



Enterprise

CHAPTER

## Macintosh Connectivity

# 20

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## About Chapter 20

**T**his chapter is all about Services for Macintosh, a Windows NT Server service that provides support for Macintosh client computers on a Windows NT Server network.

After presenting an overview of Macintosh client computer connectivity and Services for Macintosh, this chapter outlines how to install Services for Macintosh on a Windows NT Server computer. Next is an explanation of how to create a Macintosh-accessible volume on a Windows NT Server computer, so that Macintosh client computers can access the files contained in that volume. Following that is a discussion of how to enable password encryption for Macintosh client computers.

Finally, the chapter addresses Macintosh printing. This section explains how to share Windows NT printers with Macintosh client computers, as well as how to connect a Windows NT Server computer to an AppleTalk print device.

This chapter includes one hands-on lab. In this lab, you install and configure Services for Macintosh on your Windows NT Server computer.

Chapter 20 contains some valuable and interesting information, but is optional reading unless you're preparing for the Enterprise exam. This chapter maps to the protocol objectives (which include AppleTalk) and the "Configure a Windows NT Server computer for various types of client computers . . . including Macintosh" objective for the Enterprise exam.

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## Overview of Macintosh Client Connectivity and Services for Macintosh

Many mixed operating system networks include Macintosh client computers. Macintosh client computers use the AppleTalk protocol to communicate with servers and network-connected print devices that support the AppleTalk protocol.

Windows NT Server provides support for Macintosh client computers via *Services for Macintosh*. Services for Macintosh is a Windows NT Server (not Workstation) service.

Services for Macintosh allows:

- Macintosh client computers to connect to Macintosh-accessible volumes on a Windows NT Server computer
- Macintosh client computers to access shared printers on a Windows NT Server computer
- A Windows NT Server computer to connect to network-connected print devices that support the AppleTalk protocol
- A Windows NT Server computer to function as an AppleTalk router

The remaining sections in this chapter cover installing Services for Macintosh, creating a Macintosh-accessible volume, password encryption for Macintosh client computers, and Macintosh printing.

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## Installing Services for Macintosh

Services for Macintosh can be installed on any Windows NT Server computer that has 2MB of free disk space.

Services for Macintosh also requires that a supported network adapter be installed in the Windows NT Server computer. Supported network adapter types include LocalTalk, Ethernet, Token Ring, and FDDI. Services for Macintosh does *not* support ARCNET network adapters.

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TO INSTALL SERVICES FOR MACINTOSH ON A WINDOWS NT SERVER COMPUTER, FOLLOW THESE STEPS:

1. Select Start > Settings > Control Panel.
2. In the Control Panel dialog box, double-click the Network application.
3. In the Network dialog box, click the Services tab.
4. On the Services tab, click the Add command button.
5. In the Select Network Service dialog box, highlight Services for Macintosh, as shown in Figure 20-1. Click OK.

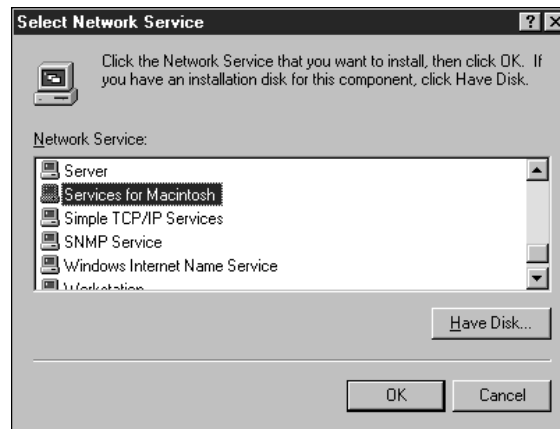


FIGURE 20-1 Installing Services for Macintosh

6. A Windows NT Setup dialog box appears. Ensure the correct path to your Windows NT Server source files (usually the I386 folder on your Windows NT Server compact disc) is listed in the text box. Edit this text box if necessary. Click the Continue command button.
7. Windows NT Server copies source files and installs Services for Macintosh.
8. The Network dialog box reappears. Click the Close command button.
9. Windows NT Server performs various bindings operations.
10. The Microsoft AppleTalk Protocol Properties dialog box appears, as shown in Figure 20-2. Notice that in this dialog box you can select a default network adapter and a default AppleTalk zone for this computer.
  - **Default Adapter:** Select the network adapter installed in the Windows NT Server computer that connects to the network segment that Macintosh client computers are connected to.

