type its name or IP address in this field.

Secondary WINS Field

The Secondary WINS field should only be filled in if a Primary WINS is entered. Ask your Systems Administrator if you have a secondary WINS on your network. If a backup WINS is available, type its name or IP address in this field.

DHCP Check Box

The DHCP check box enables the Dynamic Host Configuration Protocol (DHCP). When the DHCP check box is selected, the NetBIOS driver broadcasts a DHCP message to the network. If a DHCP server is available and recognizes your computer's IP address, it will determine a primary WINS server and NetBIOS mode for your computer. These fields will be automatically updated. If the server replies with any mode except B, the WINS check box will be selected.

While DHCP is selected, the WINS check box and fields will be disabled. When the DHCP check box is turned off, the WINS check box and fields will be re-enabled, but the DHCP determined WINS settings will not change. DHCP is only supported with Open Transport.

If DHCP is selected and the NetBIOS driver fails to find your WINS information, click the "Use Anyway" button. Each time NetBIOS is initialized it will check for WINS information.
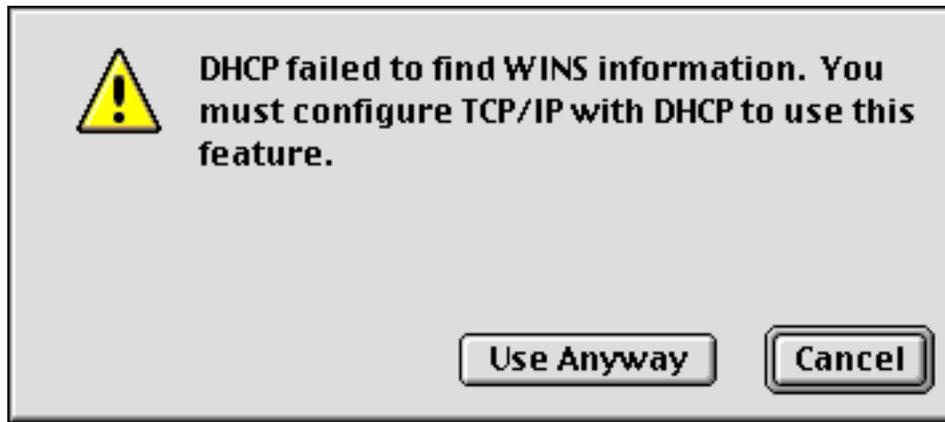
Figure 3-3:

Information Panel

The Information Panel displays when the "Info" button on the Main control panel is clicked. It can be used to display information like the NetBIOS driver's internal name and session tables, or the names tables from remote nodes. This panel is roughly comparable to the DOS command "NBTSTAT" available in Windows 95 and Windows NT. To close the Information Panel select the "Done" button.

Local Names Table

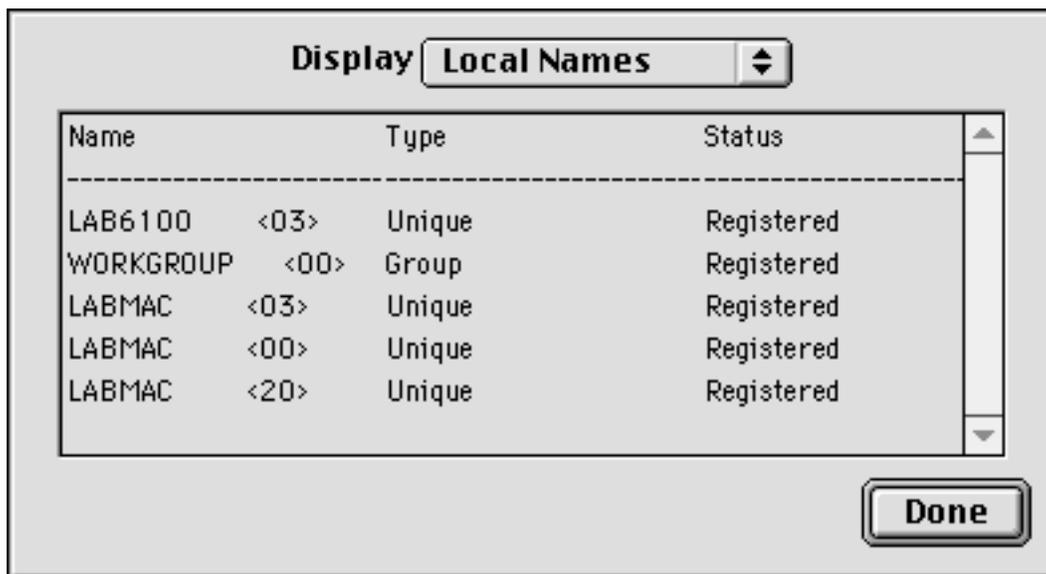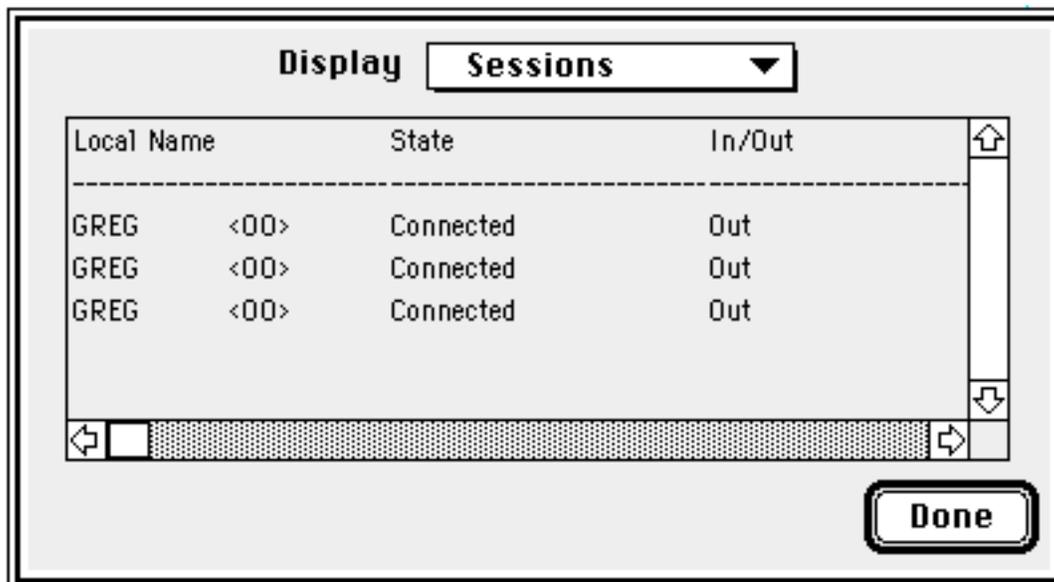The Information Panel opens using the Local Names Table.

Figure 3-4:   Local Names Table

The Local Names Table displays all the local names.

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Sessions Table

You can view the Session information by selecting the "Sessions" option in the pull-down menu at the top of the Information Panel.

Figure 3-5: Sessions Table

The Sessions Table displays information about active and pending sessions. The information includes local name, state, in/out, remote host, input and output. The following lists the definitions for each field in the Sessions Table:

Local Name - The name of your computer
State - The status of your computer's connections. The status will be a "Connected" or "Listening" state.
In/Out - The connection direction. "In" is an inbound connection and "Out" is an outbound connection.
Remote Host - The name of the computer that your computer has a connection with.
Input - The number of bytes that the connected computer has transferred to your computer.
Output - The number of bytes that your computer has transferred to the connected computer.

NOTE: To view the Remote Host, Input and Output information, you must use the scroll at the bottom of the Sessions Table (see figure 3-5).

Name Cache Table

You can view the Name Cache information by selecting the "Name Cache" option in the pull-down menu at the top of the Information Panel.
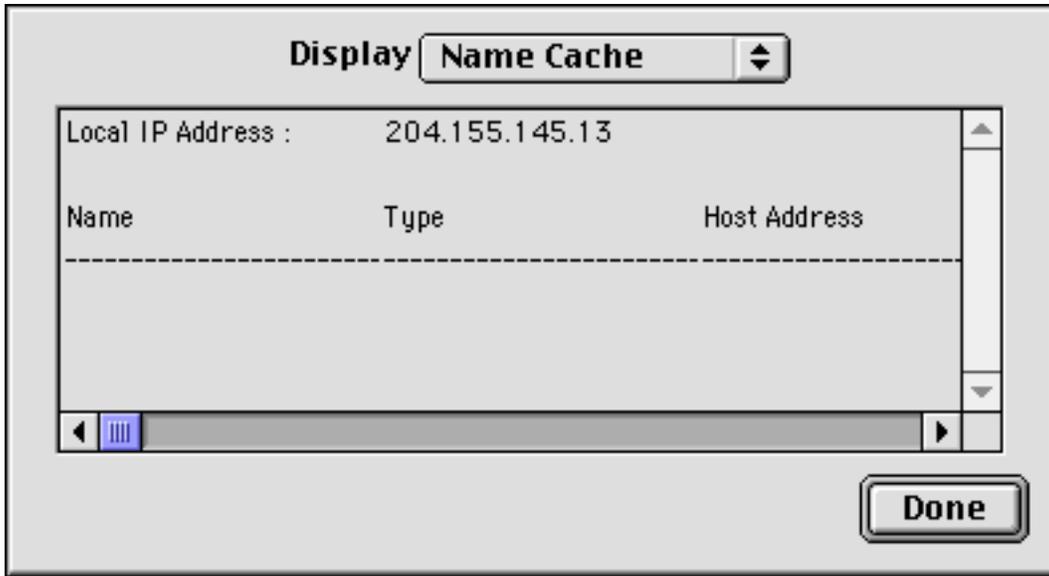
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Figure 3-6: Name Cache Table

The Name Cache Table displays the names currently in the name cache. The settings for cache timeout are in the Administrator's Panel described on page 4-11 of this chapter.
To close the Information Panel, select the "Done" button.

Remote Names Table

To display a remote computer's name cache, select the "Remote Names" option in the pull-down menu at the top of the Information Panel. A new field will appear at the bottom of the Information Panel.

After you have typed the correct remote computer name into this field, select the "Find" button. The NetBIOS driver will search for the typed name. If the computer is found, it will be queried for the names in its name cache. The names in the remote node's cache will then be displayed. The table will also display the "Type" and "Status" of each name (see figure 3-7).
If the name entered in the Remote Names prompt cannot be found, a "Name not found" message will display in the Remote Names table.
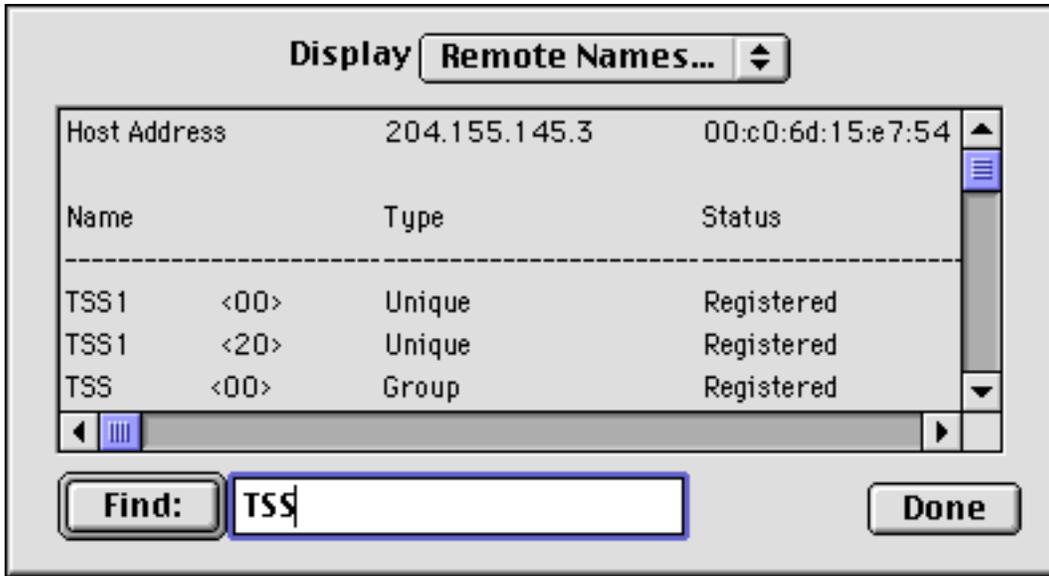
Figure 3-7: Remote Names Table

The Remote Names table can be very useful if you are attempting to learn whether or not a remote computer is acknowledging your computer on the network.
To display another remote computer's name cache, type its NetBIOS name or DNS name into the remote name field and again click "Find". Repeat this process for any computer on your network. You can also lookup a remote computer by its IP address. If the name you have entered begins with a number, DAVE will assume that it is an IP address. The following lists the definitions for each field in the Remote Names table:

Name - The names of computers in the remote computers name cache followed by a number representing the type of service associated with that name. In this list, a response of "<20>" tells DAVE that the host has File and Print sharing available over NetBIOS.
Type - Lists either "Unique" or "Group". "Unique" signifies the name of a single computer. "Group" signifies the name of a workgroup or domain.
Status - "Registered" signifies that the computer name is a registered name on the network

To close the Information Panel click the "Done" button.

License ...

Displays your current license information. If you wish to change any of this information you may click on the "Change…" button.

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Figure 3-8

Administrator Panel

To display the Administrator panel select the "Admin" button on the NetBIOS Control Panel. The Administrator panel allows the user to configure various NetBIOS settings that affect the performance of the NetBIOS driver.

WARNING: USE THE ADMINISTRATOR PANEL WITH CAUTION! HAPHAZARD USE OF THIS PANEL COULD HAVE ADVERSE EFFECTS ON NETBIOS PERFORMANCE.
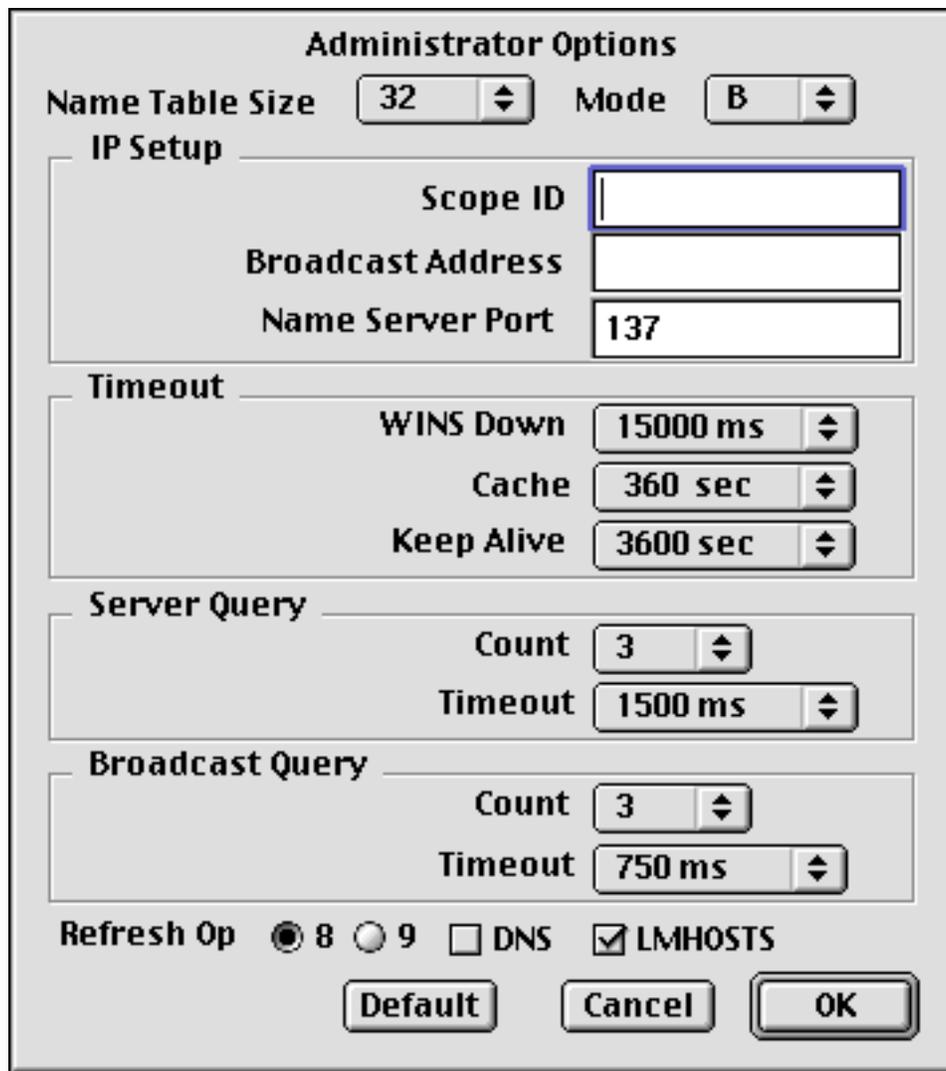
Figure 3-9: Administrator Panel

There are many options on the Administrator Panel. We will discuss each of them on the following pages.

Administrator Options

The Name Table Size Pull-down menu determines the number of names that can be stored in the name table. The name table consists of local and cached names. A large Name Table Size requires more memory, but allows for more cached names. This minimizes time spent on name queries and reduces network traffic. The optional values are: 16, 32, 64, 25 and 128. The default is 32.

The Mode Pull-down menu sets the NetBIOS mode for the local node. There are four modes to choose from:

B - NetBIOS does not use a WINS server. Instead it obtains network information by broadcasting datagrams on the subnetwork. DAVE will not find other computers in different subnets in this mode.

P - NetBIOS does not broadcast but obtains network information by sending directed datagrams to the WINS server.

M - NetBIOS obtains network information by first broadcasting datagrams on the subnetwork. If no answer is obtained, NetBIOS uses the WINS server to resolve the name.

H - NetBIOS obtains network information by first using the WINS server. If no answer is obtained, NetBIOS broadcasts datagrams on the subnetwork.

The NetBIOS mode default is dependent upon the WINS settings on the Main control panel. See the WINS Check Box section on page 4-5 of this chapter. If a Primary WINS is set, H mode is the default. If a Primary WINS is not set, B mode is the default.
The IP Setup determines how your computer interfaces with other computers on your IP network.

```
┌─ IP Setup ·····································
│
│                      Scope ID  [                    ]
│              Broadcast Address  [                    ]
│              Name Server Port  [137                 ]
│
└················································
```

Figure3-10: NetBIOS IP Setup

Scope ID - If your node is part of a NetBIOS scope, the Scope ID will be appended to your NetBIOS name during any transactions with other nodes. The default value is no Scope ID. NOTE: Computers with different Scope Ids will not recognize each other on the network. Use this option with caution.

Broadcast Address - NetBIOS will use this address to broadcast datagrams to all nodes on the network. The default value is the node's default IP broadcast address. You must enter a valid broadcast address in this field. This is one that has all ones or zero bits for the host address according to your subnet mask. The network number must be a valid net number.

Name Server Port - The Name Server Port is the UDP port NetBIOS uses to send and receive NetBIOS name service datagrams. The default name server port is 137. The NetBIOS driver assumes that the NetBIOS Datagram Service port number is the Name Server port number plus 1. The default NetBIOS Datagram service port number is 138. The NetBIOS Session Service port number is assumed to be the Name Server port number plus 2. The default NetBIOS Session Service port number is 139.

Like Microsoft's version of NetBIOS, this version of NetBIOS allows you to change the Name Server Port value. Microsoft's versions of NetBIOS use the default port numbers mentioned above and will be expecting any connecting nodes to use the same defaults.

WARNING: DO NOT CHANGE THE NAME SERVER PORT NUMBER UNLESS YOU ARE ABSOLUTELY SURE OF YOUR CHANGES.

The Timeout values are used to determine the amount of time NetBIOS waits before performing certain actions.

Figure 3-11: NetBIOS Timeout

WINS Down - The time, in milliseconds, that the NetBIOS driver waits before attempting to connect to a WINS server. This attempt will only occur if there was a previous attempt that failed. Optional values are 7500, 15000 and 30000. The default value is 15000 (15 seconds).

Cache - The time, in seconds, a remote name will remain in the name table. Optional values are 60, 180, 360, 900 and 1800. The default value is 360
 (6 minutes).

Keep Alive - The time, in seconds, that NetBIOS sends Keep Alive packets to the Client about its current sessions. The NetBIOS Keep Alive packets are a secondary effort due to TCP sending Keep Alive packets and notifying NetBIOS of all bad sessions. Optional values are 1200, 1800, 3600, 5400 and 7200 minutes. The default value is 3600 (1 hour).

Server Query specifies how the name server interacts with the NetBIOS Name Service datagram.

Figure 3-12: NetBIOS Server Query

Count - The number of times the NetBIOS driver will send the same datagram to the name server. Values are from 1 to 10. The default value is 3. If the server replies that it has received the datagram, no more packets will be sent.

Timeout - The time, in milliseconds, the NetBIOS driver will wait before sending the same datagram. Values are 750, 1500, 3000 and 15000. The default value is 1500 (1.5 seconds).

Broadcast Query specifies how the NetBIOS driver broadcasts name server datagrams over the local network.

Figure 3-13: NetBIOS Broadcast Query Settings

Count - The number of times the NetBIOS driver will broadcast the same datagram over the local network. Values are from 1 to 10. The default value is 3.

Timeout - The time, in milliseconds, the NetBIOS driver will wait before broadcasting the same datagram. Values are 375, 750 and 1100. The default value is 750 (.75 seconds).

Refresh Op ◉ 8 ○ 9

The Refresh Op parameter specifies the operation code (OPCODE) that NetBIOS uses in name refresh packets. NetBIOS sends a message to the name server on an unspecified time to time basis. This message notifies the name server that your NetBIOS name is still connected to the network. The name server replies and sets an allotted time in which your name is still valid. Before the time has elapsed, NetBIOS will send the message again. Most NetBIOS implementations use OPCODE 8. However, some implementations use OPCODE 9. The default value is OPCODE 8.

☐ DNS

The Domain Name System (DNS) check box is used for name resolution and specifies whether the Domain Name Resolver is used. When the DNS check box is selected, NetBIOS will use the DNS to resolve names. NetBIOS will only use the DNS after Windows Name Server (WINS), broadcasting and the LMHOSTS file have failed to resolve them. DNS is a fail safe so that NetBIOS resolves names that were not resolved by other methods. It is most useful when searching for an IP address of a server outside your local network.

☒ LMHOSTS

The LMHOSTS (LAN Manager Hosts) check box is used to resolve names that were not resolved by the Windows Name Server (WINS) or broadcasting. When the LMHOSTS check box is selected, NetBIOS will refer to the LMHOSTS file. NetBIOS will only use the LMHOSTS file after WINS and broadcasting fail to resolve the name. The DAVE installer adds a file named "LMHOSTS sample" that you can edit with SimpleText. The LMHOSTS file must be saved as "LMHOSTS" (all caps) and located in the Preferences folder within the System Folder.

The LMHOSTS file contains mappings of IP addresses to computer names (which are NetBIOS names). NetBIOS accesses the LMHOSTS file asynchronously, allowing it to be used for name resolution at all times. You can use SimpleText or any other text editor to create and edit the file. Each entry should be placed on a separate line and the IP address should begin the first column followed by the corresponding computer name. The IP address and computer name should be separated by at least one space or tab. Commands such as #PRE or #DOM can also be specified for each entry. If a name request is made for a name ending in hex 1C or hex 1B, and the name matches the DOM: specifier, then the name is resolved.
Example:

```
   198.137.241.30 SERVERNAME1 #PRE
   198.137.241.40 SERVERNAME2 #PRE   #DOM:COMPANYDOMAIN
   198.137.241.50 SERVERNAME3
   198.137.241.60 SERVERNAME4
```

Thi example resolves SERVERNAME1<00> and SERVERNAME1<20> to 198.137.241.40, and also resolves COMPANYDOMAIN<1C> and COMPANYDOMAIN<1B> to 198.137.241.40.

The DOM: works a little differently from Windows. Windows platfoms can put multiple DOM: entries in LMHOSTS for the same domain. The Windows machine is supposed to pick the nearest one. DAVE always picks the first one, unless the #PRE is used. Later entries are ignored. If both the #PRE and #DOM: are used. The domain is then cached with a <1C> type.

Putting #DOM entries in the LMHOSTS file will not cause them to appear as a DAVE Client Chooser item. This would only be useful to DAVE users in the following circumstances:

- There is a #DOM entry that matches the workgroup in the NetBIOS control panel. DAVE will use the corresponding IP address as the browse master.
- The user is logging onto a domain, and there is a #DOM entry for their domain. DAVE Access will get the corresponding IP address.
- DAVE Server will get the name resolved when accessing a domain controller in user-level mode.