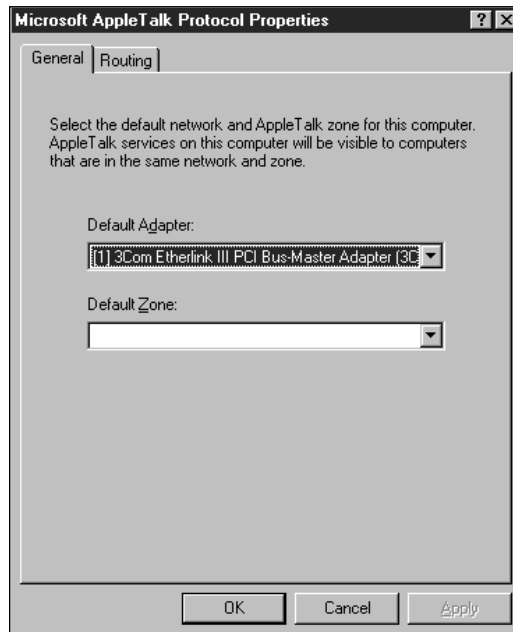
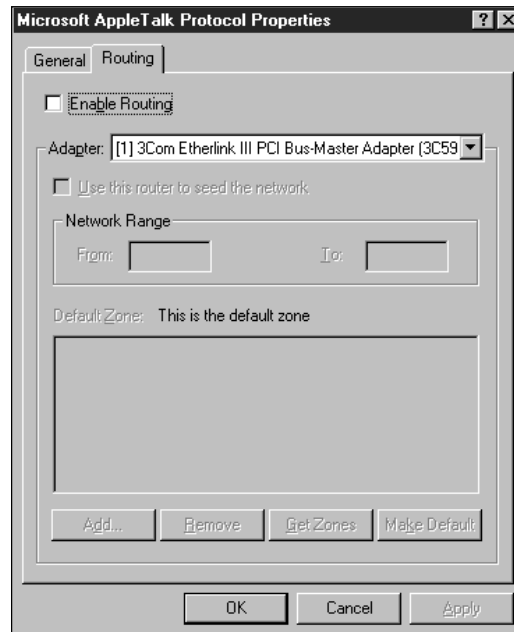


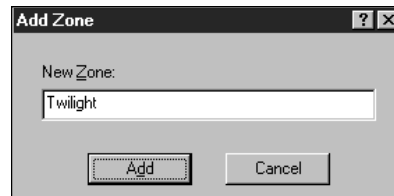
FIGURE 20-2 Configuring a default AppleTalk network adapter and zone

- **Default Zone:** A zone is a Macintosh term for a logical grouping of computers, much like a Windows NT workgroup. Select the zone that you want Services for Macintosh to be a part of. If no zones are listed, you can create a zone by configuring AppleTalk routing.
11. To configure AppleTalk routing, click the Routing tab, shown in Figure 20-3. There are several configurable options on the Routing tab:
- **Enable Routing:** To enable AppleTalk routing, select the check box next to Enable Routing.
  - **Use this router to seed the network:** If you select the check box next to Enable Routing, the "Use this router to seed the network" check box becomes available. If no zones were listed on the General tab, select this check box to create a zone (or zones) on your AppleTalk network.
  - **To create a zone:** If you select the check box next to "Use this router to seed the network", you will also need to enter a Network Range. Then click the Add command button to create a zone. The Add Zone dialog box appears. Type in the name of the zone you want to add.