For further information on the LMHOSTS file see the LMHOSTS Sample file in your Preferences folder. Additional information is available from Microsoft - Chapter 4, Setting Up LMHOSTS, in the TCP/IP-32 for Windows for Workgroups 3.11 - Microsoft Development Library.

The "Default" button will change all fields that have defaults to their default values.

The "Cancel" button will close the Administrator Panel without saving any changes.

The "OK" button will save all changes and will close the Administrator Panel.

Chapter 4

DAVE Access

About DAVE Access

DAVE Access is an application, normally installed in Apple Menu Items, that provides access to many CIFS networking features. With DAVE Access you can log on to Windows NT domain security once and use multiple resources without having to reenter user and password information.

Domain Logon

If you have a Domain Controller on your network and have a valid account on that domain, you can use DAVE Access to log on to your network. Once logged on, you will have access to any resources which use that domain controller for authentication without re-entering your username and password.

To log onto your network, start DAVE Access by selecting it from the Apple Menu. Choose "Log on…" from the "Access" menu. You will be prompted for your username, password, and domain name. By default, DAVE Access will automatically quit after a successful log on. If you do not want to quit, unselect "Quit after logon" from the "Settings" menu before clicking OK. Click "OK" to log on.
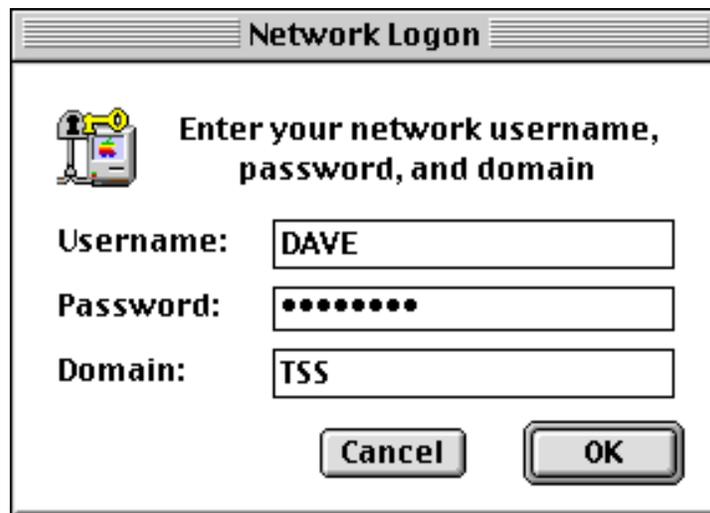

Figure 4-1: Network Logon

Domain Logoff

To log off your network, choose "Log off" from the Access menu. All mounted DAVE shares will be automatically unmounted. You will no longer be able to use domain resources via DAVE Client without supplying your username and password.

Domain Options

You can tell DAVE Access to automatically request your logon information when your Macintosh starts up by selecting the "Logon at Startup" option from the Settings Menu. This option places a document called "DAVE Access Startup" in your "Startup Items" folder. Unchecking this option will remove the file from your Startup Items folder.

The "Logoff at Shutdown" option places a document called "DAVE Access Shutdown" in your Shutdown Items folder. Upon shutting down your Macintosh, this document causes DAVE Access to log off the network, unmounting all DAVE shares in the process.

The "Enforce logon" option prevents the DAVE Client from being able to access shared resources without first logging on to the domain. You cannot change this option without being logged on to your network.

Mount at Boot

If you have turned on the "Enforce Logon" option and you have any shares which you have marked for "Mount at Boot" in the DAVE Client Chooser item, they will automatically mount on startup after a successful logon. If logon is unsuccessful, you will be prompted for your logon information for that resource. For more information on "Mount at Boot", please see chapter 4.
If you have not turned on the "Enforce Logon" option, then the DAVE Client will mount each resource normally, prompting you for security information if needed.

Domain Printers

If you are logged into a domain, your domain authentication is used for printer security as well. This is helpful if the Macintosh is used by more than one person. If you are not logged onto the domain when you try to use a DAVE Print gateway, you will be prompted for your security information. This information will be remembered by that gateway for future print jobs. To prevent your security information from being remembered by the Print Client, turn on the "Enforce Logon" option. For more information on printing using DAVE, please see chapter 7.

Popup Messages

DAVE Access works directly with Windows WinPopup service. It can be used for sending and receiving messages on your network. This can be very useful for Network and Systems Administrators who want to notify users about changes in server status. It is also useful for notifying users about print job completions. NT Administrators can use DAVE Access to broadcast messages to their users.

By default, DAVE will not receive messages from the network. To begin receiving messages start DAVE Access by selecting it from your Apple menu. Select the "Messaging Preferences" item from the Settings menu and check the box "Display received messages."

Figure 4-2: DAVE Message Preferences

DAVE will receive messages sent to your computer's name if that name is not already in use on another computer. If you do not log into your network, you may choose an additional name for receiving messages. You may specify this alternate name in the "Default Name" field. If you have not logged in, or have logged out, messages will be received that are sent to this name.

Note: The Default Name field is optional. DAVE will still receive messages sent to your computer's name regardless of whether the Default Name field is used.

DAVE handles received messages two ways. Selecting the "Display Received Messages" check box in the Message Preference dialog (see figure 4-2) will enable DAVE to popup incoming messages in a Message Received window (see figure 4-3).
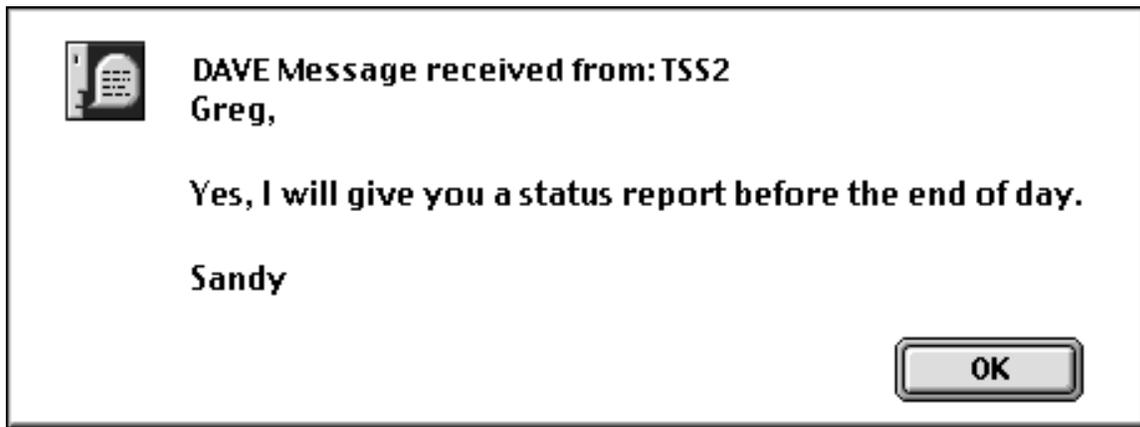

Figure 4-3: Message Received Dialog

After you have read your message, select the OK button and the message will be discarded.

The second way of receiving messages can be chosen by selecting the "Read Messages Aloud" check box in the Message Preference dialog. You must have the Speech Manager installed on your Macintosh in order for this option to work. For more information on the

Speech Manager, see Appendix F. If you choose to select the "Read Messages Aloud" check box, DAVE will read your messages for you.

You can select both the "Display Received Messages" and the "Read Messages Aloud" check boxes. The Message Received window will display first. When you close the window, DAVE will read the message aloud. If you select the "Beep when message received" check box, DAVE will play your system alert when messages arrive.

If you do not want to receive messages, simply turn off the "Display Received Messages" and the "Read Messages Aloud" check boxes then click the "OK" button on the Message Preferences dialog. When turned off the message reception removes DAVE message listening software from memory. Your selections will be saved and used when restarting your Macintosh.

Warning Messages

If the username set in your preferences is already in use on your network you may get an error notice from the DAVE Message Popup every time you start your Macintosh. This message notifies you that you will not receive messages sent to your username. If you are logged onto several machines in your network and you are using the same username for each machine, only one of the machines will receive messages for that username.

The NetBIOS name you chose for your computer may be the same as another user's username. If this happens, the DAVE Message Popup may not be able to listen for messages sent to your computer name because the messages will be directed to the other user and you will get a warning message when you start your Macintosh. If you do not want to see these warning messages, turn off the "Notify when names conflict" check box in the DAVE Message Preferences dialog.

Sending Messages

DAVE Access can be used to send messages to other users in your network. To begin, select DAVE Access from the Apple menu. Then select "New Message" from the File menu. You can send messages to individual users or computers by selecting "User or Computer" in the pull-down menu at the top of the Composing a Message window. Messages of this type are sent only to the user or computer named in the "To:" field.

You can also send messages to all the computers in a workgroup or domain by selecting "Workgroup" from the pull-down menu. Messages of this type are sent to all the computers in your network that are members of the workgroup or domain named in the "To:" field.
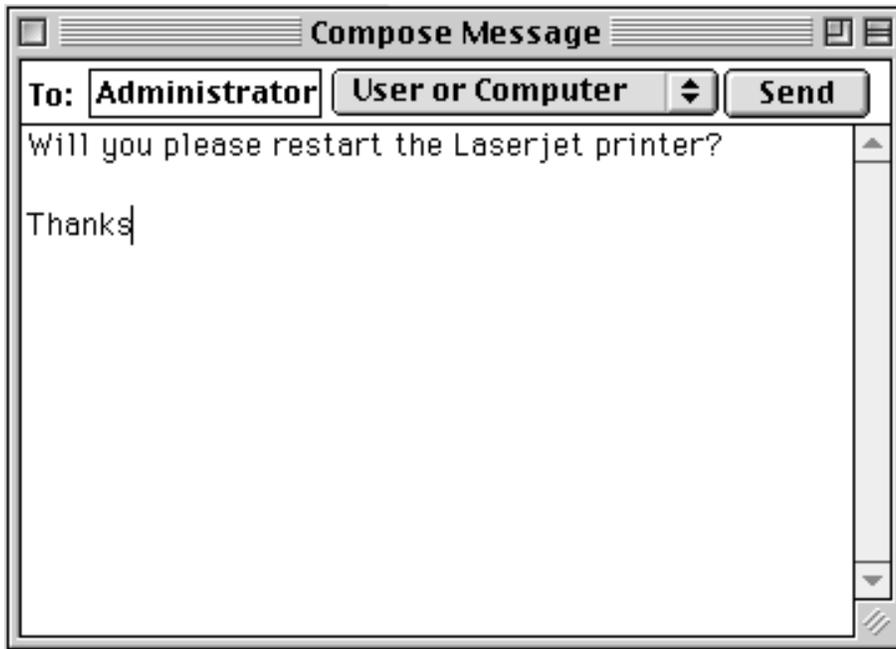
Figure 4-6: Composing a Message

Note: When using DAVE Access, a message cannot be received from the same Macintosh that sent it. If you are sending a message to your own workgroup, you will not receive it. When you have entered your message, click the "Send" button. If you want to send the same message to more than one user or computer hold down the command key when you click the "Send" button. This prevents the Composing a Message window from automatically closing. You can then enter a new name in the "To:" field and click "Send". You can use the Edit menu to cut and paste text into the Message window.

When sending messages please be aware of the following message size limits. A Windows computer will truncate any received message greater than 1,600 characters. A Macintosh computer will truncate any received message to 255 characters.

AppleScript

DAVE Access supports AppleScript scripts for mounting and unmounting shared resources. With it you can create your own "logon scripts", return information about a user, server, or domain and send popup messages to other users. Several sample scripts are installed by the DAVE installer.

To view the DAVE Access AppleScript Dictionary, run Apple's Script Editor. Choose Open Dictionary from the File menu then choose DAVE Access which is located in your Apple Menu Items folder in your System Folder.
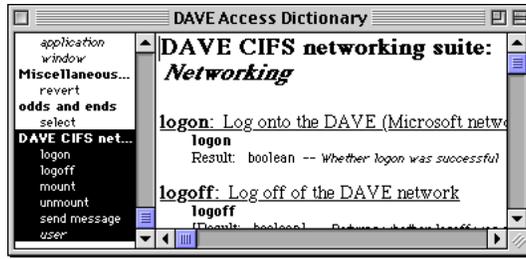
Figure 4-7: DAVE Access Dictionary

Chapter 5

DAVE Client

Using Resources on Other Computers

DAVE will let you mount shared resources from other computers as if they were on a local disk drive. This makes sharing files with Windows and Macintosh users as easy as using AppleShare. Before you begin sharing files you will want to verify that the Windows computer has been configured for sharing. Windows 95 users may want to read the Microsoft help topic "Sharing a folder with other people" or read Appendix D "Host Configurations." Ask your Systems Administrator for assistance if you have problems verifying share configuration on a Windows machine.

Finding Other Computers on the Network

In order to find a computer on your network you must first know the computer's name. Ask your Network Administrator for a list of computer names if you have problems finding a computer on your own.

To find a list of systems on the network, open the Chooser from the Apple menu. A dialog similar to figure 5-1 will display. The DAVE Client icon will appear in the upper left hand pane of the chooser window. When you click on the DAVE Client icon, a list of computers from your workgroup will appear in the "Select a Server" list on the right. Double click the computer of your choice or select the computer and click the "OK" button. If your workgroup field is blank in the NetBIOS Control Panel no servers will appear in this list only "Entire Network" and "Mount Manually".
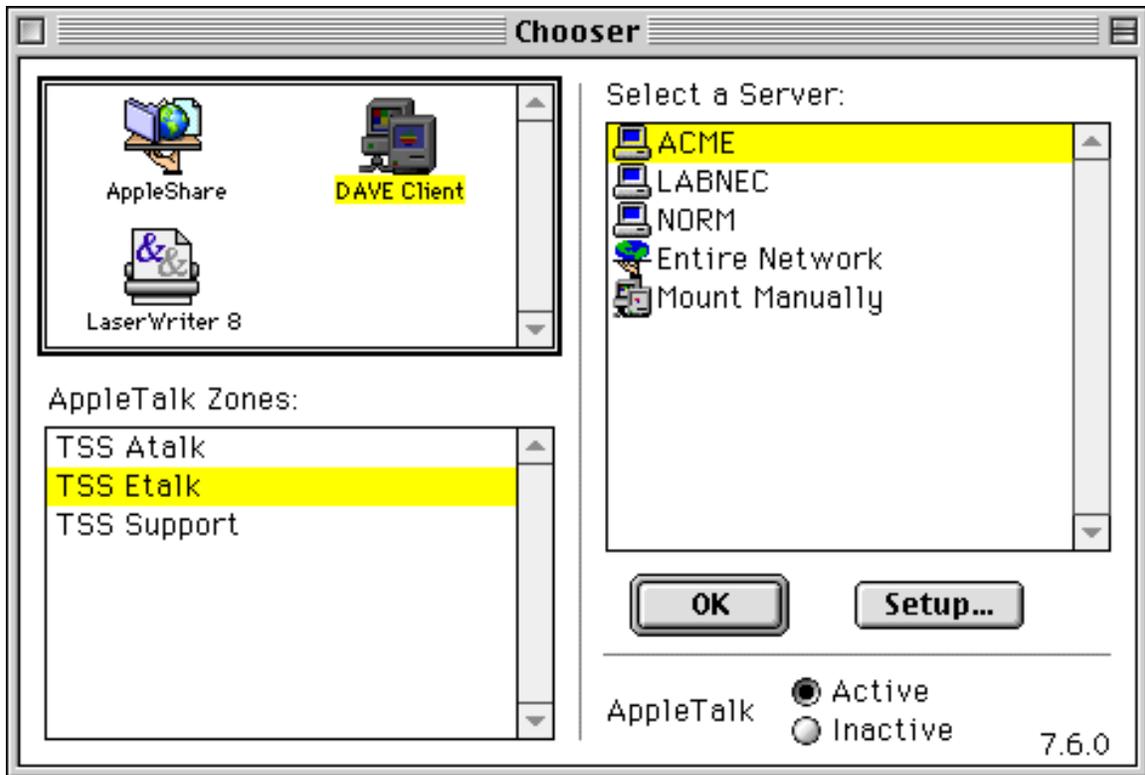
Figure 5-1: Chooser Window

Some networks have more computers and workgroups than can be displayed in the Chooser. These computer can still be reached manually or by adding them to the list of commonly used servers. These options are described later in this chapter.

If no servers appear in the "Select a Server" window or the server you wish to mount is not listed, you can mount it manually by double-clicking on the "Mount Manually" item and entering the Server and Share names. Traditionally this information is available in UNC format such as "\\SERVER\SHARE". Enter the information into the separate fields without the accompanying "\".

Using the "Mount Manually" item you may also mount a share by its IP address or DNS name. In the "Mount a Volume" dialog, be sure to click on "Connect Using DNS or IP" radio button. Choose "Connect Using NetBIOS" if you are entering the NetBIOS name.
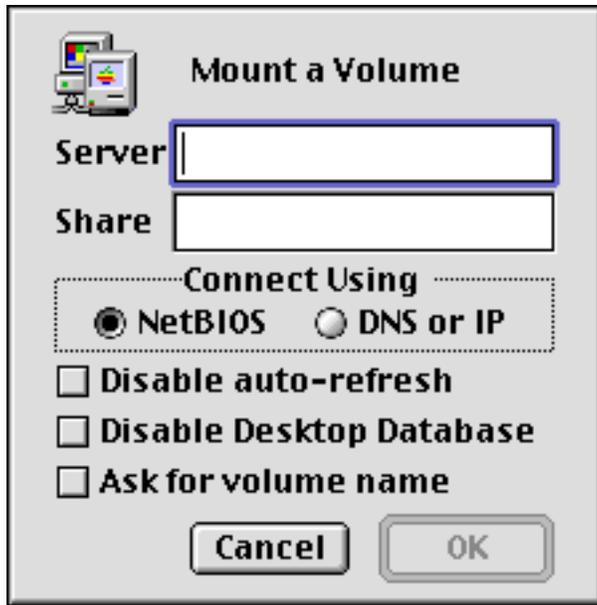
Figure 5-2: Mount Manually

Note: You can use Mount Manually to access adminitrative or hidden shares that contain "$" in their names.

To select a computer in a different workgroup double click on the "Entire Network" item. A window containing all of the workgroups and domains available will display. Now you can browse your entire network for any specific computer. For detailed information, read "The Entire Network" section of this chapter.

Mounting Shared Resources

After you have double-clicked on a computer from the DAVE Client window a list of shared resources will display. Depending on the security used by the remote server you may be prompted for a username and password. If you do not know your username, password, and domain ask your Systems Administrator.
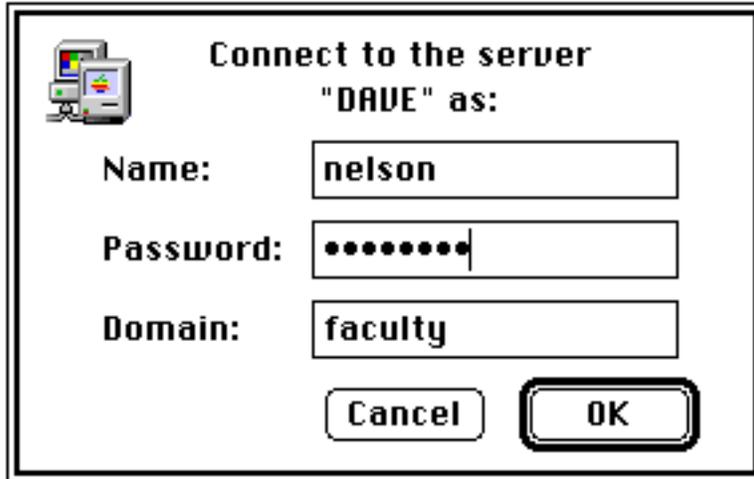
Figure 5-3: Security Entry Dialog

NOTE: If you do not have a Primary Domain Controller (PDC) leave the domain field blank.

After completing the username, password, and domain fields select the "OK" button and DAVE will display a list of shared resources.

Figure 5-4: Mounting Shared Resources

There are two types of resources found in the Mounting Shared Resources dialog. The folder icon designates a shared file system and the printer icon designates a shared printer. Double click a folder icon or select a folder icon and click the "OK" button.   An icon representing the shared resource will appear on your desktop (see figure 5-4).

NOTE: When selecting a shared printer from the Mounting Shared Resources dialog, an icon will not appear on the desktop. If printers d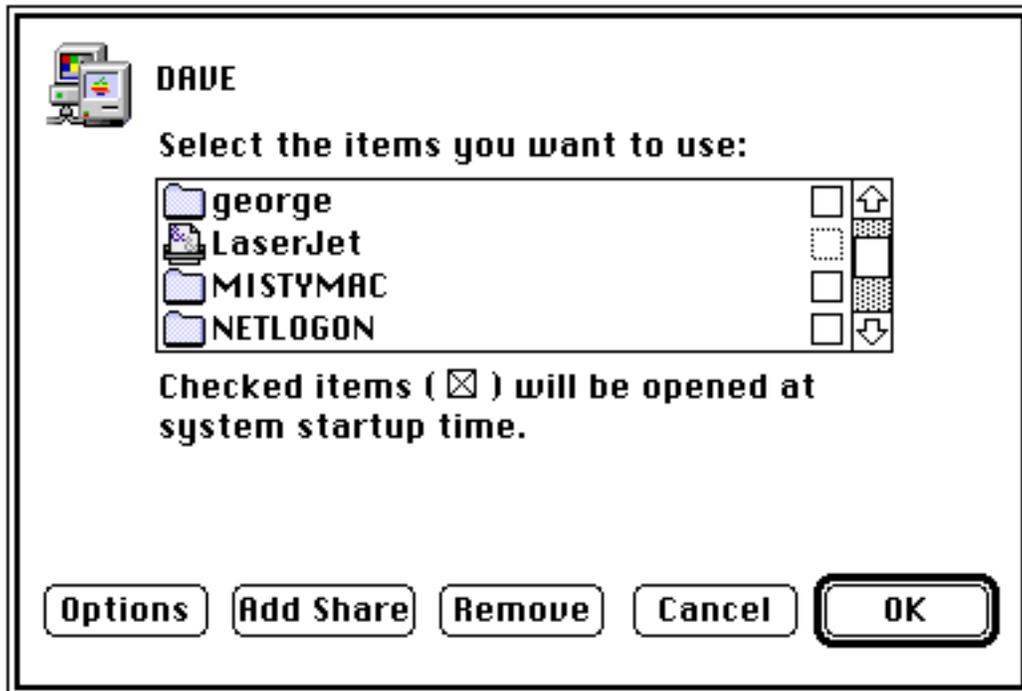o not show up then you do not have the DAVE Print Client installed or it's extension has been disabled. See Chapter 7 for more information on the DAVE Print Client.

Figure 5-5: DAVE Volume Desktop Icon

You can now begin using the shared resource just like you would use any Macintosh floppy, hard disk, or AppleShare volume.

Selecting the Entire Network icon can be very useful when there are many workgroups or domains within an organization. Users may wish to use resources located in a workgroup outside of their own. To mount a shared resource on a different workgroup, open the Chooser from the Apple menu and click the DAVE Client icon. Double-click the Entire Network icon from the "Select a Server" listing. A dialog similar to figure 5-5 will display.
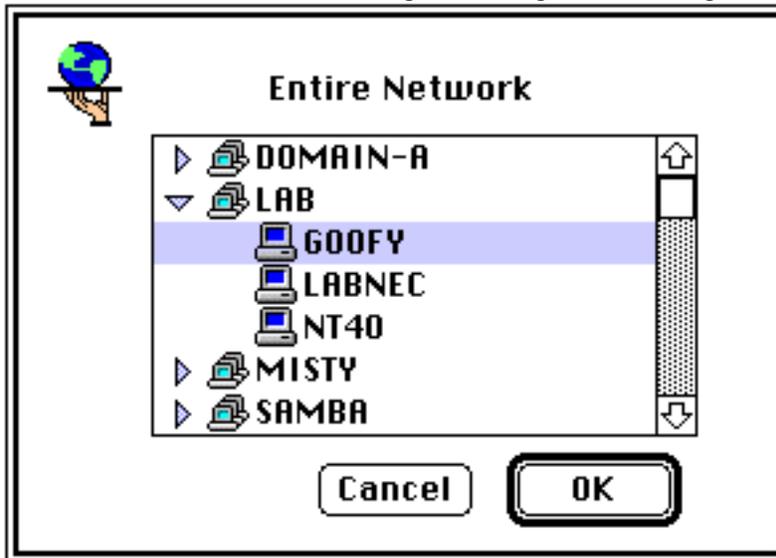
Figure 5-6: The Entire Network

From the workgroup listing in the Entire Network dialog double-click the workgroup. The computers in the selected workgroup will display below the workgroup icon. Select a computer and click the "OK" button.
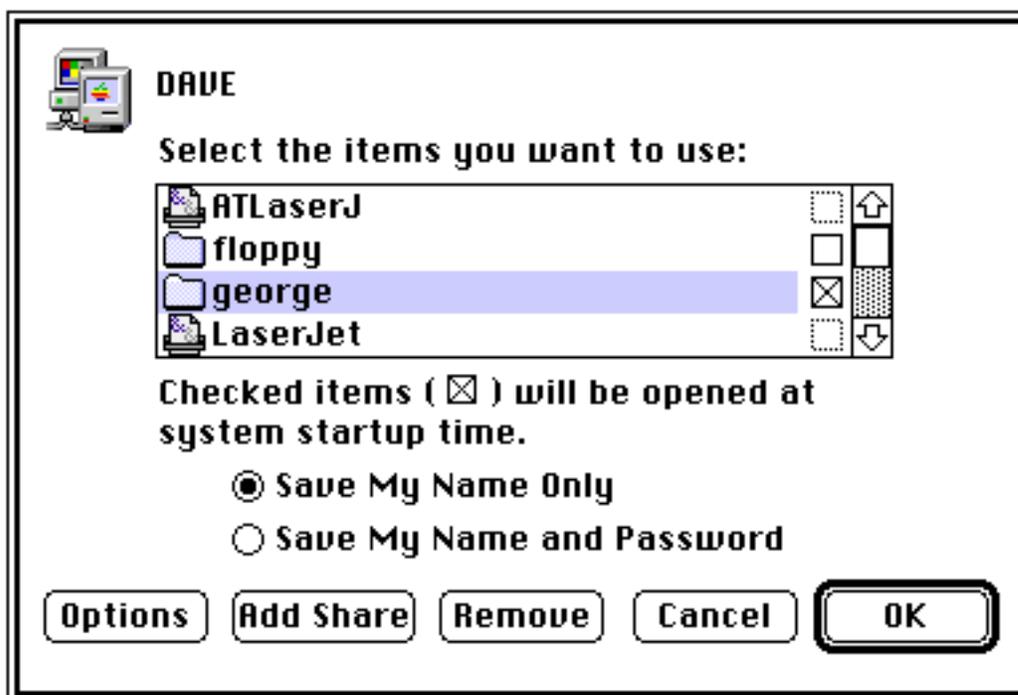
Figure 5-7: Selecting a Shared Resource

A list of shared resources on the selected computer will display. Select the shared resource you wish to mount and click the "OK" button. If you have the "Ask me for volume name" check box selected in the DAVE Setup dialog (page 3-10), you will be prompted for a volume name. You will return to the Workgroup listing and a resource icon will display on your desktop. Now you can either mount another shared resource from the Entire Network listing or click the "Cancel" button to return to the Chooser.

Mounting Shared Resources at System Start-up

Figure 5-8: Mounting at Start-up

To mount a resource at start-up, select the resource and the check box to its immediate right. After clicking the "OK" button, DAVE will remember your selection and the resource will be mounted at boot. This check box is not available for printers as they are handled via the DAVE Print Client control panel.

If you choose to mount resources at start-up, you can select one of two security options. Selecting the "Save My Name and Password" option will save your username and password for use when mounting the resource again. This saves you from ty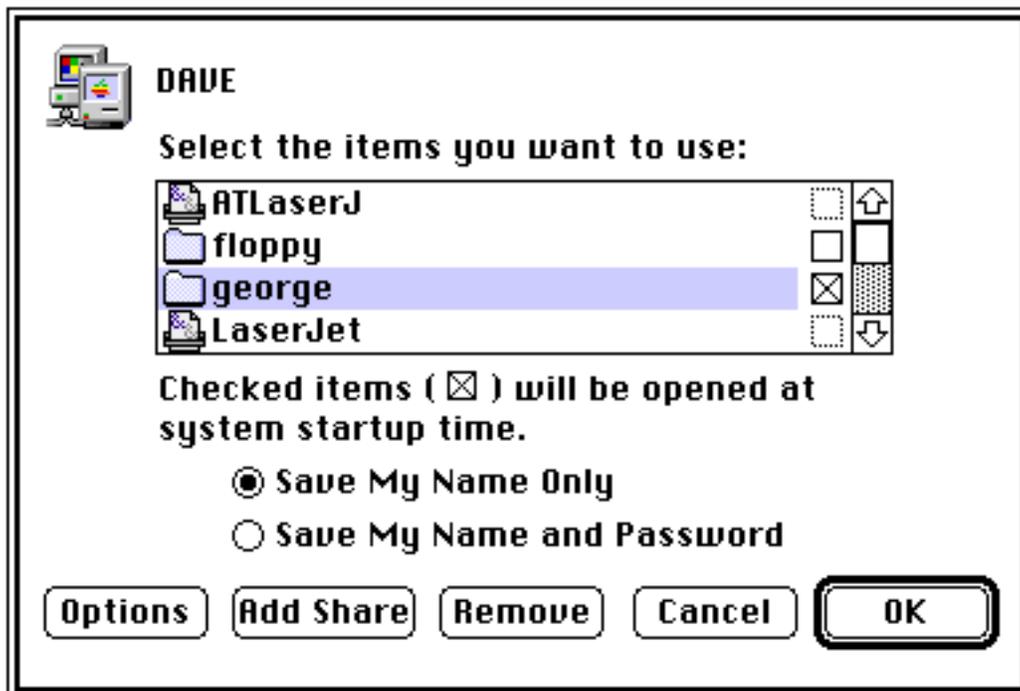ping the information again when you restart your computer. If you select the "Save My Name Only" option your username will be saved and you will be prompted for a password at start-up time. This second method is considered more secure.

If you are using DAVE Access on a domain with the "logon at startup" option you should use the "Save My Name Only" option. Shares will then only mount after a successful logon to your domain. If you use the "Save My Name and My Password" option you negate the benefits of domain security. Volumes marked for mounting on startup will mount after a successful domain logon.

If your password on the host server changes, your "Mount at Start-up", may ask you to supply the password for that resource - even if you have told the DAVE Client to remember your Name and Password. To correct this situation stop mounting at startup for that share and then turn it back on. Mount at startup settings are saved in the DAVE Client Preferences and are used for all users on the Macintosh. If you need a more "user-centric" solution, please read about using AppleScript with DAVE Access in Chapter 4. Another method for mounting a DAVE share at boot is to place an alias of the volume in the Start-up Items folder. For more information on aliases read below.

Disabling "Mounting at Start-up"

Stopping a volume from mounting at start-up is done in the DAVE Client. Double-click on the server where that share resides then uncheck the little box to the right of the share name. Click "OK". The next time you restart your Macintosh the volume should not automatically mount.

If the hosting server is no longer available on your network then you will need to delete the DAVE Client Preferences file. This is rather drastic and should only be used as a last resort. Doing this will cause the DAVE Client to revert back to its factory settings. Any shares that you have marked for mount at start-up will be forgotten. Any changes to your DAVE Client settings will also be forgotten. Your NetBIOS settings will not be affected or change.

Adding and Removing Shared Resources

To save time and effort when mounting a shared resource users may wish to add an extended path to the shared resource. First select an item from the shared resource listing click the "Add Share" button and then the "Adding a Path" dialog will display. Type in the extended path (see figure 5-8). NOTE: The path must already exist on the selected shared resource. After you type the name of your new shared path click the "OK" button. Your new extended path will appear at the top of the shared resources list. You can mount the shared resource's extended path directly without having to navigate through its directory hierarchy. For example, consider the UNC path \\SERVER\SHARE\DIR1\DIR2\DIR3. Assume that you regularly use the folder DIR3. Normally you would mount SHARE from SERVER and then navigate through DIR1 and DIR 2 to get to DIR3. This takes time, especially if DIR1 has many files. To add this share you would enter "SHARE\DIR1\DIR2\DIR3" into the "Add Share" dialog.

```
Enter shared path for  george

test\temp

                        [ Cancel ]  [[ OK ]]
```
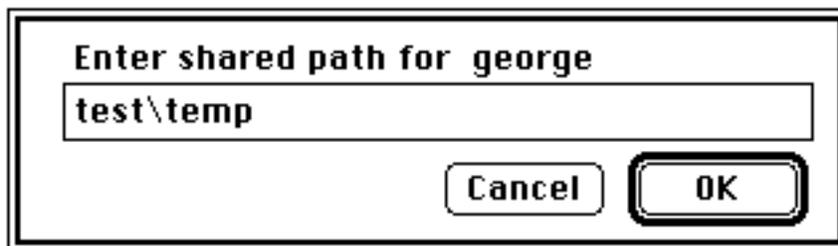
Figure 5-9: Adding a Shared Resource

When you mount a shared resource, the resource icon will inherit the name of the last folder in the path you designated. Use the "Ask for Volume Name" to specify a different name for your desktop icon. In figure 5-8, the resource icon would be called "temp".

To remove a shared resource select the resource and click the "Remove" button. This will remove shared resources that were manually entered with the "Add Share" button. Added shares are remembered in the DAVE Client Preferences file in your Preferences folder in your System Folder.

Shared Resource Options

Clicking the "Options" button will display the "Ask for volume name", "Disable Desktop Database", and "Disable auto-refresh" options.

Checking the "Ask for volume name" option will instruct DAVE to prompt you for a resource name when you mount it. The name you type will be used for the resource icon. DAVE normally defaults to the share resource name.

"Disabling the Desktop Database" will tell DAVE not to create the DesktopFolderDB folder for the Finder. The Desktop Database is where the Remembers information about applications and their icons on the shared volume is stored. Turning this feature off should speed up slow network connections.

"Disable auto-refresh" turns the automatic refresh of an open window on a DAVE share off. To manually update the contents of that window close and then reopen the window. This is a helpful feature when dealing with slow network connections.

These options do not affect the "RESOURCE.FRK" folder. For more information on the RESOURCE.FRK folder, see the end of this chapter.
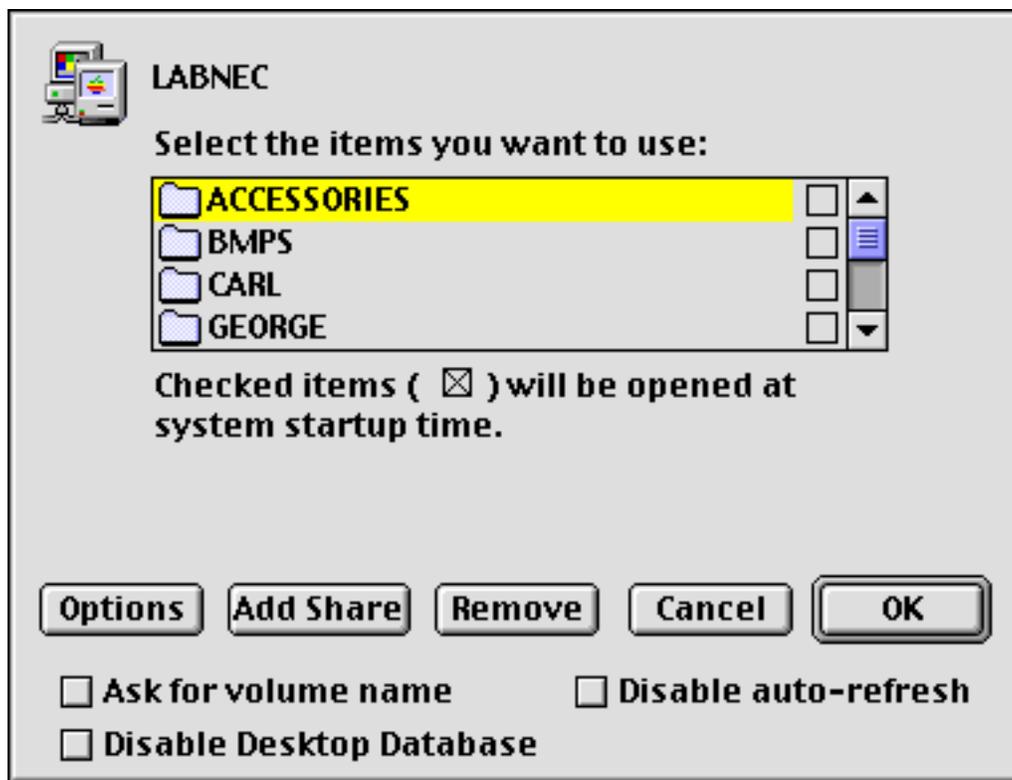
Figure 5-10: Shared Resources Options

Unmounting Resources

To unmount a DAVE resource simply drag the resource icon into the trash. Alternatively you may select the DAVE share and choose "Put Away" (command-Y) from the File menu.

Using Aliases

Making aliases on DAVE is just like making aliases for other files and folders in the Finder. After selecting the volume you wish to make an alias from, choose Make Alias from the File menu.

Using an Alias to Automatically Mount a Shared Resource

You can make an alias for a shared resource so that you can mount the volume without having to use the Chooser every time to mount it. Mount the resource using the Chooser, select the resource icon on the desktop, and choose Make Alias (command-M) from the File menu. An alias for the shared resource will appear on your desktop.

NOTE: The alias will not appear on the desktop of any other Macintosh that has mounted the shared resource.

Whenever you wish to mount the shared resource double-click the alias icon. DAVE will prompt you for your password and mount the volume after the correct password is entered. The shared resource can also be mounted by dropping a folder or file onto the alias icon.

Apple's Apple Menu Options control panel creates a folder called "Recent Servers". An alias for DAVE volumes will appear in this folder under the Apple Menu after they have been successfully mounted. Selecting this alias from the Recent Servers folder under the Apple Menu mounts and opens the DAVE volume.

Using Private Aliases on Your Desktop

When you make aliases of items on a shared resource the alias is created in the same folder as the original item. If you drag the alias to your desktop an alias copy will be created on your start-up disk.

Changing DAVE Client Settings

To change your Client settings open the Chooser from the Apple menu and select the DAVE Client icon. Click the "Setup" button, the DAVE Client Setup dialog will then display.

Figure 5-11: DAVE Client Setup

By default DAVE only lists the servers in your workgroup. You can customize your server listing by adding and removing servers on the list. Other options in the DAVE Client Setup window include forcing DAVE to ask for the volume name, disabling the desktop database, Browse Services and selecting applications for opening non-Macintosh text (*.txt) files.

Making a List of Commonly Used Servers

If you work with only one or two servers you may wish to add them to the commonly used servers list. When doing this you will probably want to turn off the "Browse Services" check box. When "Browse Services" is turned off the Chooser will display only the servers you added manually. This makes using DAVE faster when you have many servers on your network, or when your network is slow.

You may need to add servers to the server list if they do not appear in the Chooser. By default only the servers in your workgroup will automatically appear. You can add servers from other workgroups so that they automatically display in the Chooser. This saves you from searching the entire network every time you wish to mount servers from other workgroups. You can also add servers listed in your LMHOSTS file. This is helpful if those servers are in a different subnet from your Macintosh. To add a server to the list click the "Add" button, type the name of the new server in the provided field and click the "OK" button. To remove a server from the list, simply select the server and click the "Remove" button.

You may also add a commonly used server by its IP address. This allows you to browse the resources of a server without having to know the NetBIOS name of that server. This is also helpful in Mac to Mac connections and over-the-Internet scenarios too.

Naming Mounted Resources

You cannot change the name of a DAVE shared volume the same way you change the name of a local disk or floppy. Instead you can assign any name to the volume if you use the "Ask me for volume name" check box in the DAVE Client setup window.
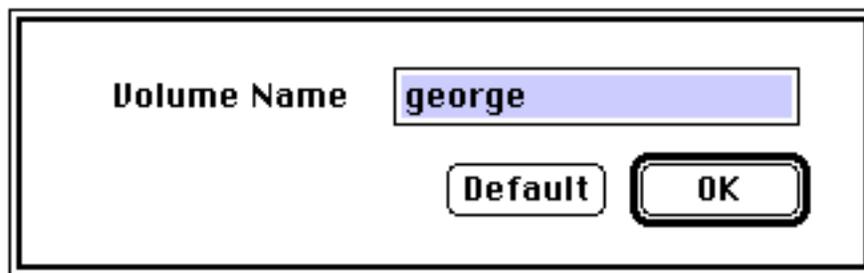
Figure 5-12: Naming a Mounted Volume

When you select the "Ask me for volume name" check box DAVE will ask for a volume name the next time you try to mount the shared resource. Type the name of your choice and click the "OK" button. If you make an alias for a named volume the name will be remembered when you use the alias.

Browse Services

You can prevent DAVE Client from building a list of servers by turning off the "Browse Services" check box in the DAVE Client setup window. If the "Browse Services" check box is selected DAVE will use the Master Browser or the Primary Domain Controller (PDC) to search for servers. If the "Browse Services" check box is turned off the only servers that will display in the Chooser will be those you added manually. This will also cause the "Entire Network" item to disappear.

Choosing an Editor Application

The "Editor" button in the DAVE Client Setup dialog selects the default application for opening text (*.txt) files. When you double click a file in a shared resource DAVE Client will first verify whether or not it is a Macintosh file. DAVE will check for type and creator information. These are 4-character "signatures" which the Finder uses to link files and applications on a Mac. If it is a Macintosh file it will be opened with the application it was created in. If it is not a Macintosh file DAVE Client will search for a match using the PC Exchange preferences. If both of these methods fail and the file ends with ".txt" DAVE Client will open the file with the Editor chosen. DAVE Client uses SimpleText as its Editor default. You can change the application by clicking the "Editor" button and browsing your directories for the application of your choice. Microsoft Word or BBEdit are common editors. Select the application and click the "Select" button. The name of the chosen application will appear next to the "Editor" button.

Determining Your DAVE Client Version

To determine your DAVE Client Version, open the Chooser from the Apple menu and click the "Setup" button. The version of DAVE Client is displayed at the top of the DAVE Client Setup dialog.

Using the Trash on a Shared Resource

After mounting a shared resource and double clicking on the resource icon a window with the files on the shared resource will display. To delete a file on a shared resource drag it to the trash on your desktop. If you dismount the shared resource before emptying the trash a folder will be created on the server within the mount point. This folder will be named "TrashFor[your NetBIOS name]". When you remount the same share point your trash will fill up. Empty the trash and the "TrashFor[your NetBIOS name]" folder will be deleted from the server.

RESOURCE.FRK Folder

The Macintosh file system is based on two "Forks". There is the "Data Fork" and there is the "Resource Fork". On file systems like FAT which do not support multi-forked files the Finder needs a place to store resource information. To facilitate this DAVE creates a hidden folder on the DAVE share called "RESOURCE.FRK". This folder is used to keep the resource information for every file in the enclosing folder. If you copy a file using DAVE the link between the resource and data forks is handled automatically. If you copy a file using a CIFS client which does not support multiple forks only the data fork is copied. While Macintosh applications are usually primarily resources, their data files (documents) tend to be primarily data. Depending on the program the resource fork is only used for Macintosh specific information.
Some file systems like NTFS can handle multiple forks and DAVE is able to use these file systems' capabilities directly.

Chapter 6

DAVE Server

DAVE lets you share your files and a PostScript printer with other CIFS networking clients such as Windows 95, Windows NT, and DAVE. With the DAVE Server installed on your Macintosh computers Microsoft clients will be able to see DAVE Server resources in their Network Neighborhood. Macintosh computers will able to see DAVE Server resources in the Chooser. The DAVE Server components are installed by default by the DAVE Installer. For more information on the DAVE Installer, please see chapter 2.

Required Components

The DAVE Server consists of three parts:

- DAVE Server - A background application located in the Startup Items folder.
- DAVE Server Setup - A control panel.
- Shutdown DAVE Server - An application located in the Shutdown Items folder.

Each component needs to be in a specific location in your System Folder in order to function properly. The DAVE Installer will put these files in the correct location for you.

DAVE Server

The application DAVE Server is the heart of the DAVE Server, the component that does all of the work. It is a background only application and does not appear in the Application menu or the Finder's About window when it is running. You can confirm that DAVE Server is running by checking the "File and Print Services" radio button in the DAVE Server Setup control panel. The default memory partition for the DAVE Server is 1000K. You can use the Finder's Get Info command to increase the memory allocated to it.

Figure 6-1: DAVE Server Icon

As a background application, DAVE Server does not have a user interface. To make changes to the configuration of DAVE Server, use the DAVE Server Setup control panel.

DAVE Server Setup

DAVE Server Setup is a control panel. This is where you will configure the DAVE Server. This is also where you can view current status of the DAVE Server.
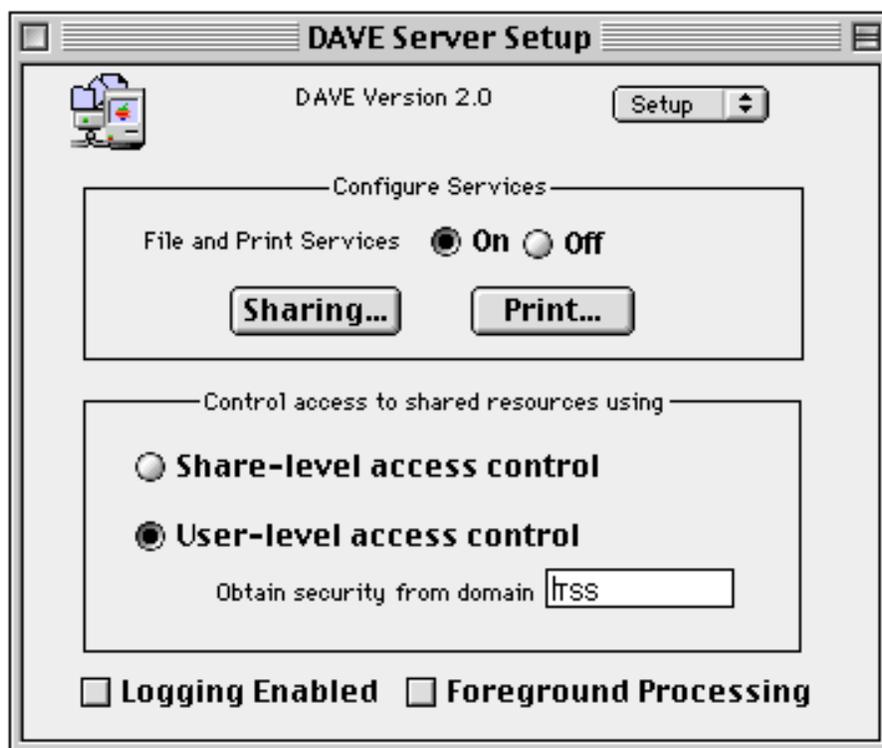
Figure 6-2: DAVE Server Setup control panel

To turn DAVE File Sharing on, click the "On" radio button under the Configure Services section. This requires the DAVE Server application to be in the Startup Items folder.

Warning - Shutting down the DAVE Server without properly notifying attached users to save their work and disconnect may result in loss of data. If no users are connected to your Macintosh no warning is issued.

Share level/User level Access Control

Before sharing anything for the first time, you should decide if you want "Share-level" or "User-level" access control for security. With Share-level access control, you can assign a "Read-Only" password, a "Read-Write" password, or "Both" passwords for each folder that you wish to share. Users wishing to use the shared resources will need to know the correct password for each resource. For User-level access control, DAVE Server uses an Windows NT domain's list of users for authentication. Users must have accounts in the domain before they can use resources on your Macintosh. To change between access control modes, click the appropriate radio button in the "Control access to shared resources using" section of the control panel. Switching between modes will stop sharing and all sharing cofigurations will be removed.

Figure 6-3: Access Control Warning

If you select User-Level, then you will need to provide the name of your security provider. This is usually the name of your current domain. Enter this into the "Obtain security from domain" field.