**FIGURE 20-3** Configuring AppleTalk routing

Figure 20-4 shows the Add Zone dialog box after a new zone name has been entered.



**FIGURE 20-4** Creating a zone

Click the Add command button. The Routing tab reappears, as shown in Figure 20-5. Notice that the first zone I created is listed as the default zone. Add additional zones as needed. Click OK.

12. A Network Settings Change dialog box appears, indicating that you must shut down and restart the computer for the new settings to take effect. Click the Yes command button to restart the computer.

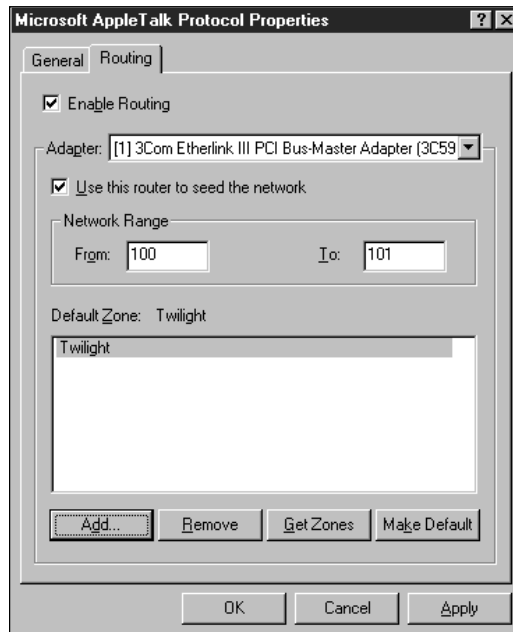


FIGURE 20-5 AppleTalk routing configured

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## Creating a Macintosh-Accessible Volume

A *Macintosh-accessible volume* is a folder on an NTFS partition (on a Windows NT Server computer) that permits Macintosh client computers to access the files contained in that folder. Services for Macintosh must be installed on the Windows NT Server computer before Macintosh-accessible volumes can be created.

After Macintosh-accessible volumes are created, they can also be shared with other types of client computers, such as Windows 95, Windows NT Workstation, and MS-DOS computers, so users of all these client computers can access the same files.

Macintosh-accessible volumes can be created by using Server Manager or File Manager. Macintosh-accessible volumes can be shared with other types of client computers by using Windows NT Explorer, Server Manager, or File Manager.

---

TO CREATE A MACINTOSH-ACCESSIBLE VOLUME BY USING SERVER MANAGER, FOLLOW THESE STEPS:

1. If the folder you want to use as a Macintosh-accessible volume already exists, skip to Step 5.  
If the folder you want to use as a Macintosh-accessible volume does *not* yet exist, select Start > Programs > Windows NT Explorer to create the folder.
2. The Exploring dialog box appears. In the All Folders list box, highlight the drive letter of the NTFS volume on which you want to create the Macintosh-accessible volume. Select File > New > Folder.
3. Rename the New Folder as desired and press Enter.
4. Exit Windows NT Explorer.
5. Select Start > Programs > Administrative Tools (Common) > Server Manager.
6. The Server Manager dialog box appears. Highlight your server in the list box and select MacFile > Volumes, as shown in Figure 20-6.

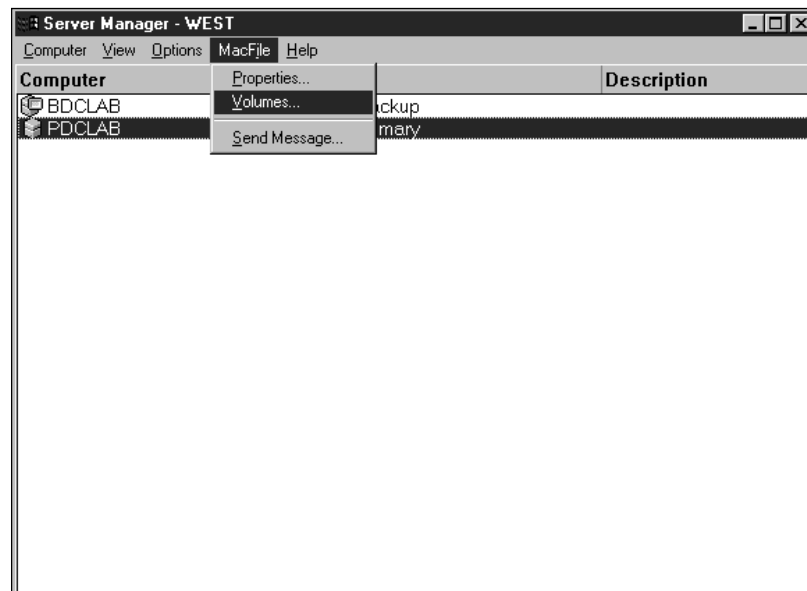


FIGURE 20-6 Macintosh file options in Server Manager

7. The Macintosh-Accessible Volumes dialog box appears, as shown in Figure 20-7. Notice that the Microsoft UAM Volume is listed in the Volumes list box. This volume is automatically created by Windows NT



Server during the installation of Services for Macintosh. Click the Create Volume command button.

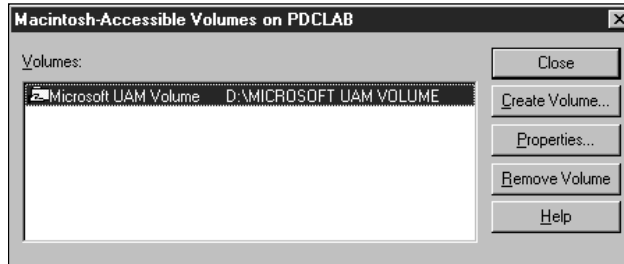


FIGURE 20-7 Managing Macintosh-accessible volumes

8. The Create Macintosh-Accessible Volume dialog box appears, as shown in Figure 20-8.

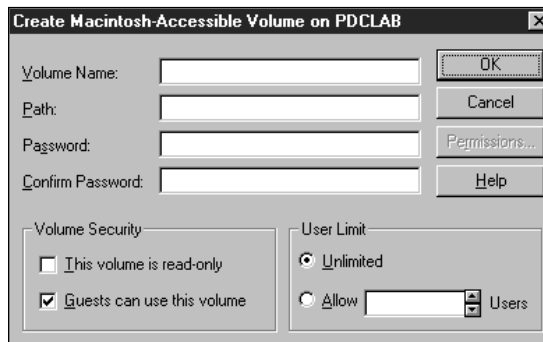
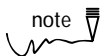


FIGURE 20-8 Creating a Macintosh-accessible volume

Type entries in the appropriate text boxes:

- **Volume Name:** Enter the name of the volume as you want it to appear to Macintosh client computers.
- **Path:** Enter the complete local path to the folder that will be used as the Macintosh-accessible volume. For example, D: \, or D: \MACFILES, and so on.



**note** You can specify an entire drive as a Macintosh-accessible volume. However, if you do this you *won't* be able to create additional Macintosh-accessible volumes on this drive within the existing Macintosh-accessible volume.

- **Password:** Enter the password that users of Macintosh client computers must specify to access this volume. This entry is optional.
- **Confirm Password:** Retype the password.

- **Volume Security:**

- **This volume is read-only:** Select the check box next to “This volume is read-only” if you don’t want users of Macintosh client computers to be able to save or delete files in this volume. This check box is not selected by default.
- **Guests can use this volume:** Clear the check box next to “Guests can use this volume” if you want to only allow users with Windows NT user accounts to access this volume. This check box is selected by default.

Click the Permissions command button if you want to assign Macintosh file and folder permissions to the Macintosh-accessible volume.  
Click OK.