DAVE Server Setup - Share level Sharing

To share a folder so that CIFS clients can use it, you must first open the DAVE Server Setup control panel. Click the button labeled "Sharing…" to bring up the dialog listing of your shared folders.
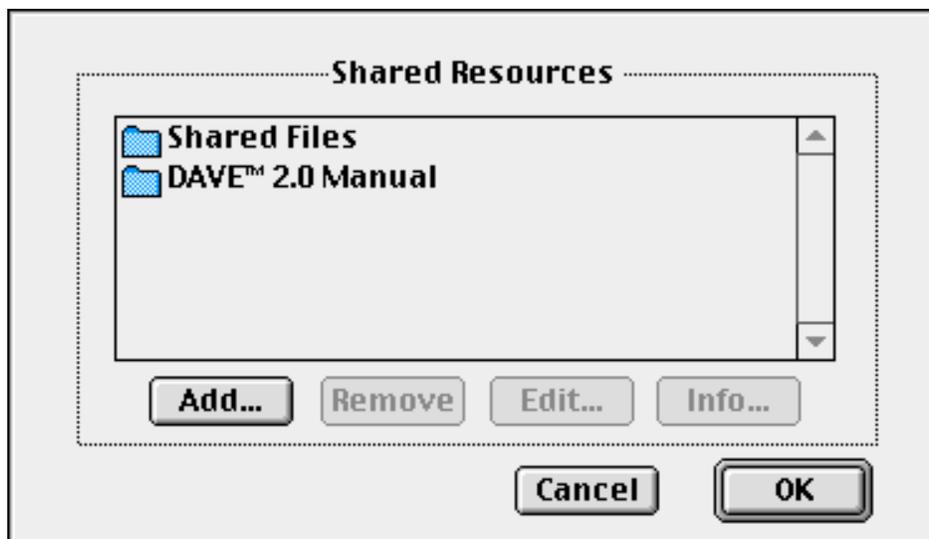
Figure 6-4: Shared Resources

Click the "Add…" button and "Select" the folder from the dialog. Now choose the password(s) to protect your shared folder. The pull-down menu in the lower left-hand corner of the password window lets you choose which authentication password(s) you wish to use. If you choose "Read-Only", users can view files but not make changes. If you choose "Read-Write", users can view and make changes to files on your Macintosh. If you choose "Both Passwords", users will have rights depending on which password is entered when connected to your shared resource.

Figure 6-5: Share-level security

You can leave either password blank. This will allow the user to connect without having to type in a password. However, some CIFS clients may implicitly try a blank password and be granted access without ever asking the remote user. In the "Share As" field, enter the name for this share which you want other users to be able to see. You should limit the name to 12 characters so that all CIFS clients can use it. When you click OK, you will return to the Shared Resources dialog. After confirming your changes, the folder will be available to other users.

To make a change to the shared resource select the share name in the Shared Resources dialog and then click the "Edit…" button. This will return you to the previous security screen where you can edit the security information again. Click "OK" to return to the Shared Resources dialog.

To stop sharing a folder select the shared name in the Shared Resources dialog and then click the "Remove" button. After confirming your action the folder will no longer available to other users.

You can click on a share and then click on the "Info…" button to view information about that share. This will show you the folder's real name, the share name, and the number of current connections. If the number of connections is more than 0, share is in use. Be careful, making changes may effect other users. To confirm changes and return to the DAVE Server Control Panel, click OK on the Shared Resources window.
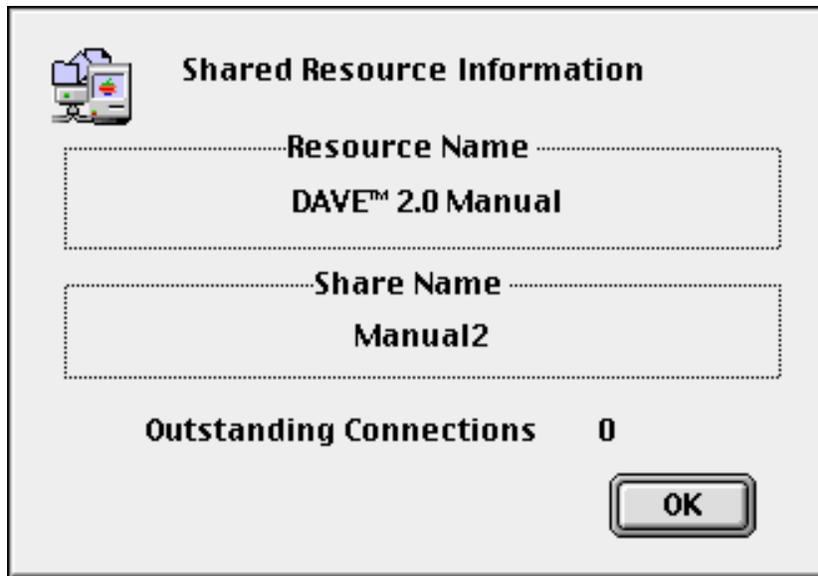
Figure 6-6: Share info

User-level Sharing

To share a folder so that Domain authenticated CIFS clients can use it open the DAVE Server Setup control panel and make sure the radio button is set to "User-level access control" and the Domain name is entered into the field marked "obtain security from domain". Click "Sharing…" to bring up the list of shares. Click "Add…" to select the folder that you wish to share and then click the "Select Button". If you are not currently logged on to your domain, you will be prompted for your username and password. DAVE Server needs this to get the list of users and groups from your domain.

You should now see a dialog containing the list of users and groups from your domain on the left and a list of users who have permission to use your share on the right. At the top of the screen, you can edit the name of the share as you wish it to be seen by other users.
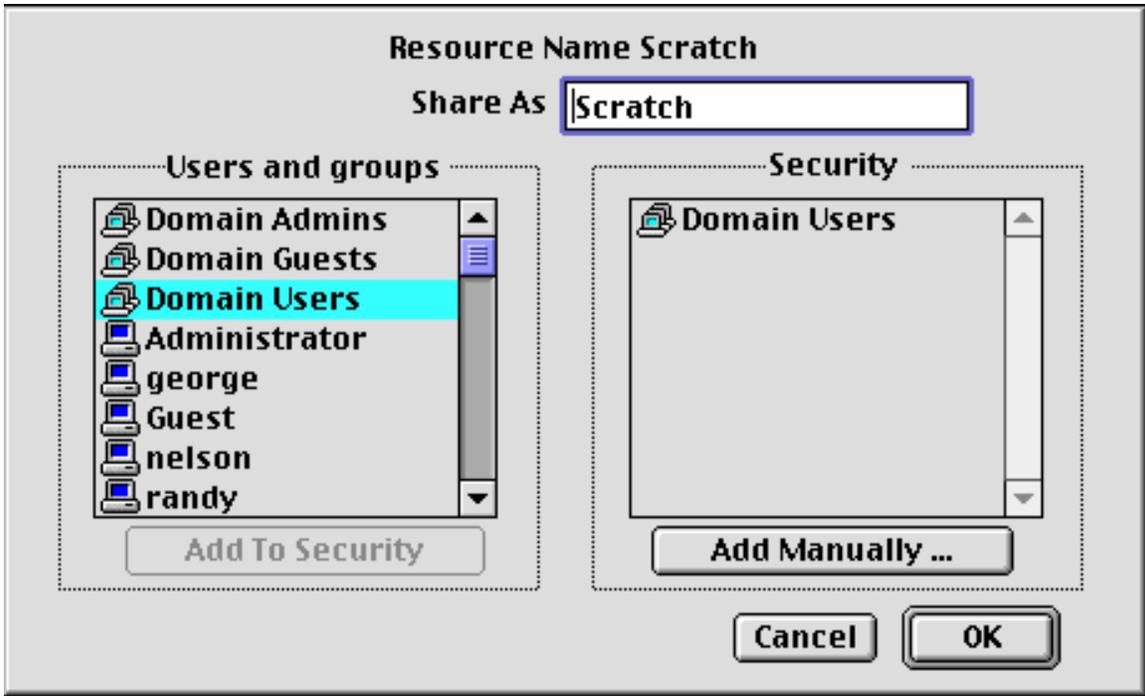
Figure 6-7: User-level security

To give a user or group access to your shared folder, click on the name and then click the "Add to Security" button. Their name will appear on the right side, allowing the user to use the resource on your Macintosh.
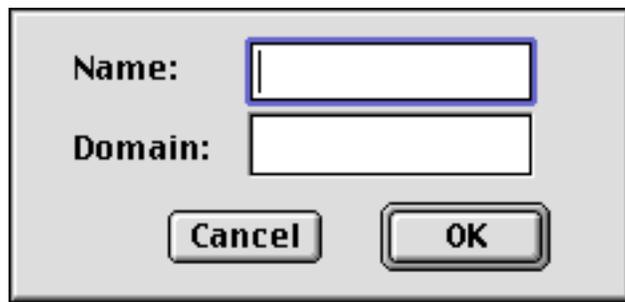
Figure 6-8: Add Manually

To manually add a user you will need to know the user's Username and domain name. This will allow you to authenticate against trusted domains. From the security window, click the "Add Manually" button. Enter the user's Username and Domain name. Click "OK" to save that user.
When done adding users, you must click OK to save your changes.

To remove a user simply click on their name, the "Add Manually" button will then change to a "Remove User" button. Clicking on this button will then remove the user.

Sharing a PostScript Printer

Using DAVE you can share one printer at a time with other CIFS clients. This printer must support PostScript and be visible to the Apple LaserWriter driver in the Chooser via

AppleTalk. From the DAVE Server Setup Control Panel click on the "Print…" button. This dialog shows the name of the currently shared PostScript printer. To begin sharing a printer, click the "Add…" button. If you already have a printer shared, the Add… button will be replaced by an "Edit…" button.

Figure 6-9: Share a Printer

Click on the "Add…" or the "Edit…" to bring up a list of available printers on your network. You may change zones from the pull-down menu at the bottom of the dialog. Choose the printer which you wish to share. After selecting your printer you may assign security for that printer. This is done using the same method as security for folders, with one exception; the printers cannot be Read-Only.

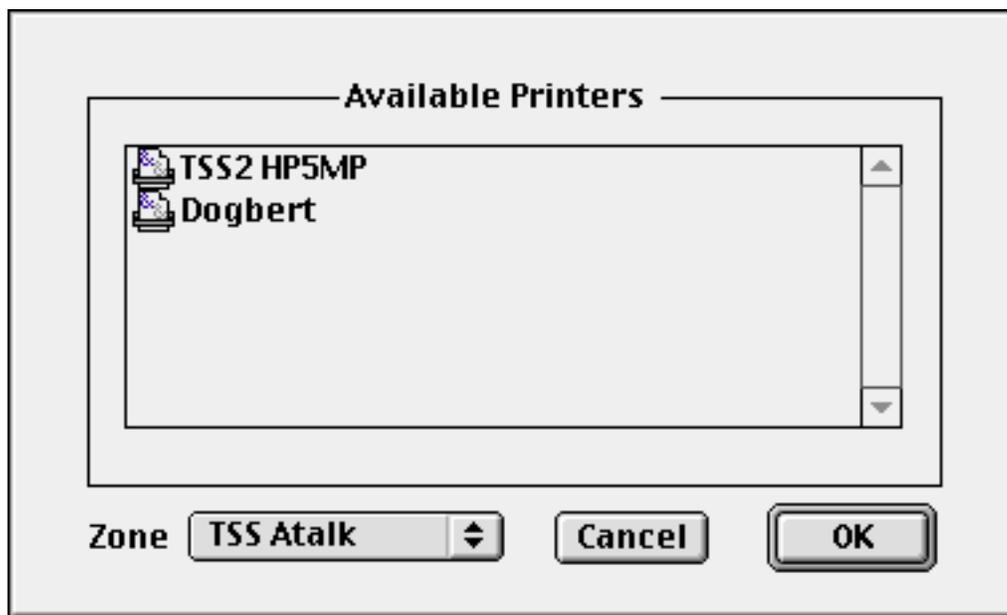*Figure 6-10: Choose a Printer*

To stop sharing a printer use the "Delete" button. This will make that printer no longer available to CIFS clients via your computer.
Click OK to save your changes. Your printer is now shared for use by CIFS clients.

When CIFS clients print to your shared printer, the print job will spool to the "DAVE Print Spool" folder located in your Preferences Folder. Each print job will have a unique name in this folder. Deleting a file from this folder will cancel the print job.

DAVE Server Status

To find out if you have any users connected to your DAVE Server shares you can use the DAVE Server Status. At the DAVE Server Setup control panel main window choose "Status" from the pop-up menu in the upper right-hand corner. Next you will see a listing of each computer and user connected to your computer.
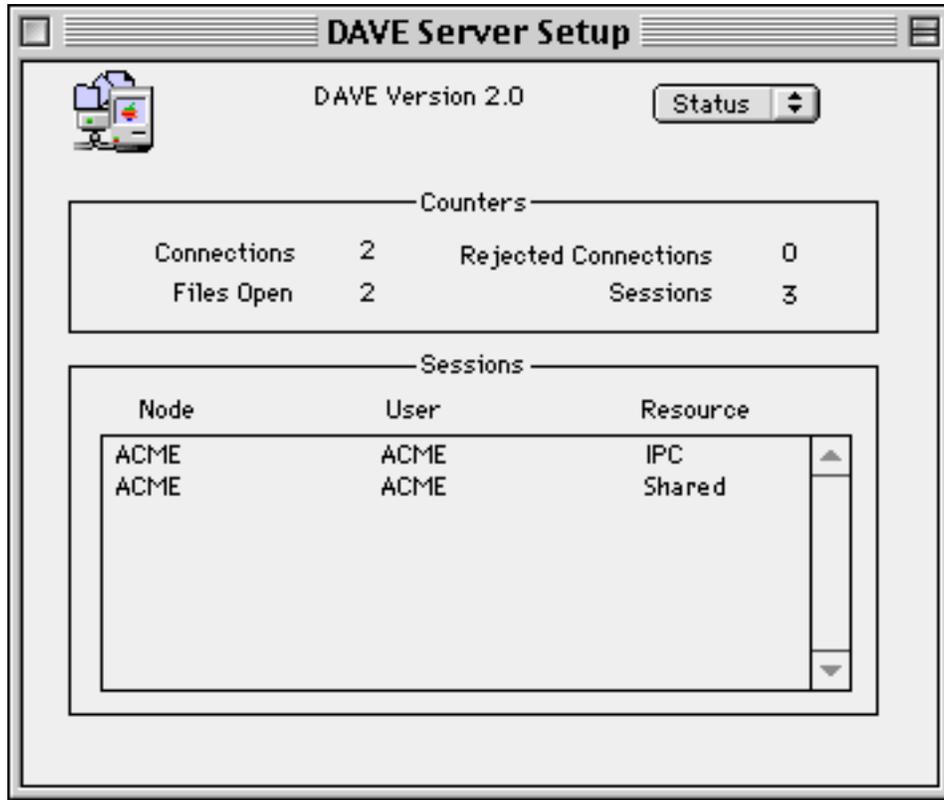
Figure 6-11: Server Status

☐ Logging Enabled

When checked the "Logging Enabled" option will tell DAVE Server to create a text file called "DAVE Log" in your SystemFolder. This file will contain a log of connections and disconnections from the DAVE server. It can be used for troubleshooting the DAVE server and for just seeing who is using resources on your Macintosh.

```
Node BUSTER          started a session on Wed Sep 10 14:30:21 1997
Node BUSTER          stopped a session on Wed Sep 10 14:30:23 1997
```

The file can be opened by SimpleText or any other application which can read fixed width text files.

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☐ Foreground Processing

The "Foreground Processing" option tells DAVE Server to yield less processor time to other Applications running on your Macintosh, and as a result CIFS clients using your Macintosh's resources will get better response time.

Shutdown DAVE Server

Shutdown DAVE Server is a small application which tells the DAVE Server to quit gracefully. The normal location of Shutdown DAVE Server is in your Shutdown Items folder, in your System Folder. When you shutdown your Macintosh, the finder will run Shutdown DAVE Server. When this happens, Shutdown DAVE Server will check to see if your Macintosh is being shared over the network. If so, a dialog will give you a chance to wait a specified number of minutes before quitting so you can notify users to disconnect before you shutdown.
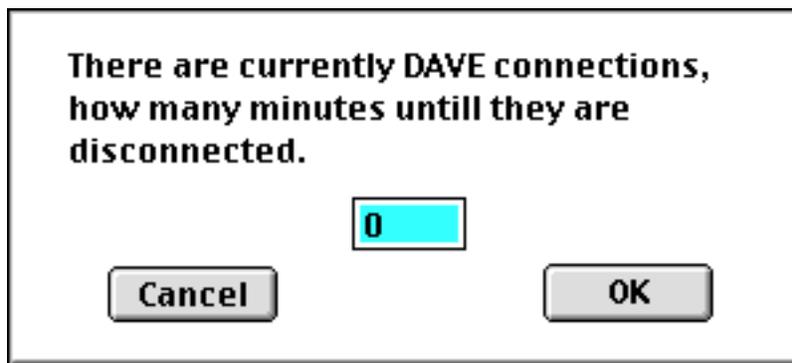
Figure 6-12: Shutdown DAVE Server Warning

Type and Creator Information

When Non-Macintosh users access a DAVE Server and create files, those files files will not have the Macintosh Finder information needed to properly display the files's icon. When a file is saved onto a shared DAVE volume on a Macintosh, the DAVE Server will add the correct type and creator to the file by looking up its extension in the PC Exchange Preferences file. If there is no entry in PC Exchange for an extension, then DAVE Server give that file a generic PC icon by setting the type to "TEXT"and the creator to "dosa". For more information on PC Exchange, please see Appendix F in this manual.

The Microsoft Sound.WAV

Figure 6-13: Generic icon

Important NOTE to DAVE v1.x users:

If you are using DAVE v1.x and you attempt to connect to a Macintosh running DAVE v2.0 you will receive the following error message:
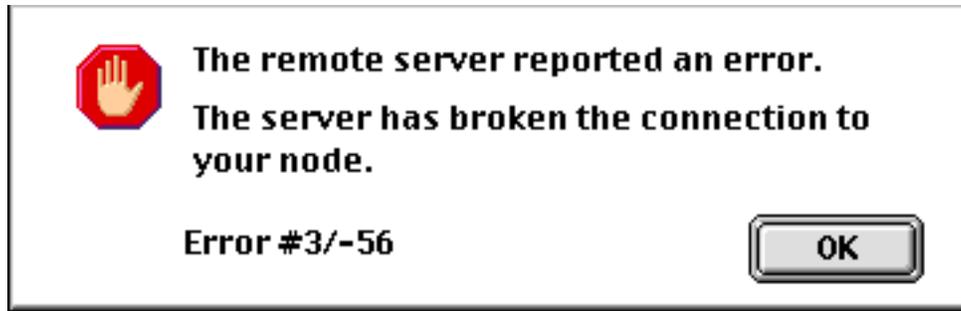
Figure 6-14: DAVE 1.x - 2.x error

In order to connect your Macintosh to another Macintosh using DAVE you will need to upgrade both computers to DAVE v2.0. For further information on upgrading your current version of DAVE please see chapter 2 of this guide.

Chapter 7

DAVE Print Client

DAVE enables Macintosh users to print to shared printers on a Microsoft network. There are two methods of mounting a shared printer resource. The first method is via the Chooser under the Apple menu. The second is via the DAVE Print Client in the Control Panels item under the Apple menu. While the first method will list available shared printer resources and is easier to use, the second method allows users to edit their printer specifications. These methods are explained on the following pages.

Selecting a Shared Printer Resource From the Chooser

To mount a shared printer resource using the Chooser, you must first select a server from the server listing in the Chooser. For instructions on selecting a server in your workgroup, see chapter 6. After following the instructions in Finding Other Computers on the Network and Mounting Shared Resources, return to this section and continue.

Now that you have selected a server, a dialog similar to figure 7-1 will display. If the printer icons in the Shared Resource listing are grayed out, the DAVE Print Client is not installed. Please review the Installation chapter of this manual.
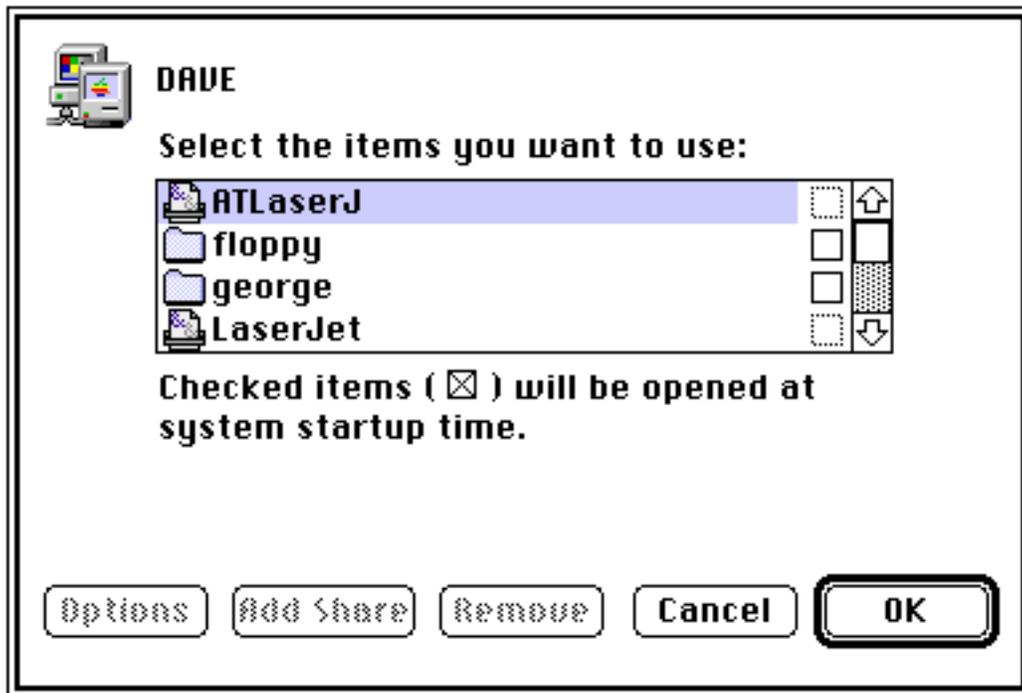
Figure 7-1: Shared Printer Resources

Double click the preferred printer from the Resource listing or select it and click the "OK" button. If the server is using shared level security, you may be prompted for a password. Type your password in the designated field and click "OK". If you do not know your

password, ask your Systems Administrator. A dialog asking for Printer Name and PPD verification will display (see figure 7-2).
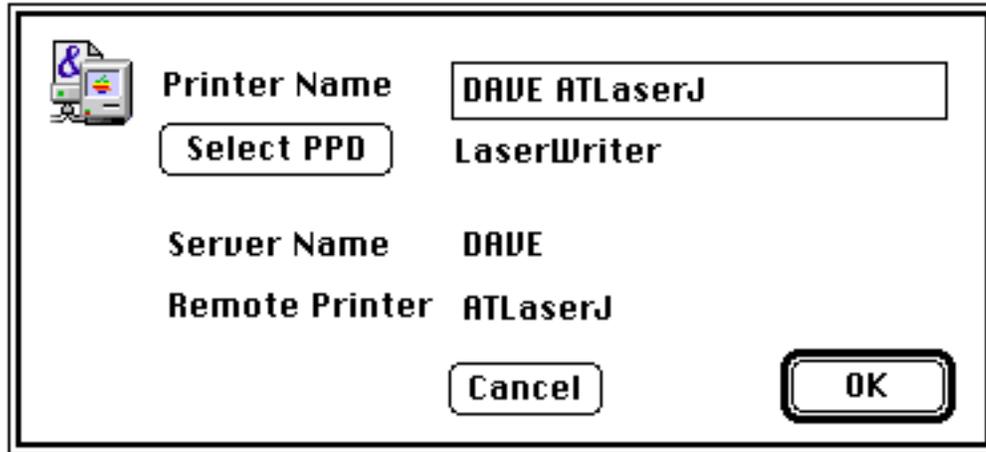
Figure 7-2: Printer Verification

If the default PostScript Printer Description (PPD) is not correct, click the "Select PPD" button. A Printer description dialog will display (see figure 7-3). Select the appropriate PostScript printer description and click the "Open" button. If you are unsure of the correct PostScript printer description, ask your Systems Administrator.
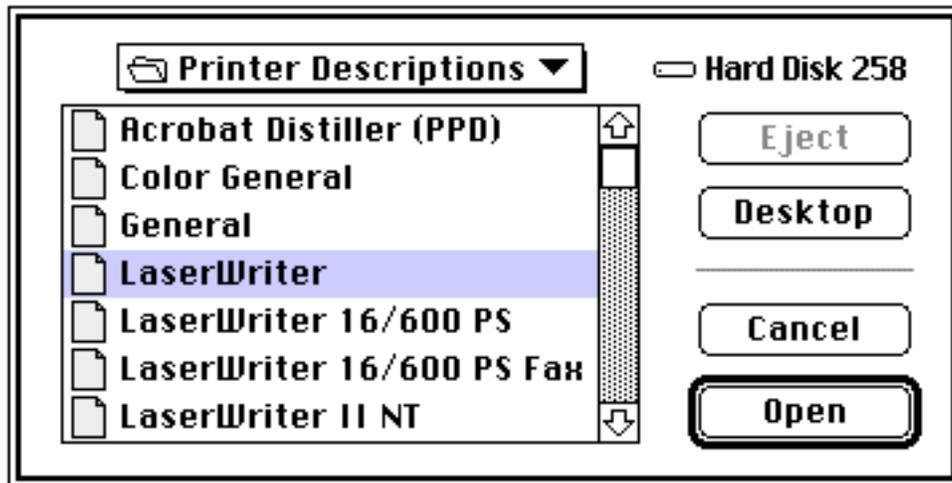
Figure 7-3: Printer Descriptions

The PostScript Printer Description dialog will close and you will return to the Printer Verification dialog. If the Printer Name and the Printer Description are correct, click the "OK" button. The Printer Verification dialog will close and you will return to the Chooser. You have now mounted a shared printer resource. To select your new printer, turn to the "Determining Your Computer's Current Zone" section later in this chapter.
NOTE: After mounting a shared printer resource a Printer Resource Icon will not display on your desktop.