9. The Macintosh-Accessible Volumes dialog box reappears. Click the Close command button.
10. The Server Manager dialog box reappears. Exit Server Manager.

---

If you want to share a Macintosh-accessible volume on a Windows NT Server computer with Windows 95, Windows NT Workstation, and/or MS-DOS client computers, use Windows NT Explorer, Server Manager, or File Manager to share the folder that contains the Macintosh-accessible volume.

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## Password Encryption for Macintosh Client Computers

By default, Macintosh client computers send passwords in clear text when they connect to a server. A Windows NT Server computer that has Services for Macintosh installed on it can permit this. However, clear text passwords can pose a network security risk because an unauthorized person could use a protocol analyzer to capture clear text passwords.

Services for Macintosh includes a *User Authentication Module* (UAM) that allows Macintosh client computers to send encrypted passwords when connecting to a Windows NT Server computer. Windows NT Server automatically creates the Microsoft UAM Volume (that contains the UAM) on the NT Server computer’s

first NTFS partition when Services for Macintosh is installed. If you are concerned about password security, you may want to enable password encryption on your Macintosh client computers.

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TO ENABLE PASSWORD ENCRYPTION ON A MACINTOSH CLIENT COMPUTER, FOLLOW THESE STEPS:

1. From the Macintosh client computer, connect to the Microsoft UAM Volume located on the Windows NT Server computer.
2. From the Macintosh desktop, double-click the Microsoft UAM Volume.
3. Drag the AppleShare Folder from the Microsoft UAM Volume and drop it on the System Folder on the Macintosh client computer. (This installs the UAM on the Macintosh client computer.)
4. Restart the Macintosh client computer.

---

This procedure must be performed on *every* Macintosh client computer that you want to enable password encryption on.



concept link

For more information on the Microsoft UAM, see the `ReadMe.UAM` text file located in the AppleShare Folder in the Microsoft UAM Volume.

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## Macintosh Printing

Services for Macintosh facilitates the integration of Windows NT and Macintosh printing environments.

When a Windows NT Server has Services for Macintosh installed on it:

- The Windows NT Server computer's shared printers are accessible from Macintosh client computers.
- The Windows NT Server computer can connect to network-connected AppleTalk print devices. (Additionally, after connecting, the NT Server computer can share these AppleTalk print devices with all client computers that access the Windows NT Server computer.)

The next two sections discuss sharing a Windows NT printer with Macintosh client computers and connecting to an AppleTalk print device.

## Sharing a Windows NT Printer with Macintosh Client Computers

When a Windows NT Server computer that has Services for Macintosh installed on it shares a printer, the printer is accessible to Macintosh client computers (as well as other client computers of the Windows NT Server computer).



**You don't have to reshare existing shared printers after installing Services for Macintosh to make them available to Macintosh client computers. Services for Macintosh makes *all* shared printers available to Macintosh client computers.**

A shared printer (on a Windows NT Server computer that has Services for Macintosh installed) advertises itself on the AppleTalk network as an Apple LaserWriter print device.

Macintosh client computers treat the shared printer as if it were an Apple LaserWriter print device. Apple LaserWriter is the original laser print device for Macintosh computers. All Macintosh computers have built-in drivers for the Apple LaserWriter. This means that Macintosh client computers don't need special drivers to access the shared printer on the Windows NT Server computer.

Macintosh client computers send print jobs formatted for an Apple LaserWriter (i.e., in PostScript) to the shared printer on the Windows NT Server computer. The Windows NT Server computer converts the PostScript print jobs it receives from Macintosh client computers into RAW format print jobs for the print device.



**For detailed instructions on how to share a printer, refer to the "Sharing a Printer" section in Chapter 6.**

## Connecting to an AppleTalk Print Device

Before you can connect a Windows NT Server computer to an AppleTalk print device, you must install Services for Macintosh.

A Windows NT Server computer can connect to any AppleTalk print device on any segment of a routed AppleTalk network.

To connect a Windows NT Server computer to an AppleTalk print device, create a printer that specifies the AppleTalk print device as its print destination. Creating this printer establishes a connection between the Windows NT Server computer and the AppleTalk print device. The next section explains, in more detail, how to accomplish this task.

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TO CONNECT A WINDOWS NT SERVER COMPUTER TO AN APPLETALK PRINT DEVICE, FOLLOW THESE STEPS:

1. Select Start > Settings > Printers.
2. The Printers dialog box appears. Double-click the Add Printer icon.
3. The Add Printer Wizard dialog box appears. To create a printer, select My Computer, and click Next.
4. In the Available ports list box, click the Add Port command button.
5. In the Printer Ports dialog box, highlight AppleTalk Printing Devices. Figure 20-9 shows the Printer Ports dialog box. Notice that AppleTalk Printing Devices is highlighted. Click the New Port command button.

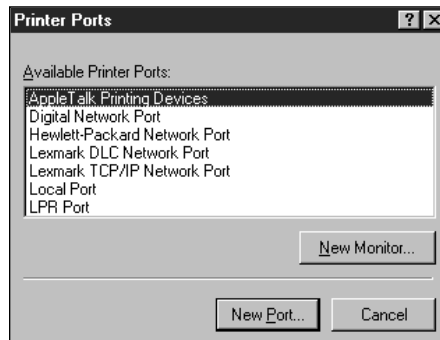


FIGURE 20-9 Adding an AppleTalk port

6. When the Available AppleTalk Printing Devices dialog box appears, double-click the AppleTalk zone that contains the print device you want to use. Or, if no zones are listed, highlight the AppleTalk print device you want to use. Figure 20-10 shows the Available AppleTalk Printing Devices dialog box, with an HP LaserJet 5P selected. Click OK.
7. A Windows NT dialog box appears, asking if you want to capture this AppleTalk print device.

If you choose to *capture* an AppleTalk print device, the AppleTalk print monitor will monopolize the connection to the AppleTalk print device, and

no other computer on the network will be able to access the AppleTalk print device. Additionally, the AppleTalk print monitor will instruct the AppleTalk print device *not* to advertise itself on the network. This is called *hiding*.



FIGURE 20-10 Selecting an AppleTalk print device



When you capture an AppleTalk print device, you should share the printer you're creating if you want to allow Macintosh (and other) client computers to be able to use this print device. If you *don't* share the printer, only the user sitting at the Windows NT Server computer will be able to access the AppleTalk print device.

If you choose *not to capture* an AppleTalk print device, all computers on the network will be able to access the AppleTalk print device for printing, because the connection to the print device will be dropped after each print job.

Click the Yes or No command button.

8. The Printer Ports dialog box reappears. Click the Close command button.
9. The Add Printer Wizard dialog box reappears. The Available Ports list box shows the newly created AppleTalk port highlighted and selected, as shown in Figure 20-11. Click the Next command button.
10. In the Add Printer Wizard dialog box, select the appropriate manufacturer and print device model. Click the Next command button.
11. In the Add Printer Wizard dialog box, type in a printer name, or accept the default. Click the Next command button.
12. In the Add Printer Wizard dialog box, choose whether or not to share the printer. (You can share or stop sharing the printer later if you change your mind.) If you choose to share the printer, accept the default share name or type in a new share name. Click the Next command button.