Selecting a Shared Printer Resource From the DAVE Print Client

The DAVE Print Client enables you to add new printers, edit print gateway settings, and remove print gateways. To open the DAVE Print Client, select the DAVE Print Client item from the Control Panels item under the Apple menu (see figure 7-4).
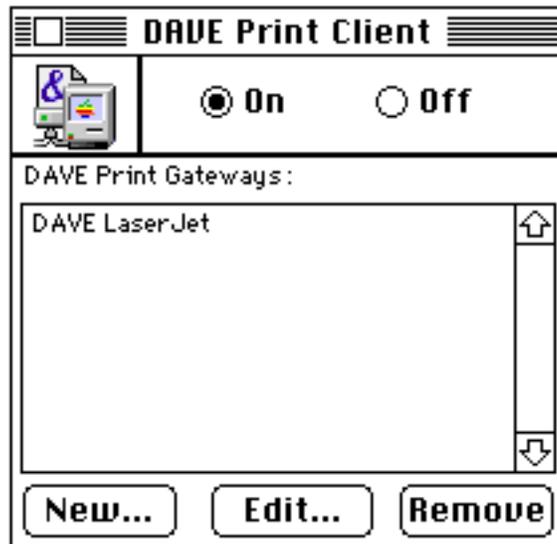
Figure 7-4: DAVE Print Client control panel.

DAVE Print Client On and Off

To set the Print Client state use the "On" and "Off" selections.

Removing a Print Gateway

To remove a Print Gateway select it and click the "Remove" button.

Editing a Shared Printer Setup

To edit a shared printer's settings select the shared printer you wish to edit and click the "Edit" button on the DAVE Print Client control panel. The Edit Shared Printer Settings dialog will display (see figure 7-5).
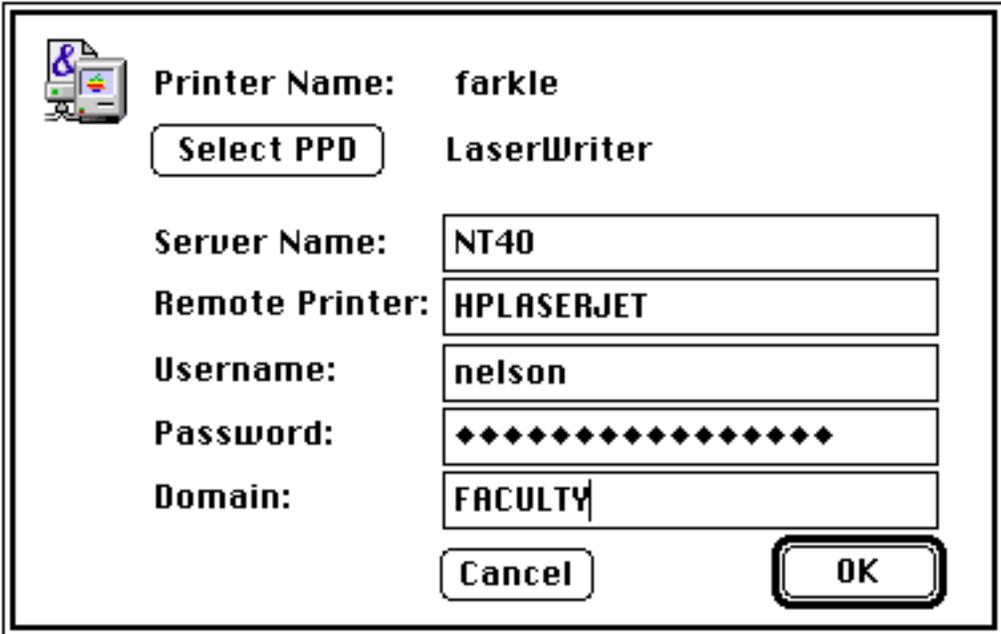
Figure 7-5: Edit Shared Printer Settings

Edit the settings and select "OK". If you have entered the correct information, the dialog will close and you will return to the DAVE Print Client control panel. If you are unsure of the correct settings, ask your Systems Administrator.

Adding a Printer

To add a printer gateway, click the "New..." button on the DAVE Print Client control panel. A dialog (see figure 7-6) will prompt you for information about the printer you wish to add.
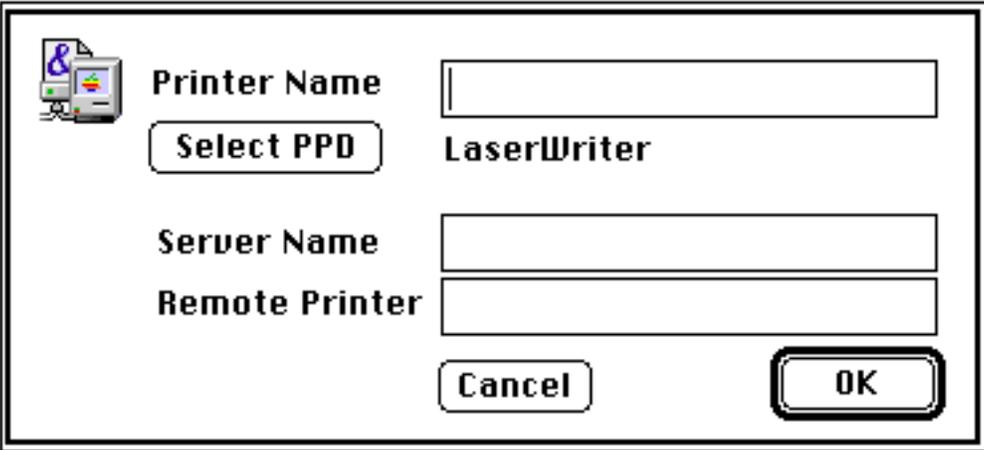
Figure 7-6: New Printer Specifications

Type the Printer Name in the "Printer Name" field. The Printer Name is the name that will appear in your Print Gateway. You can type any name you prefer but it should be descriptive and it must not be a name already in use on your network. Type the name of the remote server in the "Server Name" field and the name of the remote shared printer in

the "Remote Printer" field. If you do not know the information for these fields, ask your Systems Administrator or try adding the printer via the Chooser.
If the default PPD is not correct, click the "Select PPD" button and choose the correct PostScript Printer Description (see figure 7-7). If you are unsure of which PostScript Printer Description is correct, ask your Systems Administrator.
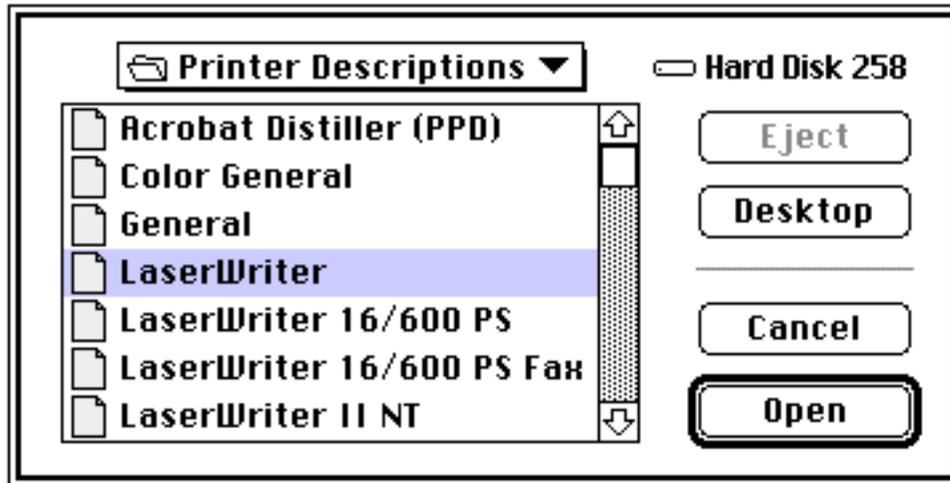
Figure 7-7: PostScript Printer Descriptions

Click the "Open" button and you will return to the New Printer Specifications dialog.
Now that you have typed the requested information and selected the correct PPD, click the "OK" button. If you have entered a printer name that is already in use on your network, an error message will display (see figure 7-8).
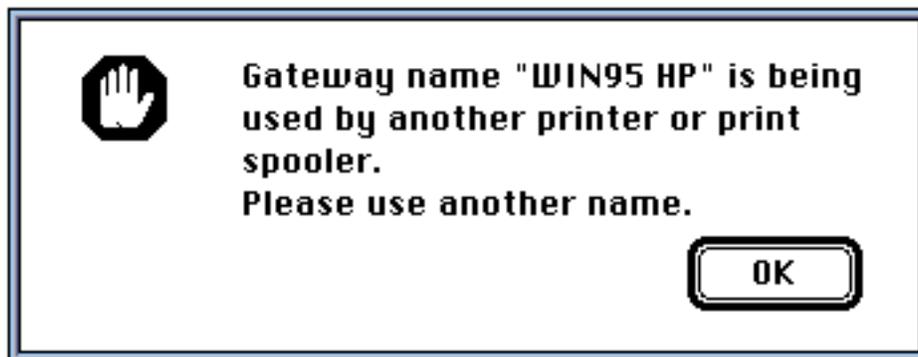
Figure 7-8: Printer Name Error

The printer will now appear on your AppleTalk network and will be broadcast to other Macintosh computers in the local zone. If you want to allow other Macintosh computers to print on your gateway check the box "Allow AppleTalk access by other users." If you do not want to use the AppleTalk protocol on your network you will need to install Apple's Remote Only. For more information see Appendix F.

Click "OK" and type a name in the "Name" field that is not already in use. After typing a new name, click "OK". If the remote server is using shared level security, you may be prompted for a password (see figure 7-9).
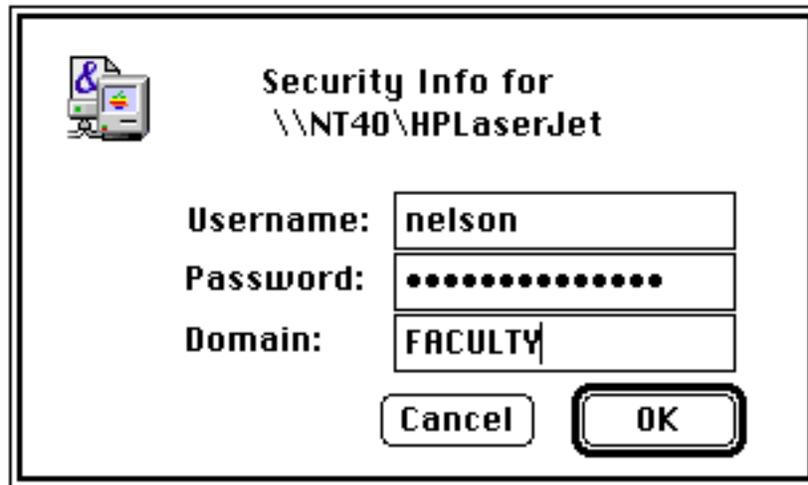
Figure 7-9: Security Entry Dialog

Type your username, password and domain and click "OK". If you do not have a Primary Domain Controller (PDC), leave the domain field blank. You will return to the DAVE Print Client Control Panel.
NOTE: After mounting a shared printer resource a Printer Resource Icon will not display on your desktop.
Close the DAVE Print Client control panel. Now you are ready to select your new printer. To select your printer, continue with the Determining Your Computer's Current Zone section.

Determining Your Computer's Current Zone

Before selecting your printer from the Chooser, you must first determine your computer's current zone.
If you are using MacTCP, select the Network item from the Control Panels under the Apple menu (see figure 7-10). Your computer's current zone will be displayed in the pull-down menu marked Current Zone.
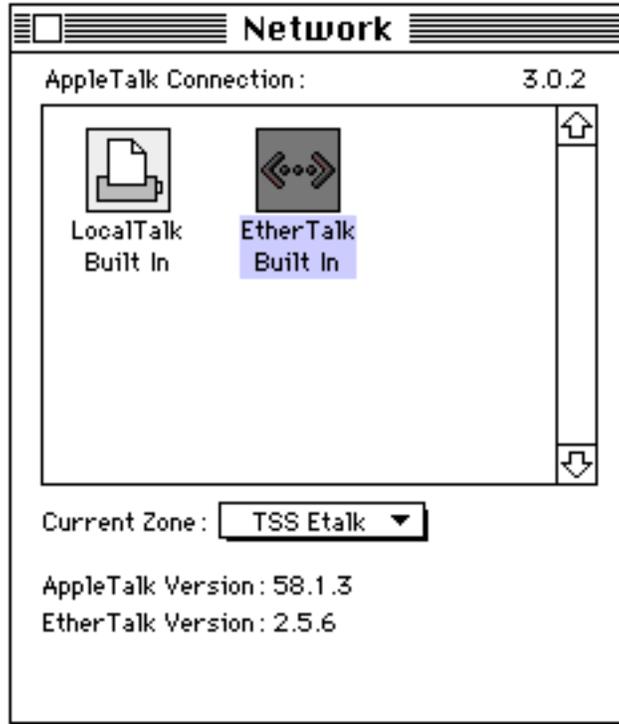
Figure 7-10: Network Control Panel

If you are using Open Transport, select the AppleTalk item from the Control Panels under the Apple menu (see figure 7-11). Your computer's current zone will be displayed in the pull-down menu marked Current Zone.
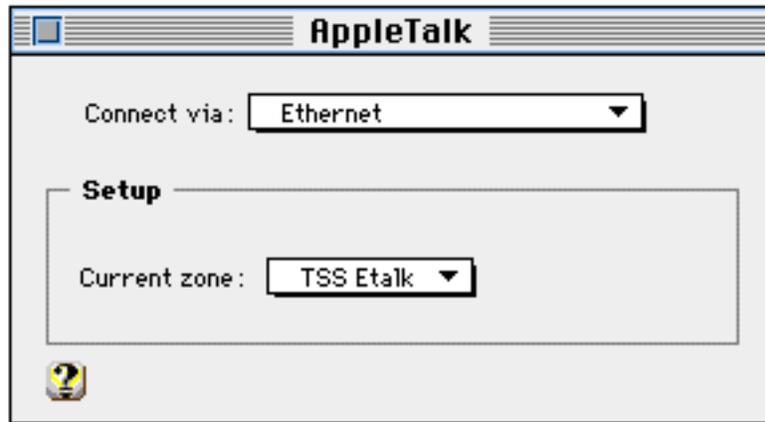
Figure 7-11: AppleTalk Control Panel

Selecting Your New Printer

Now that you have mounted the shared printer resource, you can choose the printer you wish to use. To do this, open the Chooser from your Apple menu (see figure 7-12). Select a LaserWriter icon and then choose your computer's current zone from the

AppleTalk Zone listing. After selecting your computer's current zone, a list of PostScript printers, including the printer you just added, will display in the "Select a PostScript Printer" listing.

NOTE: Use LaserWriter 8.3.4 or later for best results. Some older LaserWriter drivers do not support the Adobe Document Structuring Conventions Standard.
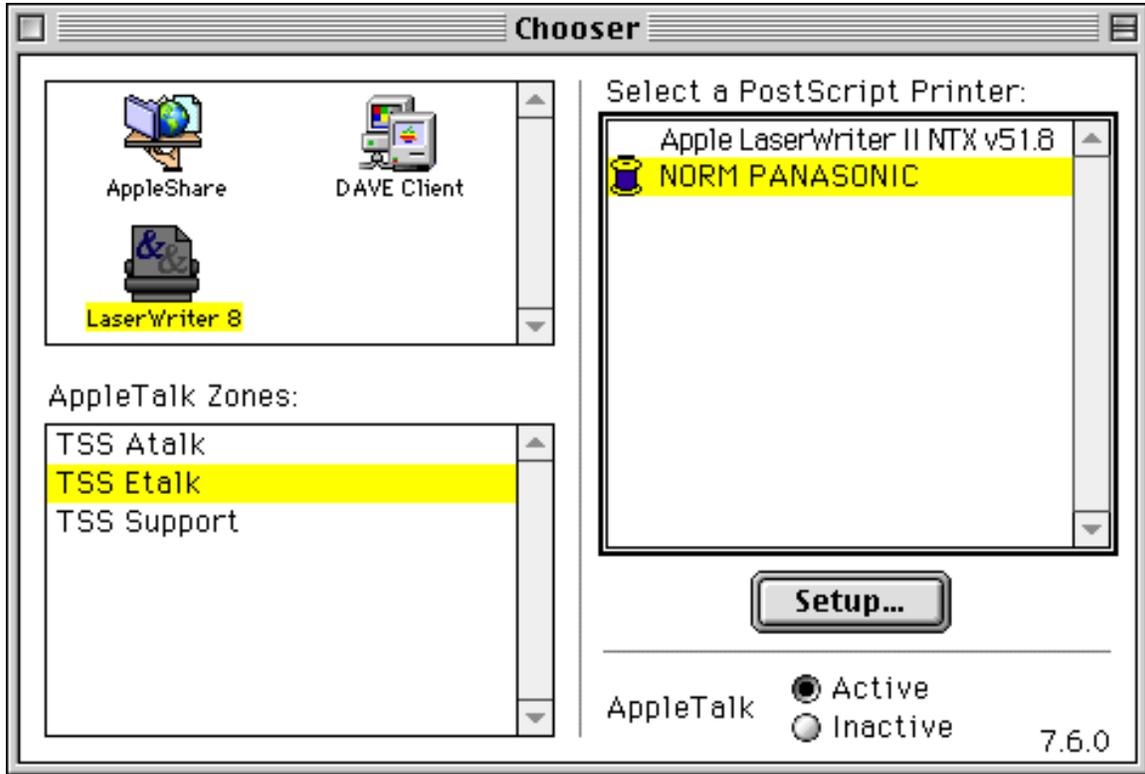
Figure 7-12: Selecting a Printer

After selecting your new printer, close the Chooser. You can now print to your chosen printer. To change your printer, simply repeat the directions in this section.

Chapter 8

Technical Information

Client Technical Information

This chapter is a technical overview of DAVE. It is intended to provide users and Systems Administrators with information about how DAVE works.

The Macintosh Technical Information section deals with information specific to the Macintosh system.

The Server Technical Information section deals with information about and the differences between Windows NT, Windows 95 and Windows for Workgroups that is relevant to the DAVE Client and DAVE Access.

All NetBIOS Technical Information can be found in the NetBIOS Control Panel chapter of this manual.

How DAVE Client Works with the Mac OS File System

DAVE requires the Apple File System Manager extension. The File System Manager is the part of the Mac OS that manages the use of foreign file systems. DAVE, a foreign file system, allows Macintosh applications to gain access to non-Macintosh volumes using the File Manager. The File System Manager provides a general means by which foreign file systems can be installed, identified and interfaced on the operating system. The File System Manager is provided by Apple and is licensed by TSS. Macintosh OS 7.5.x ships with File System Manager as part of the operating system.

How DAVE Client Works with NetBIOS

DAVE Client uses the NetBIOS driver, which runs over Open Transport or MacTCP, to move data between the Macintosh and Windows machines. NetBIOS broadcasts for a Master Browser or a Primary Domain Name Controller (PDNC) and uses the first to respond to find computers in the network and to get a list of other workgroups.

How DAVE Client Stores Apple Files

Apple files have a different structure than files found on Microsoft systems. Windows 95, Windows for Workgroups and some NT machines support a File Allocation Table (FAT) file system. Apple machines support AppleDouble format, a standard developed by Apple Computer, Inc. DAVE uses the AppleDouble format.

AppleDouble format places the Apple data fork in the named file and places its resource fork and finder information in a file with a duplicate name located in a folder called resource.frk. This folder is created automatically and is located in the same directory as the named file.

Some Windows NT machines support a file system called New Technology File System (NTFS), which supports Macintosh files. On these systems, Macintosh files will be stored in the NTFS format and will be accessed using streams.

Name Translation

Apple files have different naming conventions than Windows files. Because DAVE supports all valid Apple file names, users will not notice any difference between Windows volumes and local disk volumes. For users that access Windows files, DAVE performs some translations.

The DAVE Client uses two forms of filename conversions. If the server supports unicode, DAVE Client will use it. All NT machines support unicode, but Windows 95 and Windows for Workgroups server machines do not. DAVE Client will convert certain known illegal characters for these machines. The illegal characters will be translated to a percent character followed by two characters that are the ASCII representation of the hexadecimal value.

Apple file names can only contain 1 to 31 characters. DAVE will use the DOS short name for Windows file names exceeding 31 characters.

Dragging Items to the Desktop

When dragging an item from a shared resource to your desktop, DAVE Client will copy the file to the start-up volume's desktop.

Desktop Database Information

The DAVE Client creates a Macintosh desktop database folder on the remote server called DesktopFolderDB. This database contains icon information about application icons and application directory paths for Macintosh applications that reside on the server.

If an application path is changed from the directory where it was originally stored, the path information will be lost. To remedy this problem, rename the application to a temporary name and then back to its original name. This will restore the path information.

If the DesktopFolderDB folder begins to get very large, it is because many Macintosh applications have been copied to the server. This folder can be deleted, but all the desktop database information will be lost.

Copying Macintosh Files From Server to Server

When copying files using DAVE from one Windows NT volume using the NTFS file system, to another Windows NT volume using the NTFS file system, the Macintosh file structure will be retained. When copying a Macintosh file from one Windows NT volume using the FAT file system to another, remember to copy the datafork file and the resourcefork file. The resourcefork file has the same name as the datafork file, but is located in the current directory in a folder called resource.frk. If there is not a folder called resource.frk on the destination directory, you will need to create one. After copying the datafork file to the destination directory, copy the resourcefork file to the new resource.frk folder.

NOTE: You cannot copy Macintosh files from a Windows machine with a FAT file system to a Windows machine with NTFS or vice versa unless you use a Macintosh to do the file copy. The Macintosh will correctly handle the datafork and resource fork files.

Sending messages to a Windows Server

In order for a Windows 95 server to receive messages sent with DAVE Access, the WinPopup application must be running on the computer. In order for a Windows NT server to receive a message sent with the DAVE Access, the Messenger Service under the Services Control Panel must be started.

Further Reading

X/Open CAE Specifications - Protocols for X/Open PC Interworking: SMB, Version 2

CIFS online information can be found at http://www.cifs.com and at http://www.thursby.com/cifs.

Chapter 9

Troubleshooting

You may have trouble getting DAVE to work on your Macintosh. Most problems are easily solved and are usually due to your Macintosh configuration.

DAVE depends on the following items:
- Proper network cabling
- Proper MacTCP or Open Transport TCP/IP configuration
- Correct installation of the DAVE Client software
- Correct installation of the DAVE Print Client software
- Correct installation of the DAVE NetBIOS driver software
- Correct license information provided to DAVE

Follow each section on the following pages to determine where you may have problems and to determine what is causing them.

If DAVE is not working at all, start with the Network Connectivity section. If DAVE is operating, but not the way you expect, start with the DAVE Operation section on page 6-7 of this chapter.

Network Connectivity

If nothing seems to work, you should start by testing the connection between your Macintosh and your server.

Ping Your Macintosh

Ask your Systems Administrator to ping your Macintosh. You may want to follow the directions below. If you can ping successfully, go to the DAVE Operation section on page 6-7 of this chapter. If ping fails, check your network cabling starting with the Checking Network Connections section on page 6-3 of this chapter.