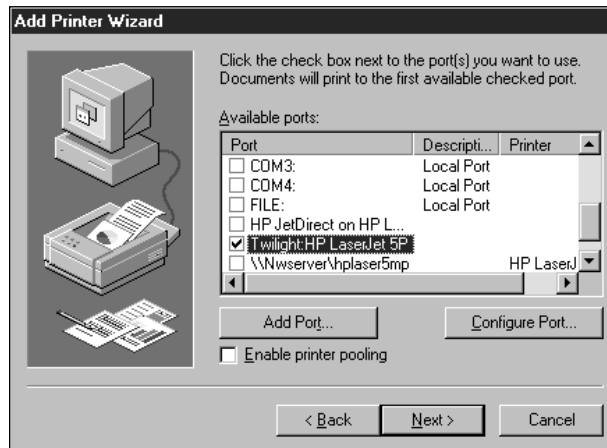


FIGURE 20-11 AppleTalk port created and selected

13. In the Add Printer Wizard dialog box, choose whether or not to print a test page. Click the Finish command button.
14. The Printers dialog box reappears with the newly created printer displayed in it. Close the Printers dialog box.

---

## Key Point Summary

This chapter presented the basics of Macintosh connectivity. The following points illuminate the major issues.

- Macintosh client computers use the AppleTalk protocol to communicate with servers and network-connected print devices that support the AppleTalk protocol. Windows NT Server provides support for Macintosh client computers via Services for Macintosh. Services for Macintosh is a Windows NT Server service.
- Services for Macintosh allows:
  - Macintosh client computers to connect to Macintosh-accessible volumes on a Windows NT Server computer
  - Macintosh client computers to access shared printers on a Windows NT Server computer

- A Windows NT Server computer to connect to network-connected print devices that support the AppleTalk protocol
- A Windows NT Server computer to function as an AppleTalk router
- Services for Macintosh can be installed on any Windows NT Server computer that has 2MB of free disk space. Services for Macintosh also requires that a supported network adapter be installed in the Windows NT Server computer. Supported network adapter types include LocalTalk, Ethernet, Token Ring, and FDDI. Services for Macintosh does *not* support ARCNET network adapters.
- A Macintosh-accessible volume is a folder on an NTFS partition (on a Windows NT Server computer) that permits Macintosh client computers to access files in that folder. After Macintosh-accessible volumes are created, they can also be shared with other types of client computers, such as Windows 95, Windows NT Workstation, and MS-DOS computers, so users of all of these client computers can access the same files. Macintosh-accessible volumes can be created by using Server Manager or File Manager.
- By default, Macintosh client computers send passwords in clear text when they connect to a server. A Windows NT Server computer that has Services for Macintosh installed on it can permit this. However, clear text passwords can pose a network security risk because an unauthorized person could use a protocol analyzer to capture them.
- Services for Macintosh includes a User Authentication Module (UAM) that allows Macintosh client computers to send encrypted passwords when connecting to a Windows NT Server computer. Windows NT Server automatically creates the `Microsoft UAM Volume` (that contains the UAM) when Services for Macintosh is installed.
- When a Windows NT Server computer that has Services for Macintosh installed on it shares a printer, the printer is accessible to Macintosh client computers (as well as other client computers of the Windows NT Server computer). You don't have to reshare existing shared printers after installing Services for Macintosh to make them available to Macintosh client computers—Services for Macintosh makes *all* shared printers available to Macintosh client computers. A shared printer (on a Windows NT Server computer that has Services for Macintosh installed) advertises itself on the AppleTalk network as an Apple LaserWriter print device.



- To connect a Windows NT Server computer (that has Services for Macintosh installed on it) to an AppleTalk print device, create a printer that specifies the AppleTalk print device as its print destination. Creating this printer establishes a connection between the Windows NT Server computer and the AppleTalk print device.

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## Applying What You've Learned

Now it's time to regroup, review, and apply what you've learned in this chapter.

The Instant Assessment questions bring to mind key facts and concepts. The hands-on lab exercise reinforces what you've learned, and allows you to practice some of the tasks tested by the Enterprise exam.