     A. If you are using MacTCP, determine your Macintosh IP address by starting the MacTCP Control Panel. If you are using Open Transport, determine your Macintosh IP address by starting the TCP/IP control panel.

     B. Now ask your Systems Administrator to ping your IP address. From the MS-DOS prompt, most Windows systems will perform this with the following command:

```
ping 192.168.0.3
```

Where 192.168.0.3 is your Macintosh IP address.

OR

```
ping sandy
```

Where sandy is your Macintosh computer name.

C. If the ping succeeds, continue with the DAVE Operation section on   page 6-7 of this chapter.

Note: Some ping programs give a single message: Reply from 192.168.0.3.   Others ping programs will continuously ping and print a message for each response. The ping has failed if nothing occurs after a few seconds. You may receive the message: Bad IP address 192.168.0.3.

D. If the ping has no response or prints the message Bad IP address 192.168.0.3, continue with the Checking Network Connections sections. You probably have a cabling or router configuration error.

Checking Network Connections

Your Macintosh may already be using a network to access printers or AppleShare servers. If you are operating AppleTalk on the same network cable as MacTCP or Open Transport, you can rule out any physical cable problems by connecting to your printer or an AppleShare server.

Start your Network Control Panel (use the AppleTalk Control Panel if you have Open Transport) and verify that it is using the same network as MacTCP or Open Transport TCP/IP. If this is correct and you can view printers or AppleShare servers with the Chooser, your network cabling is probably working properly. Continue with the Macintosh Configuration section on page 6-4 of this chapter.

If you only have TCP/IP using a network interface, you may need to refer to the documentation that came with your network hardware. Most manufacturers will supply you with diagnostic software. Here are some common cabling problems:

A. Improper termination for Ethernet 10Base-2 and LocalTalk cabling. Be careful not to overload LocalTalk cables with too many legs. Be sure to use self-terminating transceivers correctly.

B. Improper 10Base-T cabling. Search for diagnostic LED indicators on your transceiver and hub.

If you can not find any cabling problems, continue with the Macintosh Configuration section on page 6-4 of this chapter.

Macintosh Configuration

For DAVE to operate properly, your Macintosh must have TCP/IP software (either MacTCP or Open Transport TCP/IP) installed and configured correctly. To configure the TCP/IP software, you must know the following information:

A. Your IP address. This number is usually represented as four decimal numbers separated by periods. For example:
                              192.168.0.248

B. Your subnet mask. This number is also represented as four numbers separated by periods. Each of the numbers represents a binary mask value (usually 255). For example, a common subnet mask for a class C network is 255.255.255.0.

1. MacTCP Configuration

Verify your MacTCP configuration by using the MacTCP Control Panel located in the Control Panels item under the Apple menu.

A. Verify that the selected icon matches your network interface and cable type.

B. Verify that the IP address is set correctly.

C. If you are using Ethernet, you can determine your hardware address by option-clicking on the Ethernet icon. The address will display in hex below the icon. This address is often helpful when diagnosing problems with routers.

D. Use the More... button to verify your Gateway Address. Unless your Macintosh is directly connected to the same LAN as your server, this value must be set to the router address that relays packets between the two networks.

E. Verify that the subnet mask is set correctly. This must be set using the custom sliding control in the IP Address   section of the dialog.

2. Open Transport Configuration

Verify your Open Transport configuration using the TCP/IP Control Panel located in the Control Panels item under the Apple menu.

A. Verify that the Connect via popup menu matches your network interface and cable type.

B. Verify that the Configure popup menu has been properly selected. If you are not sure of the proper selection, ask your   Systems Administrator.

C. Enter your IP Address as a four decimal number separated by periods. See Figure 6-3.

D. Verify that your Subnet mask is set correctly. This should be entered as a four decimal number separated by periods. See   Figure 6-3.

E. Verify that you have the correct router address entered. Unless your Macintosh is directly connected to the same LAN as your server, this value must be set to the router address that relays packets between the two networks.

Network Configuration

Be sure you understand how IP routing and addressing works. If you are not sure, there are many good reference books on this subject. Verify that you have assigned IP addresses correctly. Common problems include the incorrect use of subnet masks, and incorrect settings for default routes or gateway addresses.

DAVE Operation

DAVE Installation Problems

You can quickly verify that DAVE is installed by restarting your Macintosh and watching for the DAVE Start-up Icons to appear at the bottom of your screen. All of the following icons should appear:

Dave Client   NetBIOS

If you do not see these icons, you should reinstall DAVE.

You may see the icons appear with a crossed-out marking. This indicates one of the following problems:

A. You are not running Mac OS 7.5 or greater.

B. You do not have support for the File System Manager, or the File System Manager extension is not installed or not enabled.

C. You do not have enough system memory to load the DAVE driver.

DAVE Chooser Operation Problems

1. DAVE takes a long time to contact a remote server.

A. DAVE may have difficulty contacting the server. Verify that your Macintosh can communicate with the server. See the Network Connectivity section on page 6-2 of this chapter.

2. No Servers appear in the Chooser.

A. Verify that the DAVE Client icon is selected.

3. The DAVE Client icon is selected, but no servers appear.

A. If the watch cursor is displayed, you may have to wait a few minutes until DAVE Client locates the servers. If the watch cursor is not displayed, no servers were located.

B. Verify that you have a Master Browser or Primary Domain Controller (PDC). If you do not know whether you have a Master Browser or PDC, ask your Systems Administrator for assistance.

C. You may not have TCP/IP configured correctly. If you are using MacTCP, check your settings in the MacTCP Control Panel under the Apple menu. If you are using Open Transport, check your   settings in the TCP/IP Control Panel under the Apple menu.

4. After selecting the DAVE Client icon and a server from the server list box, a dialog displays stating: "Request to the remote server has timed out". Error #20.

A. Verify that the remote server is connected to your LAN and is booted.

B. Verify that the server list box has the correct server name spelling. If the spelling is incorrect, click the Setup button and select the server from the list of commonly used servers. Remove the server from the list and then add the server making sure that it is spelled correctly.

C. Verify that the remote server's network parameters are set correctly. The Systems Administrator should verify the workgroup, domain, and IP address.

D. You may have added incorrect information to your LMHOSTS file. See page 4-16 of this manual for more information about the LMHOSTS file.

5. A commonly used server is not listed in the server list box.

A. The server is not available. See the solutions to errors 1 through 4 in the DAVE Chooser Operation section on page 6-8 of this chapter.

B. Click the Setup button in the Chooser. Add the server to the Commonly Used Servers by selecting the Add button. After adding the server, click the Save button. See the Making a List of Commonly Used Servers section on page 3-10 of this manual.

6. After selecting a server from the server list and clicking the OK button, a dialog with a list of the server resources is not displayed.

A. The server is not available. See the solutions to errors 1 through 4 in the DAVE Chooser Operation section on page 6-8 of this chapter.

B. The server is not sharing any resources.

7. A share point is not in the list or is dimmed.

A. Your server may not be offering the share point you are looking for.

B. If the share point is a printer and it is dimmed, you may not have installed the DAVE Print Client correctly. Reinstall the Print Client and try to mount the printer again. See the Installation chapter of this manual.

C. If the share point is dimmed and is not a printer, you have already mounted this share point. Verify that you did not mount the share point using a different volume name.

8. After selecting a server from the server list and clicking the OK button, a dialog with a list for available server resources is displayed but no resources are listed.

A. No server resources are shared. The Systems Administrator must make the required resources available before access will be granted.

9. A shared resource cannot be mounted at boot time.

A. Go to the Chooser and verify that the server and share point still offer sharing.

B. Verify that your username and password are still valid on the server.

10. A resource is not available from a server.

A. Ask your Systems Administrator to verify that the resource is available and shared. Refer to the Windows server documentation   for information about file sharing.

11. After selecting the Entire Network from the server list, no workgroups are displayed.

A. No workgroups are defined on the local network. The Systems Administrator must define the workgroups and domains on the server.

12. After selecting the Entire Network from the server list, a list of workgroups is displayed, but your preferred workgroup is not listed.

A. The workgroup needs to be added to the local network. Ask the Systems Administrator to do so. Refer to the Windows server documentation for information on this task.

13. After selecting the Entire Network from the server list, a list of workgroups is displayed. When a server is selected there is a delay and then a dialog states that DAVE could not connect to the remote server.

A. The server's network interface parameters may be preventing the connection. Ask the Systems Administrator to correct the network interface parameters. Refer to the Windows server documentation for information on this task.

14. After selecting the Entire Network from the server list, a list of workgroups is displayed. When a workgroup is selected there is a delay and then a dialog states that the remote server reported an error.
Error #1:-124.

A. Ask the Systems Administrator to verify that the workgroup is still available.

15. After selecting a server from the server list, a list of resources is displayed. When a resource is selected there is a delay and then a dialog states that NetBIOS has run out of resources.
Error #9.

A. You do not have enough memory to mount another volume. Try dismounting any unneeded volumes or quiting out of any unneeded applications.

16. Errors are reported when selecting a server or entering a username and password.

Refer to the DAVE Error and Information Messages on page 6-18 of this chapter for information about this particular error.

17. The username and password is always rejected.

A. Verify you are typing the username and password correctly.

B. Attempt mounting the same resource point from another computer in your network. If mount is successful, you have probably entered the incorrect Workgroup name in your NetBIOS Control Panel. See the Using the NetBIOS Main Control Panel section on page 4-2 of this manual.

C. Verify that the Network Administrator has given you access to that server.

18. The remote server reported an error. Access was denied by the remote server. Please check with your Systems Administrator to make sure you have the correct access to this shared volume. Error #1/-5000.

      A. Verify that you have access privileges to the share point.

19. The remote server reported an error. Too many users are connected to this shared volume. Please ask your Systems Administrator to allow more connections. Error #1/-5061.

      A. Ask your Systems Administrator to increase the user limit on the the share point.

19. The remote server reported an error. There are currently no login servers available to service the login request. Make sure your Primary Domain Server is still on the network. Error #2/-5001.

      A. Verify that your Primary Domain Controller is active. Ask your Systems Administrator for assistance.

File Access Problems

1. Some files don't appear.

      A. The file name may be a hidden Windows file.

2. Sharing files with PC Applications doesn't work.

      A. Verify that the application version on Windows is the same version used on the Macintosh.

      B. You may need to save your work in the correct format from the PC or Macintosh application. Refer to the application's user's manual.

Print Client

Printing Problems

1. When adding a printer in the Add dialog, the watch cursor appears and nothing happens.

      A. The print server does not exist or is off-line. Talk to your Systems Administrator to determine the cause. When you first setup a remote printer, DAVE will verify that it can connect to the server. It   will also verify the username and password. This information will be stored in the DAVE database.

2. When printing from an application, the output is not directed to the remote printer you mounted with DAVE.

      A. Verify that the printer that you wish to print to is selected in the application's print dialog (if available). If this is not available, open the Chooser, click the LaserWriter 8

icon from the left group box,   and select the preferred printer from the resources list. You may also select the Chooser Setup button to verify that the printer is installed correctly. The printer must be PostScript LaserWriter 8-compatible.

3. The preferred printer (Windows Server) is not listed in the Chooser list box when LaserWriter 8 is selected.

       A. Open the DAVE Print Client Control Panel located under the Apple menu and verify that the ON radio button is selected. If the required printer is not listed in this Control Panel's list box, add the printer using the New button.

4. When attempting to print to a remote printer, nothing or garbage is printed.

       A. Verify that the print server is on-line.

       B. Verify that the printer is on-line and connected to the server.

       C. Verify that the server controls the specified printer.

       D. Using the DAVE Print Client Control Panel located under the Apple menu, double click the print gateway. A dialog with the printer settings will display. Check the settings and click OK.

       E. Examine the server's print queue for the specified printer. If the queue is empty or has your print file and is not printing, discuss the problem with the Systems Administrator.

       F. Verify that the printer is LaserWriter 8-compatible.   If the printer is not LaserWriter 8-compatible, results will be indeterminate.

       G. Verify that the printer is PostScript-compatible.

       H. If you installed your key and believe it is corrupted, you must remove it from the NetBIOS Preferences file. The NetBIOS Preferences file is located in the Preferences folder inside your System folder. After you have dragged this file to the trash, open the NetBIOS Control Panel from the Apple menu and re-enter your license key.

       I. Verify that the NetBIOS driver is correctly configured. The NetBIOS Control Panel is located under the Apple menu. If you are unsure of the correct settings, ask your Systems Administrator for assistance. See the NetBIOS Control Panel chapter in this manual.

5. After selecting a DAVE-mounted printer from the Chooser and clicking the Setup button, the Automatic Setup fails in the setup dialog.

       A. In the Chooser, verify that you selected the LaserWriter 8 icon, not the LaserWriter icon.

6. When the LaserWriter 8 icon has been selected, a dialog displays stating that LaserWriter 8 requires AppleTalk.

       A. If AppleTalk is inactive you will receive this message. Choose the AppleTalk Active button in the Chooser dialog and then select the LaserWriter 8 icon again.

7. After rebooting your system, a dialog displays stating that you do not have a valid NetBIOS license.

   A. You must have a valid license key. If you installed your key and believe it is corrupted, you must remove it from the NetBIOS Preferences file. The NetBIOS Preferences file is located in the Preferences folder inside your System folder. After you have dragged this file to the trash, open the NetBIOS Control Panel from the Apple menu and re-enter your license key.

8. At reboot, a dialog displays stating, Sorry, a system error has occurred. Finder.

   A. Reboot the system while holding down the shift key. This will prevent extensions from loading. When the system has rebooted, open the Extensions Manager from the Control Panel item under the Apple menu and turn ON the following:

        - DAVE Print Client extension
        - NetBIOS extension
        - LaserWriter 8 extension

   Now reboot the system. If these extensions were already turned ON, discuss the problem with your Systems Administrator.

Miscellaneous Solutions

1. The Print Client requires that the NetBIOS driver is installed with a valid license key.

2. The printer must be LaserWriter 8-compatible and PostScript-compatible. Verify that you have selected the correct PostScript Printer Description (PPD) in the DAVE Client dialog.

3. You must select the correct AppleTalk zone from the Chooser dialog. See Determining Your Computer's Current Zone on page 3-21 of this manual.

4. In the Chooser dialog, the LaserWriter 8 icon must be active when you select the printer from the resource list. If a Spooler icon does not appear to the immediate left of the printer name, select the Setup button to automatically set the printer's parameters.

5. Verify that the local name you have chosen for the printer does not conflict with another printer name on the network.

6. The printer you wish to mount may be attached to a particular server. However, the server may not permit sharing. To access the printer, you must set sharing on the server. Ask the Systems Administrator for assistance.

7. Verify that the resource requested from the server is a printer. There are other shareable resources such as files, file structures, tape drives, CD-ROMs, etc.

If all settings appear to be normal, then you can ask the Customer Help Desk to diagnose your problem. Open the Chooser dialog and select the Foreground printing option. Attempt to print a file, and note the messages that are displayed in the notifier box. Also, note any dialog/notifier boxes that are displayed, their messages and their numbers.

8. PPP software will attempt to connect to remote networks when any applications attempt to access the IP network. DAVE has three applications that may attempt IP network access at boot. If you do not want PPP to connect to a remote network at boot, complete the following tasks:

  A. Turn off the DAVE Message Popup extension in the Extensions Manager.
  B. Select the Off option in the DAVE Print Client Control Panel.
  C. Turn off any mount at boot share points.

DAVE Access

Send Problems

1. When selecting User or Computer and clicking the Send button in the Send dialog. A dialog displays stating that it could not connect to the remote user or computer.

  A. The remote computer may be off-line or disconnected. Contact the Systems Administrator.

  B. A remote computer with the requested name may not exist. Contact the Systems Administrator.

  C. The user may not exist on the requested remote system.

2. When selecting Workgroup and clicking the Send button in the Send dialog. A dialog displays stating that no computers are responding to the workgroup name provided.

  A. The selected workgroup does not exist on the Windows remote system. If you are certain the workgroup exists, contact the Systems Administrator to determine the workgroup's status.

3. In the Send dialog, no workgroups are displayed in the To: field.

  A. No workgroups are defined for the field. Contact the Systems Administrator to setup the workgroups on remote systems.

4. When sending a message to a remote server that you are sure is on-line, the message is not received.

  A. Discuss the problem with the remote server's Administrator. Verify that the user or workgroup is available and can receive messages.

  B. Verify that the Messenger Service has been initiated from the Services Manager on the remote server. If the Messenger Service has not started, request that the server's Administrator do so.

Receive Problems

1. You don't receive messages sent from remote systems.

A. Open the DAVE Access from the Apple menu. In the Edit menu, select the Preferences item. The Preferences dialog will display. Select the Display Received Messages check box. If you have a speech manager installed, you can also set the Read Messages Aloud check box (optional). Fill-in the Username edit field with your name (optional). In order for DAVE to receive messages one of these choices must be selected.

B. The NetBIOS driver is not installed, is installed incorrectly or is not active. Verify that the NetBIOS driver is installed and that its entry is checked in your Extensions Manager. Open the NetBIOS Control Panel from the Apple menu to verify settings.

C. Verify that the Messenger Service has been initiated from the Services Manager on the server. If it has not started, request that the server's Administrator do so.

DAVE Error and Information Messages

This section describes each informational error and warning message that DAVE can display. Messages are divided into the following categories:

DAVE Client Internal Errors: Errors committed or reported by DAVE Client.

NetBIOS Errors: Errors committed or reported by NetBIOS.

Remote Server Errors: Errors committed or reported by the Remote Server.

Ungrouped Errors: Critical Errors that rarely occur.

DAVE Client Internal Errors

1. The DAVE Client ran out of memory. Please unmount any other volumes and try the command again.

A. The Macintosh system does not have enough memory available to complete the command. Increase memory or close applications to increase available memory.

2. An error occurred while attempting to open the DAVE Client Preferences file. Please delete the DAVE Client Preferences file from the Preferences folder located in your System folder.

A. Drag the DAVE Client Preferences file to the trash. This file can be found in the Preferences folder within the System folder. After deleting the file, open the Chooser under the Apple menu and click the DAVE Client icon. Select the Setup button and the DAVE Setup dialog will display. See Changing DAVE Client Settings on page 3-10 of this manual.

3. The DAVE Client did not load. See the DAVE Installation chapter. Verify that the File System Manager is loaded.

A. See the DAVE Installation section on page 6-7 of this chapter.

4. A call to the DAVE Client driver failed. Please report this error to TSS Customer Support.

A. Please turn to page 1-3 of this manual for information about contacting TSS.

5. The Macintosh System rejected the mount command. Please report this error to TSS Customer Support.

A. Please turn to page 1-3 of this manual for information about contacting TSS.

6. An unknown error occurred. Please report this error to TSS Customer Support.

A. Please turn to page 1-3 of this manual for information about contacting TSS.

NetBIOS Errors

1. An internal error has occurred between the DAVE Client and the NetBIOS driver. Please report the error to TSS Customer Support.

A. Please turn to page 1-3 of this manual for information about contacting TSS.

2. The remote connection has been broken. Make sure the remote server is still up and running.

A. The connection between your Macintosh and the server was unexpectedly interrupted. Contact the Systems Administrator to verify server status.

3. The request to the remote machine has timed out. Make sure that the remote machine is still up and running.

A. The server may not be available or you may not have privileges on the server. Contact the Systems Administrator to verify server status.

4. Your Master Browser is no longer responding to our requests. Please make sure the Master Browser is still up and running.

A. The connection to the Master Browser has been interrupted. If you have another Windows 95 or Windows NT server on your network, it should assume the Master Browser role. If another Windows machine does not assume the Master Browser role, contact the Systems Administrator to verify server status.

5. NetBIOS has run out of resources. Try unmounting volumes or freeing resources used by other NetBIOS applications before trying the command again.

A. NetBIOS has run out of memory. Add memory, increase virtual memory or decrease mounted volumes. After increasing your system memory, try the command again.

6. The name assigned in the NetBIOS Control Panel is in use by another machine on the network. Check with your Systems Administrator and make sure that you have the correct node and group name.

A. The name assigned in the NetBIOS Control Panel must be unique to the network. The name can be up to 15 characters long and can be any name you choose provided that it is not already in use on the network. Contact the Systems Administrator if you have further problems assigning the NetBIOS name.

7. The NetBIOS name table is full. Please check with the manual on how to increase the name table size from the NetBIOS Control Panel.

A. To change the NetBIOS name table size, open the NetBIOS Control Panel and click the Admin button. See page 4-11 of this manual for more information about the name table size.

8. The remote connection was aborted abnormally. Please check and make sure that your network is still running.

A. The connection between your Macintosh and the server was unexpectedly interrupted. Contact the Systems Administrator to verify server status.

9. The NetBIOS driver is too busy to handle the DAVE Client command. Try unmounting volumes before trying the command again.

A. Decrease NetBIOS usage before continuing. Once you have decreased usage, try the command again.

10. The NetBIOS driver is not loaded. See the DAVE Installation chapter. Verify that either MacTCP or Open Transport is loaded and running.

A. DAVE Client will not operate without NetBIOS. Refer to the Installation chapter in this manual for information about installing NetBIOS. DAVE Client also needs MacTCP or Open Transport TCP/IP. To check MacTCP settings, open the MacTCP Control Panel under the Apple menu. To check Open Transport settings, open the TCP/IP Control Panel under the Apple menu. See the Macintosh Configuration section on page 6-4 of this chapter.

11. The DAVE Client received an incomplete message from the remote machine. Please make sure that the remote machine is configured correctly.

A. The remote machine is not operating properly. Ask the Systems Administrator to verify that the machine is configured correctly.

Remote Server Errors

1. An unknown error message was returned by the server.

A. The server is not operating correctly. Contact the Systems Administrator to verify server status.

2. The remote server has either caused or detected a bad message.

A. The server is not operating correctly. Contact the Systems Administrator to verify server status.

3. Your connection was rejected because of an invalid username or password.

      A. The password or username was typed incorrectly.

      B. You may have the wrong workgroup defined in the NetBIOS Control Panel.

4. The server has broken the connection to your node.

      A. The connection between your Macintosh and the server was unexpectedly interrupted. Contact the Systems Administrator to verify server status.

5. The remote volume is not ready. Please check and make sure that the volume is on-line.

      A. The volume is not available or has failed. Contact the Systems Administrator about the volume's status.

6. The shared path does not exist. Please make sure that the shared point and path exist on the remote server.

      A. This error can occur when the file system you are mounting is removed from the server's export list before you can click on it. Ask the Systems Administrator if the shared point and path exist on the remote server.

Ungrouped Errors

1. The DAVE Client failed to add either your NetBIOS name or domain to the network. Check with your Systems Administrator and make sure that you have the correct node and group name.

      A. The NetBIOS name or domain was not added to the network. Verify that you are using the correct node and group name. Also verify that you are not using a node name that already exists on the network.

2. The Alias file or MountAtBoot resource you are using to mount this volume is an old version. Please remake the Alias file or use the Chooser to remake the MountAtBoot resource.

      A. The Alias file or MountAtBoot resource is no longer valid. Drag the file or resource to the trash and remount the volume.

3. The remote server does not support any of the DAVE Client dialects. Please check the manual for servers supported by the DAVE Client.

      A.   Server in this context, is the machine platform rather than a machine that serves a network. See your System Administrator.

4. DAVE could not mount the volume because we are no longer
connected to the remote server.

      A. The connection between the remote server and your Macintosh has been interrupted or disconnected. Reconnect and try to mount the volume again.

Appendix A

Software License Agreement

This SOFTWARE LICENSE AGREEMENT made by and between Thursby Software Systems, Inc. (hereinafter "AUTHOR") and the purchaser of the license (hereinafter "CUSTOMER"):

AUTHOR has proprietary software including documentation identified as DAVE™ (hereinafter LICENSED PROGRAM");

Both parties hereto agree as follows:

1. GRANT
AUTHOR grants to CUSTOMER a royalty-free, nontransferable and nonexclusive license to copy and use the LICENSED PROGRAM.

2. LICENSE TERMS
CUSTOMER shall have the right to use the LICENSED PROGRAM or any portion thereof on a Computer System (hereinafter "SYSTEMS") located at the CUSTOMER's site.

For this purpose, the CUSTOMER may:

      a) Transfer the LICENSED PROGRAM from one computer to another provided that the LICENSED PROGRAM is used only on one computer at a time.

      b) Copy the LICENSED PROGRAM for the purpose of (i) using the LICENSED PROGRAM on the SYSTEM; and (ii) for archive or emergency restart purposes.