### Instant Assessment

1. What four network activities does Services for Macintosh allow?
2. List the types of network adapters supported by Services for Macintosh.
3. What type of network adapter is *not* supported by Services for Macintosh?
4. Which transport protocol is used by Macintosh client computers to connect to servers and network-connected print devices?
5. On what type of volume must a Macintosh-accessible volume be created?
6. Which Windows NT Server tool can you use to create a Macintosh-accessible volume?
7. By default, in what manner do Macintosh client computers send passwords when connecting to a Windows NT Server computer?
8. What component is included in Services for Macintosh that allows Macintosh client computers to send encrypted passwords when connecting to a Windows NT Server computer?
9. How does a shared printer (on a Windows NT Server computer that has Services for Macintosh installed) advertise itself on the AppleTalk network?
10. What should you do to connect a Windows NT Server computer (that has Services for Macintosh installed on it) to an AppleTalk print device?

T/F

11. Services for Macintosh can be installed on a Windows NT Workstation computer.



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For answers to the Instant Assessment questions see Appendix D.

## Hands-on Lab Exercise

The following hands-on lab exercise provides you with an opportunity to apply the knowledge you've gained in this chapter about Macintosh connectivity.

### Lab 20.33 *Installing and configuring Services for Macintosh*



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The purpose of this lab exercise is to give you hands-on experience in installing and configuring Services for Macintosh on a Windows NT Server computer.

This lab consists of two parts:

Part 1: Installing and configuring Services for Macintosh

Part 2: Configuring a Macintosh-accessible volume

Begin this lab by booting your computer to Windows NT Server. Log on as Administrator. Place your Windows NT Server compact disc in your computer's CD-ROM drive.

Follow the steps below carefully.

#### Part 1: Installing and configuring Services for Macintosh

In this section, you install and configure Services for Macintosh on a Windows NT Server computer.

1. Select Start > Settings > Control Panel.
2. In the Control Panel dialog box, double-click the Network application.
3. In the Network dialog box, click the Services tab.
4. On the Services tab, click the Add command button.
5. In the Select Network Service dialog box, highlight Services for Macintosh. Click OK.
6. A Windows NT Setup dialog box appears. Ensure that the correct path to your Windows NT Server source files (usually the I386 folder on your Windows NT Server compact disc) is listed in the text box. Edit this text box if necessary. Click the Continue command button.

7. Windows NT copies source files and installs Services for Macintosh.
8. The Network dialog box reappears. Click the Close command button.
9. Windows NT performs various bindings operations.
10. The Microsoft AppleTalk Protocol Properties dialog box appears. Click OK to continue.
11. A Network Settings Change dialog box appears, indicating that you must shut down and restart the computer for the new settings to take effect. Click the Yes command button to restart the computer.
12. Reboot your computer to Windows NT Server. Log on as Administrator. If the Control Panel dialog box appears, close it. Continue to Part 2.

## Part 2: Configuring a Macintosh-accessible volume

**In this section, you configure a Macintosh-accessible volume on an NTFS partition on a Windows NT Server computer.**

1. Select Start > Programs > Windows NT Explorer.
  2. The Exploring dialog box appears. Highlight your D: drive (or the drive where your NTFS volume is located) in the All Folders list box. Select File > New > Folder.
  3. In the Contents of D: list box, rename the New Folder **Macfiles** and press Enter.
  4. Exit Windows NT Explorer.
  5. Select Start > Programs > Administrative Tools (Common) > Server Manager.
  6. The Server Manager dialog box appears. Highlight your server in the list box and select MacFile > Volumes.
  7. The Macintosh-Accessible Volumes dialog box appears. Click the Create Volume command button.
  8. The Create Macintosh-Accessible Volumes dialog box appears. Type the following bolded information in the appropriate text boxes:
    - Volume Name—**MACFILES**
    - Path—**D:\MACFILES** (Or if your NTFS volume is located on another drive, use the drive letter for your NTFS volume.)
    - Password—Leave this text box blank.
    - Confirm Password—Also leave this text box blank.
- Click OK.

9. The Macintosh-Accessible Volumes dialog box reappears. Notice that `MACFILES` appears in the Volumes list box as a shared Macintosh volume. Click the Close command button.
10. The Server Manager dialog box reappears. Exit Server Manager.