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through any data processing network or other means may gain access to said LICENSED PROGRAM.

5. TITLE
No title to or ownership of the LICENSED PROGRAM or any parts thereof is transferred to CUSTOMER. CUSTOMER shall do nothing inconsistent with AUTHOR's title in the LICENSED PROGRAM.

6. WARRANTY
AUTHOR warrants that at the time of delivery of the original Software supplied to the CUSTOMER, and for a period of ninety (90) days thereafter, that the original software will perform in accordance with the specifications described in this manual. The AUTHOR does not warrant that the Software will meet all of CUSTOMER's requirements or will operate uninterrupted or error-free.

7. TERMINATION
 In the event that CUSTOMER neglects or fails to perform or observe any of its obligations under this Agreement, or if any assignment shall be made of its business for the benefit of creditors, or if a receiver, trustee in bankruptcy or similar official shall be appointed to take charge of all or part of its property, or if it is adjudged a bankrupt, AUTHOR may immediately terminate this agreement and all licenses granted hereunder.

If after repeated efforts AUTHOR is unable to make the software operate as warranted, the CUSTOMER may terminate the license(s) of DAVE and receive a refund of the License Fee(s) paid.

8. ASSIGNMENT
This Agreement and the licenses granted hereunder may not be assigned, sublicensed, or otherwise transferred by the CUSTOMER without prior written consent from AUTHOR.

9. DISCLAIMER AND LIMITATION OF LIABILITY
THE CUSTOMER SHALL HAVE THE SOLE RESPONSIBILITY FOR ADEQUATE PROTECTION AND BACKUP OF ITS DATA USED IN CONNECTION WITH THE LICENSED PROGRAM. IN NO EVENT WILL AUTHOR BE LIABLE FOR (i) SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES OR (ii) ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA, OR PROFITS, RERUN TIME, INACCURATE INPUT OR WORK DELAYS, OR ANY DIRECT PROPERTY DAMAGE ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR THE USE OR PERFORMANCE OF THE LICENSED PROGRAM, WHETHER IN ACTION, IN CONTRACT, OR TORT INCLUDING NEGLIGENCE.

The extent of AUTHOR's liability under this warranty shall be limited to supplying as soon as practicable Code Corrections which AUTHOR determines to be necessary, provided that written notice of a claimed problem is
received by AUTHOR within the warranty period.

10. GENERAL
This Agreement supersedes all prior agreements concerning the subject matter herein and may not be changed or terminated except by a written communication signed by the party against whom the same is sought to be enforced. If any of the provisions of this Agreement are invalid under any applicable statute or rule of law, such provisions or portions thereof are to that extent deemed to be omitted.

This Agreement shall be governed by the laws of the State of Texas.

Appendix B

Support and Maintenance

How to get Additional Support

Although a maintenance support contract may be purchased by those who may require extended services past the initial ninety day warranty, we have tried to make the support system simple for you to use as a new customer.

The best way to report software problems is to do it in writing. We support facsimile reporting as well as e-mail from the Internet. The use of electronic mail avoids the possible confusion of a phone conversation and provides a tracking mechanism for each of us to ensure that every reported problem is addressed. Our internet support address is dave@thursby.com.

For the ninety days after purchase, TSS will provide you with unlimited written problem reporting. Although unlimited written problem reporting is supported during this time period, we must restrict support related phone calls to a maximum of 4 calls per license without additional support charges.

If you telephone us for support, please indicate that you are calling for DAVE support and that this is your first support call. Our receptionist or support secretary will take your registration information and will then provide the call information to our support group. We must have your serial number and version number of the software that you are running. If your problem is critical, please indicate this at the time of your call so that it will be given the proper priority.

Please either mail or fax your registration card to us as soon as possible.   By being a registered user, you will be automatically notified of new product updates and enhancements. Customers under a support contract will receive these updates at no additional charge. Registered customers will be offered a discounted price.

Additional information on support offerings may be obtained by contacting our sales department.

Appendix C

Glossary

AppleDouble	A standard method of storing Apple resource and data forks in two files. Used in non-Apple file systems that lack the concept of a resource fork. The data fork is stored in one file, while the resource fork is stored in a separate file.
Backup Domain Controller (BDC)	A Windows NT Server that receives a copy of the domain's security policy and domain database from a Primary Domain Controller (PDC). A BDC will assume the role of the PDC if the PDC fails.
Broadcast	A method of sending the same information to multiple recipients using User Datagram Protocol (UDP). DAVE uses broadcasting to locate Windows servers.
Chooser	An Apple utility used to choose services and devices that Macintosh users need. Used to select file servers, printers, fax devices, etc.
CIFS	Common Internet File System. A protocol that provides an open cross-platform mechanism for client systems to request file services from server systems over a network.
Client	A computer that accesses shared network resources provided by another computer (called a server). See Server.
DNS	Domain Name Service. A service and protocol used with TCP/IP to determine network numbers from names and vice versa.
Domain	A concept used in TCP/IP networks to organize textual names for IP numbers and also for services such as mail exchangers. The domain concept provides a hierarchy of authorities for naming.
Domain Name	The name by which a domain is known to the network.
FAT	File Allocation Table. A table or list maintained by some operating systems to monitor the status of various segments of disk space used for file storage. Often used to refer to DOS, Windows and Windows 95 file systems.

File	A named set of records stored or processed as a unit.
File System	A collection of files organized using a particular method. File systems can have many different forms, such as Apple's HFS, UNIX, DEC's RMS, Windows' FAT, etc.
Fragmentation	A process used by IP to break large packets into smaller ones when forwarding them to media with a smaller packet size (MTU).
FSM	File System Manager. A Mac OS system extension that allows Macintosh applications to access non-Apple file systems such as NFS.
Gateway	A network routing device used to forward packets to systems that are not on a local network. A gateway connects networks or systems of different architectures.
ICMP	Internet Control and Monitoring Protocol. A special control protocol that operates in the IP layer. Used to test connectivity (Ping) and to report errors.
IP	Internet Protocol. This is the routing layer protocol for TCP/IP.
LMHOSTS	A file commonly used to locate remote computers for Microsoft networking file, print and remote procedure services and for domain services such as logons, browsing, replication, etc.
MacTCP	Apple's older implementation of the TCP/IP protocol for the Macintosh. See Open Transport.
MTU	Maximum Transmission Unit. The maximum size packet that can be sent over a given media.
MTU Path Discovery	A method used by some IP implementations to dynamically determine the MTU between two communicating nodes. Requires routers that support ICMP error responses.
NetBIOS	Network Basic I/O System. A networking software interface for the IBM personal computer and compatible systems that provides datagram and connection oriented communication and name service to applications.
NTFS	Windows NT File System. An advanced file system designed for use specifically within the Windows NT operating system. It supports file system recovery, extremely large storage media, and various features

	for the POSIX subsystem. It also supports object-oriented applications by treating all files as objects with user-defined and system-defined attributes.
Open Transport	Apple's standard architecture for networking and communication. Provides Macintosh applications with a transport independent interface.
Ping	A procedure that checks connectivity between two systems by sending a special protocol message between them. The IP protocol will use an ICMP ECHO message to perform this test.
PPD	PostScript Printer Description. A listing of PostScript printer capabilities in a standardized format.
Primary Domain Controller (PDC)	A Windows NT Server that authenticates domain logons and maintains the security policy and the master database for a domain. See Backup Domain Controller.
Print	The process of sending a file to a local or remote printer for hard copy output.
RFC	Request For Comments. The name of a series of notes that contain surveys, measurements, ideas, techniques, and other observations, as well as proposed and accepted TCP/IP protocol standards. RFCs are edited but not refereed. They are available on-line from the Network Information Center(www.internic.net).
Router	A device that relays packets between two communicating systems. Routers are very useful for connecting dissimilar network media such as LocalTalk and Ethernet.
Server	Refers to a computer that shares its resources with network users. See Client.
Share Level Security	Server security in which a password is entered for every sharepoint on the server.
Shared Resource	Any device, data, or program that is used by more than one other device or program. For Windows NT, shared resources refer to any resource that is made available to network users, such as directories, files, printers and named pipes.
SMB	Server Message Block. A protocol which allows a set of computers to access shared resources as if they were local. SMB is a subset of CIFS

Subnet	A method used to further divide a network number so that it can be used for multiple network numbers. How the network number is divided is determined by a subnet mask.
Subnet Mask	The subnet mask tells the IP software on a node what part of an IP address is the network number, and what part is the node number. It provides a finer division of the 32 bit IP address than the standard class A, B, and C addresses.
TCP	Transmission Control Protocol. This is the connection oriented transport for TCP/IP.
UDP	User Datagram Protocol. This is the standard connectionless transport protocol for TCP/IP. NFS clients and servers generally use UDP for all operations.
User Level Security	A security method where access to resources is authenticated through a Domain Controller (PDC or BDC).
Volume	The term used for Apple HFS file systems. This term may be used interchangeably with "file system".

Host Configurations

The following instructions are general guidelines for setting up various computers to work with DAVE. For more specific information on configuring these products you may want to contact Microsoft, Apple, the Samba users groups, and/or your System Administrator.

These instructions are intended as an example for an isolated network. If you are already connected to a LAN then these instructions may not apply.

Windows 95

Hardware Requirements-

The first thing you will need is a network adapter for each computer, the correct cable, and any other necessary hardware.

Twisted Pair-

If you connect computers using network adapters and twisted-pair cable, you will need a 10BaseT hub. You will not need a hub if you are using a cross over cable.

Thin Coax-

If you connect computers using network adapters and Thinnet (BNC/COAX) cable, you must connect the cable to each network adapter using a T-connector with a terminator at each end of the cable.

After installing the network adapter and making the network connections, reboot your machine. Windows 95 may detect the adapter. If not, then use the Add New Hardware tool in Control Panel to detect your network adapter. Once the network adapter is set up, follow these steps to make sure the correct network components are installed:

NOTE: You may need your Windows 95 installation disks.

1. Highlight Network Neighborhood and then use the right mouse button to click, and then choose Properties on the menu that appears. If Network Neighborhood is not on the desktop go to Start – Settings – Control Panel – choose the Network icon and double click on it.

Figure D-1: Windows 95 Control Panels

2. On the Configuration tab, make sure that at least the following network components are installed:

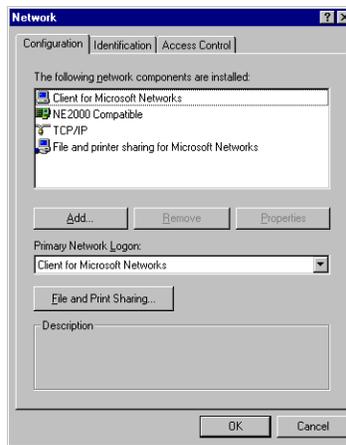- Client: Client for Microsoft Networks

Figure D-2: Windows 95 NetworkControl Panel

If not then Add – Client – Microsoft - Client for Microsoft Networks - OK

- Adapter: This should be the network adapter that you installed.
- Protocol: TCP/IP
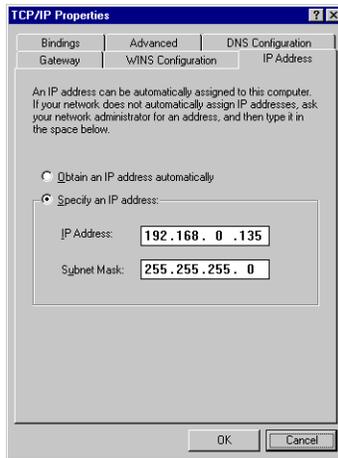
If not then Add – Protocol – Microsoft - TCP/IP - OK

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Figure D-3: Windows 95 TCP/IP Configuration

Configure your TCP/IP by highlighting TCP/IP and clicking Properties

- Select - Specify an address
- Enter the IP address (see section on configuring TCP/IP for additional help).
- Enter the Subnet mask (e.g. 255.255.255.0)
- Service: File and Printer Sharing for Microsoft Networks

Add – Service – Microsoft - File and Printer Sharing for Microsoft Networks - OK

3. Click the File and Print Sharing button, click the appropriate check boxes to select them, and then click OK.

4. On the Identification tab, enter a name for your computer and your Workgroup. This needs to be the same Workgroup as the one you will enter in your Macintosh NetBIOS. Click OK.
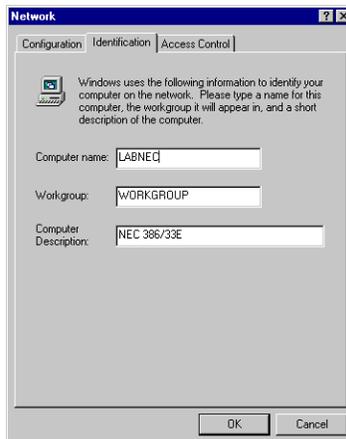

Figure D-4: Windows 95 Network Identity

NOTE: The computer name must be unique for each computer on the network.

5. Restart your computer when you are prompted to do so.

Sharing resources on Windows 95

1. Double-click My Computer.

2. Use the right mouse button to click the drive, folder, or printer you want to share with members of your network, and then click Sharing on the menu that appears.
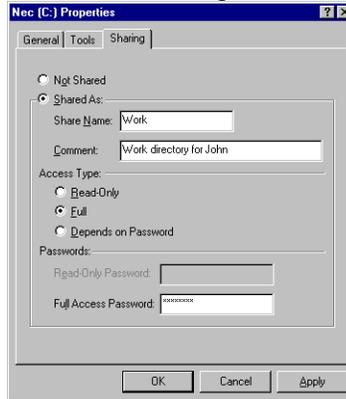
FigureD-5: Windows 95 Sharing Setup

3. On the Sharing tab, click Shared As, and then type a name for the share in the Share Name box.

4. Click the access type you want for this shared resource.

5. Click OK.

Your Windows 95 computer should now be ready to share files with other Windows 95 computers and your Macintosh using DAVE.

Windows NT

Hardware Requirements-

The first thing you will need is a network adapter for each computer, the correct cable, and any other necessary hardware.

Twisted Pair-

If you connect computers using network adapters and twisted-pair cable, you will need a 10BaseT hub. You will not need a hub if the cable is specifically designed to bypass a hub.

Thin Coax-

If you connect computers using network adapters and Thinnet (BNC/COAX) cable, you must connect the cable to each network adapter using a T-connector with a terminator at each end of the cable.

There are two ways to configure TCP/IP on Windows NT 4.0 - You can either use the Network Setup Wizard (Method 1) or manually configure it (Method 2).

Method 1

NT 4.0 has to have NT Networking installed. This is usually done during the installation process of NT. If it was not then choosing the properties of the Network Neighborhood will start the Network Setup Wizard.

Network Setup Wizard.

If your NT system is connected to the network via a network adapter select - Wired to the Network. Click Next

Click Find Next to have NT detect your network adapter. After it is detected click Next.

Check TCP/IP as the Network Protocol. Click Next. TCP/IP Setup.

If you have a DHCP server on your network click Yes and contact your system administrator for further help.

For this simple, network click on No to continue the TCP/IP setup. Eventually the Microsoft TCP/IP Properties box will appear.

Enter a valid IP address. (For help on what is a valid IP address see the section at the end of this document on Configuring TCP/IP).

Enter the Subnet mask. (e.g. 255.255.255.0)

The Default Gateway is unnecessary.

Click OK

At this point you may receive a message - "Microsoft TCP/IP - At least one of the adapter cards has an empty primary WINS address. Do you want to continue?" Click Yes.

Click Enable to enable the network bindings. Then click Next.

Click Next to start the Network.

Enter a unique name for your NT system. You may also select a Workgroup name. The default is Workgroup. Make sure you use this same workgroup name for you Macintosh.

Click Next. Click Finish. Let the computer restart.

The next window will allow you to select Network Services. DAVE only requires the following Network Services - NetBIOS, Workstation, and Server. By default these and RPC Configuration are installed. If you want to add further services then press the select from list button other wise click on the Next button.

Click Next to install selected components.

Your Windows NT 4.0 computer should now be ready to share files with other Windows computers and your Macintosh using DAVE.

Method 2

Right click on Network Neighborhood, select properties. Or you can choose Control Panel from the Start Menu under Configuration.

FigureD-6: Windows NT Control Panel

Identification

Computer Name: Enter a unique name for this computer
Domain: Enter a name - should be the same as the Workgroup name on the Mac.

Figure D-7: Windows NT Network Identification

Services:

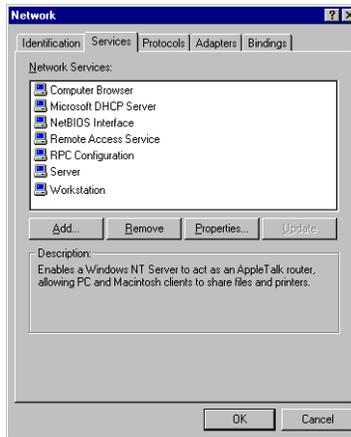Use the Add button to add theses services:
- Workstation
- NetBIOS
- Server

Figure D-8: Windows NT Services

You should have these services listed - Computer Browser, NetBIOS Interface, Server, and Workstation.

Protocols

Use the Add button to add TCP/IP.

Figure D-9: Windows NT Protocols

If you have a DHCP server on your network, click Yes and contact your system administrator for further help.

Note - For this simple network click on No to continue the TCP/IP setup. Eventually the Microsoft TCP/IP Properties box will appear. Click on the properties button to configure TCP/IP.

Check Specify an IP Address.

Enter a valid IP address. (For help on what is a valid IP address see the section at the end of this document on Configuring TCP/IP).
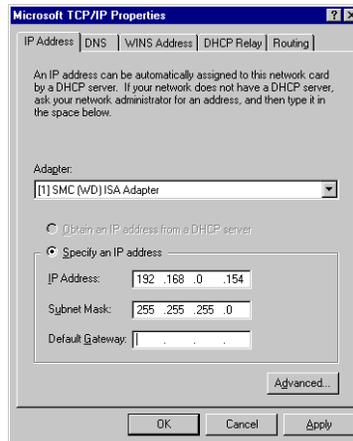
Figure D-10: Windows NT TCP/IP Configuration

Enter the Subnet mask. (e.g. 255.255.255.0)

The Default Gateway is unnecessary for a simple network. It is used as the path to reach other networks.

Bindings:

Click the Enable button.

Restart your system.

Your Windows NT computer should now be ready to share files with other Windows computers and your Macintosh using DAVE.

Windows for Workgroups 3.11

TCP/IP does not come with WFW 3.11. You will need to download the file TCP32B.exe from Microsoft at ftp.microsoft.com/softlib/mslfiles. This is a self extracting file that includes a very comprehensive help file for configuring Windows for Workgroups to use TCP/IP. For further information on it please contact Microsoft.

Macintosh

DAVE requires the following hardware and software:

• Any Macintosh with a 68020 or higher processor
• Mac OS 7.5.x with a minimum of 8 megabytes of RAM
• Apple's MacTCP or Open Transport TCP/IP
• Any hardware required to run TCP/IP. (Ethernet adapter ie: NIC, LocalTalk connector for MacIP, etc. Please see your Apple manual for specifics.)

Install you network adapter per the manufactures instructions.

Configure TCP/IP on the Mac according to the instructions in the DAVE manual and the section on configuring TCP/IP.   You can use either Open Transport TCP/IP or MacTCP.

Simple steps for Open Transport are:

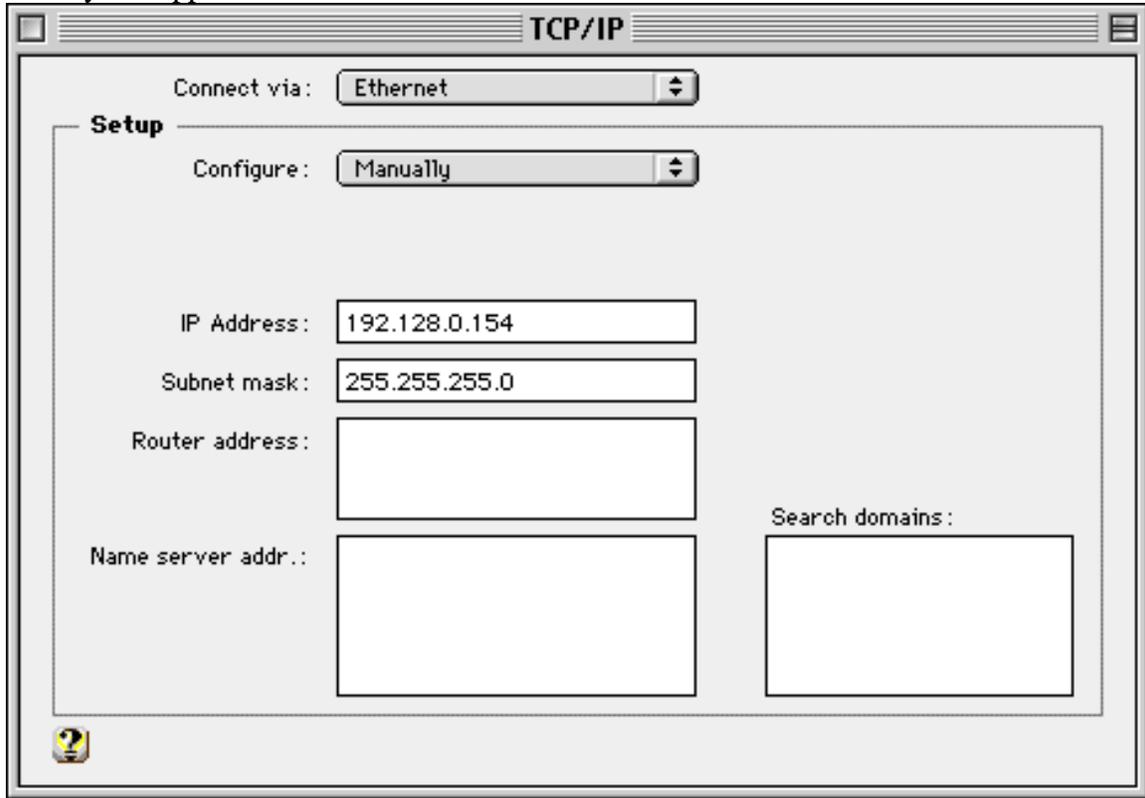Go to your Apple Menu - Control Panels – TCP/IP

Figure D-11: OpenTransport TCP/IP control panel

- Select connect via Ethernet
- Select Configure manually
- Enter the IP address (see section on configuring TCP/IP for additional help).
- Enter the Subnet mask (255.255.255.0)
- Close and save

* If you are using a modem for dial up access to the Internet then for DAVE you will need to make a new TCP/IP configuration. This is easily done by going to the File menu – select Configurations. Make a duplicate of your existing configuration and then rename it. Now configure it for Ethernet and save. When changing configurations you will need to reboot before using DAVE.
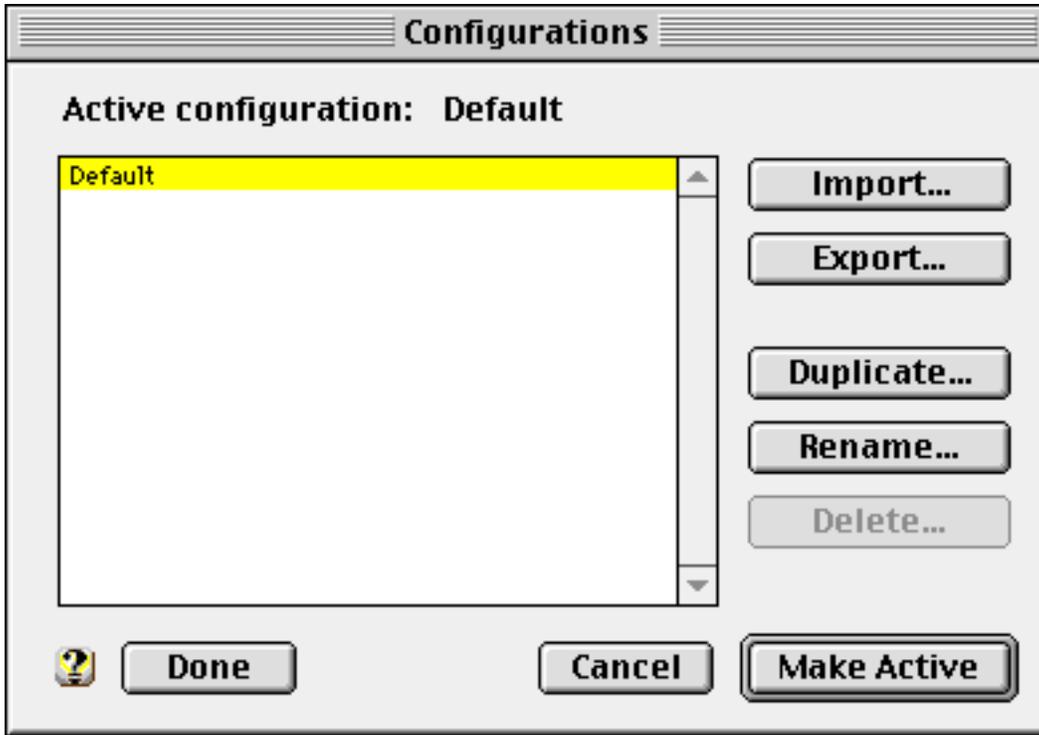
Figure D-12: OpenTransport Configurations dialog

Simple steps for MacTCP are:

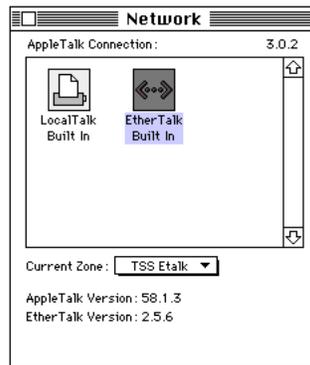Go to your Apple Menu - Control Panels – Network
- Select your adapter

Figure D-13: MacTCP Network control panel

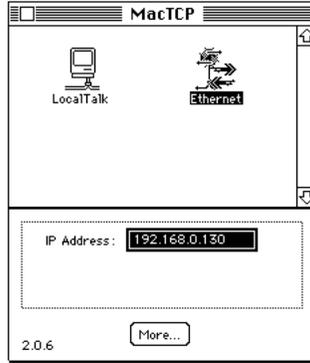Go to your Apple Menu - Control Panels – MacTCP

Figure D-14: MacTCP control panel

- Enter the IP address (see section on configuring TCP/IP for additional help).
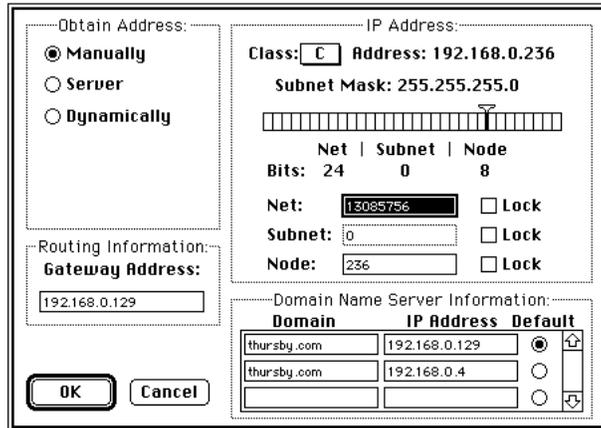- Click on MORE

Figure D-15: MacTCP More Screen

- Select Obtain an IP address Manually
- Set the IP address to class C
- Click OK

* If you are using a modem for dial up access to the Internet then for DAVE you will need to manually retype your TCP/IP configuration. When changing configurations you will need to reboot before using DAVE. There are several shareware utilities that will allow you to switch between different MacTCP configurations without manually reentering them.

Install DAVE according to the instructions in the manual.
Go to your Apple Menu - Control Panels – NetBIOS
- Enter Name, organization, and license number. Click OK
- Name – (this is the computer's name and must be unique)
- Work group – (same as Windows 95 work group)
- Description (optional)
- Click set and close.

Configuring TCP/IP

This section is provided as a simple guide for use in configuring Windows and Macintosh computers with TCP/IP. The examples below can be used in your settings if your network is of simple design. If you are attempting to connect your Macintosh to an existing network already running TCP/IP then you may need to contact your System Administrator for help in determining your correct IP address and subnet mask.

IP Address
For an internal network, with no global Internet connections, you can assign unique addresses to your computers as long as they conform to the class naming conventions.

The network address range 192.168.0.0 - 192.168.0.255 is reserved by the IANA for use with non Internet connected networks.

Example: 192.168.0.1 would be a class C address.
          192.168.0 defines the network .
                  1 would be the host.

Additional hosts would have the same network number 192.168.0 and different host numbers up to 254.

NOTE: The numbers 0 and 255 are reserved for the network and are not valid host addresses.

Example: 192.168.0.1 could belong to Joe's 6100/60 PowerPC Macintosh .
          192.168.0.2 could then belong to Linda's Intel P133 with Windows 95.
          192.168.0.3 through 192.168.0.254 could be used for additional machines.

Subnet Masks
For an internal network, which will not be physically connected to another network (via a bridge or router), the computers connected together should have the same Subnet Mask.

Example:
Joe's 6100/60 PowerPC Macintosh has

IP Address :   192.168.0.1
Subnet Mask: 255.255.255.0

Linda's Intel P133 with Windows 95 has

IP Address :   192.168.0.2
Subnet Mask: 255.255.255.0

They have the same network address - 192.168.0 with different hosts - .1 and .2 and the same Subnet mask - 255.255.255.0

In this kind of network configuration you will not need IP addresses for Default Gateways or routers.

Samba for UNIX

DAVE has been tested with Samba and found to work properly with it. In fact, the first public demonstration of the DAVE product showed a Macintosh in Redmond, Washington connecting to a Samba server in Australia. We have tested DAVE with Samba version

1.9.16p9. A number of our customers are using DAVE with other patch levels of Samba (1.9.16p11) and found the product to work. Our engineers have worked to make DAVE compatible with Samba, but due to the wide variety of Samba operating systems and versions, we cannot guarantee that DAVE will work for all Samba users.

There are a number of issues to keep in mind when using DAVE with Samba.

1) Use Samba 1.9.16p9 or later. Earlier versions of Samba can cause browsing problems for DAVE users.

2) Use settings that preserve file name case. This is important to Macintosh applications.

```
preserve case = yes
short preserve case = yes
```

3) If you use share level security (security = share), you may see inconsistent lists of shared resources appear in the DAVE chooser. Since Samba is sensitive to the name of the user on the client system, DAVE will send the Macintosh username to Samba when it connects. DAVE gets this username from the Macintosh Sharing Setup control panel 'Owner Name'. (File sharing does not have to be turned on to set the 'Owner Name' item). If DAVE users set this to their username on the UNIX host running Samba, they will be able to see their home directory in the resource list. If their home directory does not show up they should check the 'Owner Name' field. In most cases, Samba needs the 'Owner Name' to be set in order to check passwords. In general, you should set 'Owner Name' to a valid UNIX user name, and always supply the password for that user when accessing a Samba machine. These problems will not occur with Samba running in user level mode.

[remember: in share mode, you see the resource list, then are asked for a password; in user mode, you are asked for a username, password and domain first, then you get to see the resource list. In share mode you see the list of resources BEFORE you get to enter your username. That's why DAVE sends the 'Owner Name' item when it connects]

4) The following has been fixed in version 1.9.17p1 and later. If you do not have this version and are using server level security (security = server) there is a bug in Samba where it handles the SMBnegprot message. When Samba does passthrough authentication, it messes up the MID field in the reply message going back to the Macintosh. This is incorrect and we expect that the MID in the return matches the one we sent.

To fix the Samba source code you need to modify the reply_nt1 function in server.c:

Add this line at the top:

```
int mid_save = SVAL( outbuf, smb_mid );
```

Then find this line:

```
if (lp_readraw() && lp_writeraw())
```

And add this line BEFORE it:

```
SSVAL( outbuf, smb_mid, mid_save );
```

That will fix Samba so it sends DAVE the correct MID value.

We have found this information to be accurate in setting up Samba to work properly with DAVE.

Appendix E

Dial-up Configurations

DAVE can be used to connect via a dial up PPP connection to a Windows 95 or Windows NT computer.

Limitations
DAVE has been tested with Apple's Open Transport PPP v1.0. However, OT PPP does not support MS-CHAP authentication or dial-back connections. If you need a Dialer that supports Microsoft Authentication (MS CHAP), you can contact Network Telesystems (http://www.nts.com). They have a product that may help you. Thursby Software does not officially support NTS and this is not an endorsement, but it has worked in certain environments.

PPP Configuration
Configure your TCP/IP to have the address provided by the PPP Server. Once the PPP connection is working properly, install DAVE, reboot, dial your PPP connection, then configure DAVE as normal.

Browsing
By default DAVE uses broadcast messages for browsing. By default RAS does not allow broadcast messages through the PPP connection. Therefore, to get DAVE to work over PPP, modifications must be made to allow this to happen.

The most common solution is to use a WINS server on your network and configure DAVE to access that server. WINS is the solution that Microsoft has designed to allow Microsoft networking to be successful over multiple TCP/IP subnets. The TCP/IP addresses for your WINS server(s) should be available from your network administrator.

Another solution is to modify the RAS server to forward broadcast messages to the local network. This information should be available in your RAS server documentation. If you cannot find it, please contact us.

The final solution is to add the server names and IP addresses to an LMHOSTS file and then add the server names in the 'Commonly Used Servers' list in DAVE Client, Setup... window. In this situation, browsing will not work, so you can disable browsing in the same window. Only the servers in the 'Commonly Used Servers' will appear in your DAVE Client Chooser window.

RAS

Windows NT is a product of Microsoft Corporation. You should contact them about how to configure dialup networking. They have the resources to answer your questions properly.

PPP is a standard method of connecting to a TCP/IP network via a modem. RAS supports multiple protocols (NetBUEI, IPX/SPX, and TCP/IP). When you set RAS up as a TCP/IP dial-up server, it is in effect a PPP server. You can do this with the standard Windows NT Server, NT Workstation, and even Windows 95 with the Plus Pack.

Below are some general guidelines for setting up RAS on NT.

To install RAS, go to the Network Control Panel, Services Tab and select Add. Add the Remote Access Service. You must have a modem on the computer already configured in the modems Control Panel.

A RAS port can be configured to Dial out only, Receive Calls Only, or Dial out and Receive calls. You must have it configured for one of the last two in the RAS setup. When you configure RAS you must also configure its network settings. That dialog has two parts: Dial out protocols and Server Settings. We are only concerned with the server settings. Make sure that the checkbox marked - Allow remote clients running - has TCP/IP selected. We are not concerned with the other two protocols. Under encryption settings, choose one that your Macintosh PPP dialer will support. If you are using the Freeware extension FreePPP, then this will be - Allow any authentication including clear text. If you are using Open Transport PPP select - clear text.

Under RAS's TCP/IP configuration, you need to allow clients access to either your entire network or just that computer. You must also choose between static IP addresses and DHCP. If you choose Static IP addresses, then you need 1+ the number of modem ports IP addresses in your pool. If you want to allow your Macintosh to request a specific IP address, then click the check box at the bottom.

That should complete your RAS configuration. Close all dialogs and return to the Network Control Panel. Click on the Protocol's Tab, choose TCP/IP and then click on the Routing Tab. You need to confirm that there is a check box in the - Enable IP Forwarding - if you want your RAS clients to have access to the Entire Network. Click OK until your Network control panel is closed. You will need to reboot your NT server if it tells you to do so.

Once you have established your PPP connection from the Macintosh, you should use a Ping utility to confirm that you have a good TCP/IP connection. MacPing Demo 3.0 is available as a 30 day trial from our Web Site (ftp://ftp.thursby.com/utilities).

Once you have confirmed that TCP/IP is set up properly, and only then, it would be appropriate to test DAVE over said PPP connection.

Appendix F

Additional Software

Apple PC Exchange

Before mounting a shared resource, you should designate application programs for particular DOS suffixes. For example, you may wish to instruct your Macintosh to use Netscape for files with .HTM suffixes or to use Microsoft Word for files with .DOC suffixes. To specify the application for these DOS files, open your PC Exchange Control Panel from the Apple menu.

Note: If you do not know the suffix for a file on a Windows machine ask the Windows user. If the Windows user is unsure of the suffix use MS-DOS to display the file's name and suffix. Depending on your view options the suffixes may or may not appear in Windows Explorer or File Manager.
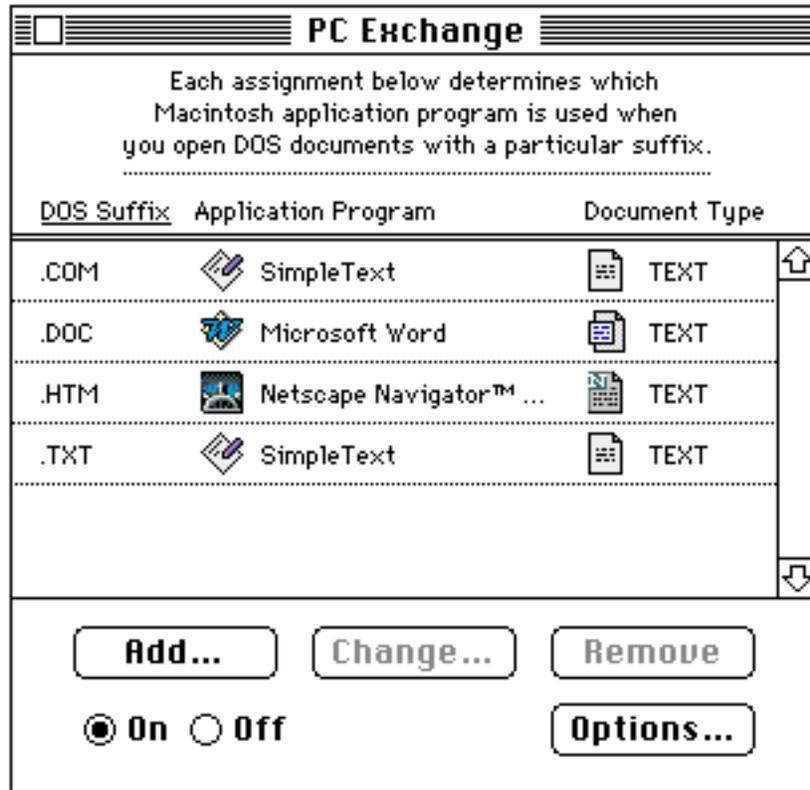

Figure F-1: PC Exchange Control Panel

Notice the DOS suffixes listed in the far left column in figure F-1. The applications assigned to open the DOS suffixes are listed in the middle column and the document types are listed in the far right column. If you have these items included in your PC Exchange Control Panel, the files will appear in the shared resource with the application's icon and will open with the application program.

To remove an item from the PC Exchange Control Panel, simply select the item and click the "Remove" button.

To add a suffix and the application it uses, click the "Add" button. A dialog similar to figure F-2 will display. Type a suffix in the DOS Suffix field and browse your directories for the application of your choice. When you have found the application that you wish to use with the designated suffix, select it and click the "OK" button.
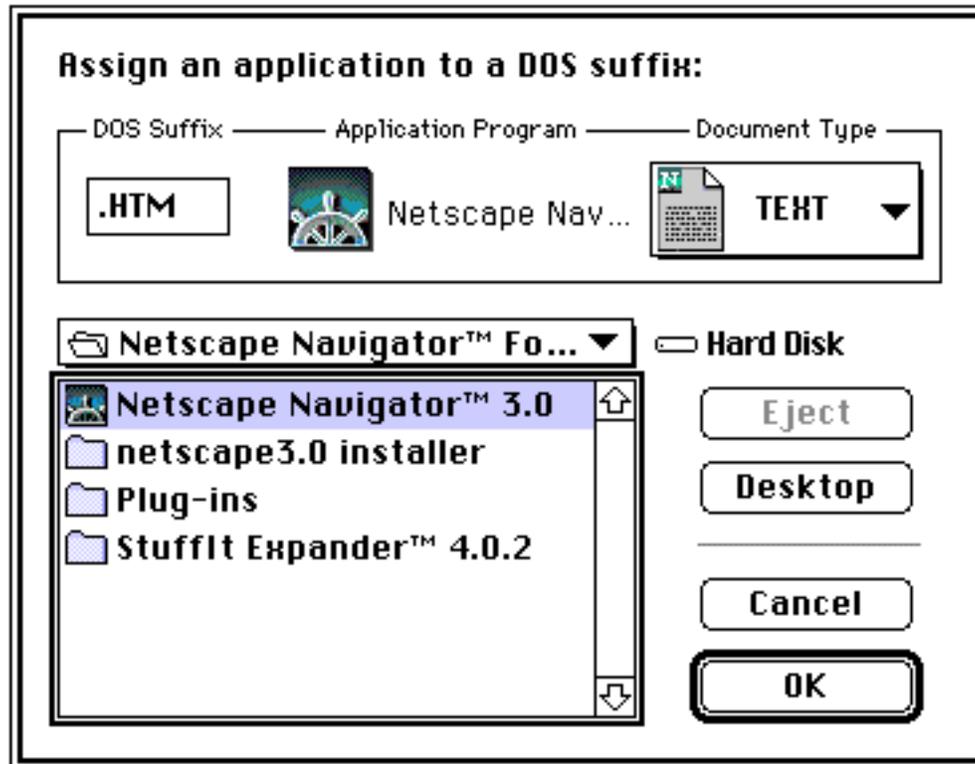

Figure F-2: Assign an Application to a DOS Suffix

The new item will appear in the PC Exchange Control Panel.

To change an item from the PC Exchange Control Panel, select the item and click the "Change..." button. The "Assign an application to a DOS suffix" dialog will display. You can change the suffix or the application and click the "OK" button to apply your changes.

Apple's Remote Only

DAVE requires users to have AppleTalk for the DAVE print client to work.

If you are not using AppleTalk for other functions on your network, you can configure the Macintosh AppleTalk port for a non-used printer port or use Apple's "Remote Only" virtual AppleTalk port. In this situation, the printer names would still be advertised, but would not be seen on the network.

The extension "Remote Only", is included with recent versions of the Mac OS shipping on CD. It is not installed automatically by the Mac OS Installer but can be found by searching the CD. The latest version is 2.1. If you do not have a Mac OS CD, Remote Only can also

be downloaded from Apple's Internet web site (http://www.apple.com) as part of the OpenTransport Extras.
Put this extension in your Extension folder in the System Folder, and configure AppleTalk to use "Remote Only" as the AppleTalk connection instead of Ethernet or Modem/Serial port.

Again, this extension will:

- Keep AppleTalk traffic off of LANS
- Free up the printer/modem/serial ports for other uses

Allow DAVE printing to work without any AppleTalk network.

Apple Speech Manager

The Speech Manager is a voice synthesizer for the Mac OS. Formerly known as Macintalk Pro, this is now installed by default by the Mac OS. If you do not have the the Speech Manager, it is also available on Apple web site (http://www.apple.com).
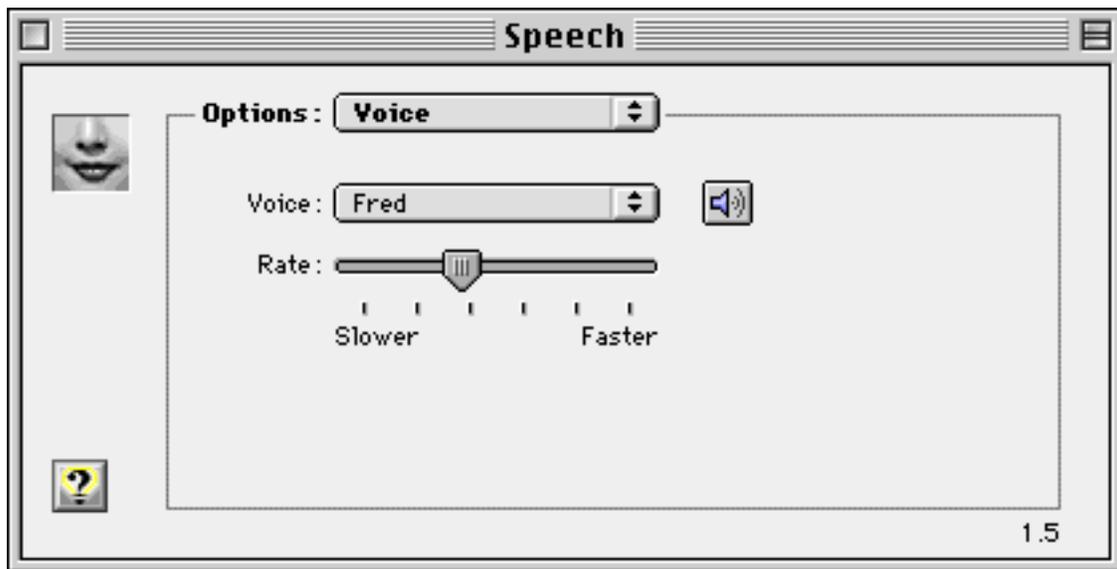

Figure F-3: Speech Manager

In recent versions of the Mac OS, the Speech Manager has an option called "Talking Alerts". When this option is enabled, the Mac OS will read any dialog that shows on the screen, including a displayed received message. When used in conjuntion with DAVE Access's "Read Messages Aloud" option this can result in your message being spoken twice.
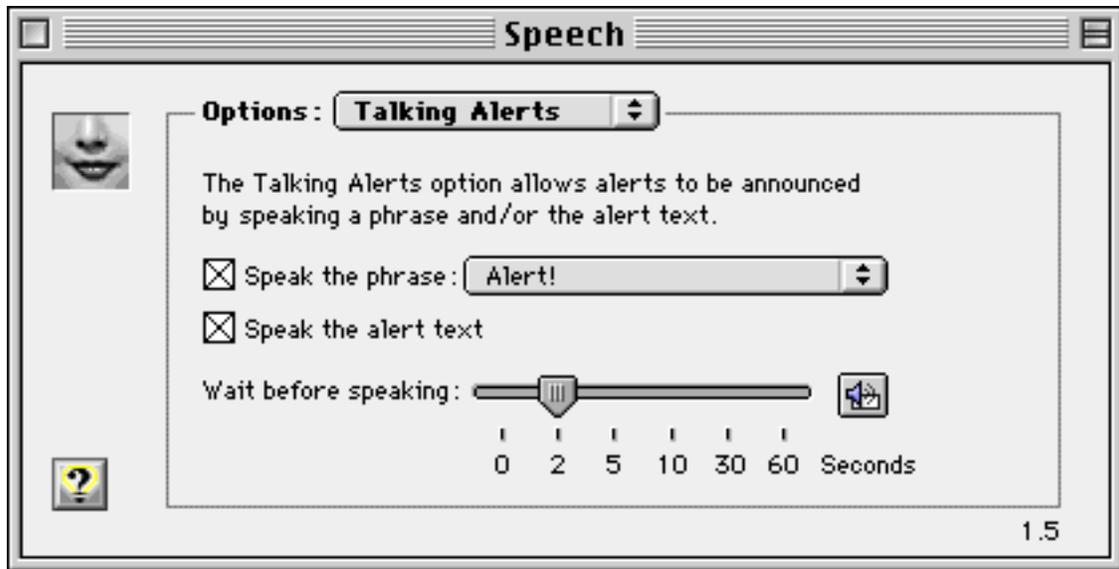
Figure F-4: Speech Manager Talking Alerts

AppleScript and the Script Editor

AppleScript is a system scripting extension for the Mac OS. With the script editor you can create "Scripts" to automate many system functions. The Script Editor is installed by default by the Mac OS installer on recent versions. Use your "Extension Manager" control panel to see if you have AppleScript installed. The "Script Editor" is installed into your "Apple Extras" folder by the Mac OS installer.

To create a new script, open up the Script Editor and begin typing. Here is a sample script you can use to test Apple Script:

```
Display Dialog "Hello World"
```

Type this script into the Script Editor and then run it. When you run it, it should display a dialog with the message "Hello World". You can save this script as an application which will runn when double-clicked.

DOS Mounter 95

DOS Mounter 95 from Software Architechs, Inc. (http://www.softarch.com). Provides much of the same functionality as PC Exchange.

Microsoft Windows NT's Services for Macintosh

Services for Macintosh is a service of Windows NT. When this service is running, files saved by non-Mac users to NTFS patitions (SFM does not work with FAT partitions) will

automatically receive type and creator information based on the the extension of the DOS filename. Files of an unknown extension will automatically receive a generic icon. This will have the effect of making PC Exchange appear to not work because the file will have a valid, albeit generic, icon when PC Exchange first encounters the file. You can edit SFM's settings by running the application File Manager (Start | Run | WINFILE.EXE) and choosing the "Associate…" command from the "MacFile" menu.

The MacFile information is stored in the registery in the following subkey:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\MacFile
For more information on Windows NT, the File Manager, RegEdit, or Services for Macintosh, please contact Microsoft.