



Workstation
Server
Enterprise

CHAPTER

Server-Based Deployment

5

What Is Server-Based Deployment?	175
Preparing for Server-Based Deployment	176
Using Network Client Administrator	177
Creating an Installation Disk Set	178
Creating a Network Installation Startup Disk	179
Automating Setup of Windows NT	182
Creating and Using Answer Files (Unattend.txt)	183
Using Setup Manager	185
Using Uniqueness Database Files	187
Automating Application Installation During Setup	189
The \$OEM\$ Subfolder	189
Using Sysdiff.exe	190
Key Point Summary	191
Applying What You've Learned	193
Instant Assessment	193
Hands-on Lab Exercise	194
Lab 5.7 Creating an answer file using Setup Manager	195



About Chapter 5

This chapter tackles the subject of server-based deployment — the process of automating the installation and setup of Windows NT on multiple computers at a time, either at the factory or on a private network.

First, the chapter addresses what you need to do to prepare for server-based deployment. Complete instructions for this part of the process are outlined.

Next, Chapter 5 introduces *Network Client Administrator*, a Windows NT Server tool you can use to create an installation disk set, or to create a network installation startup disk.

Next, you'll discover how to create answer files and Uniqueness Database Files to fully automate the Windows NT installation and setup process.

Finally, this chapter addresses how to automate the installation of applications during an automated installation of Windows NT. The \$OEM\$ subfolder and Sysdiff.exe are introduced in this section.

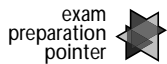
This chapter includes a hands-on lab that will familiarize you with the use of Setup Manager to create an answer file.

This chapter is a "must read," no matter which of the three Windows NT 4.0 Microsoft Certified Professional exams you're preparing for. The information in this chapter covers various objectives listed in the Planning and Installation and Configuration sections in these exams' objectives.

What Is Server-Based Deployment?

Server-based deployment is a process that involves automating the installation and setup of Windows NT, other operating systems (Windows 95 and Windows for Workgroups), and applications on multiple computers on a network.

This process is primarily designed for rolling out large networks quickly and efficiently.



The Windows NT Workstation exam has objectives in both the Planning and Installation and Configuration sections that concern server-based deployment. Because you are unlikely to use server-based deployment very often in real life (unless you manage a large network), I recommend you study this chapter carefully, and revisit it just before you take the Workstation exam. I'd like to tell you to just study one or two sections, but the truth is, the whole chapter's fair game on the exam.

Both the Server and Enterprise exams have an objective that concerns configuring a Windows NT Server computer for various types of client computers. This objective ties in to the "Using Network Client Administrator" section of this chapter, and deserves your attention.

In server-based deployment, source files are placed on a centrally located Windows NT Server computer. Then floppy disks are created which, when run on the computers that need to be set up, cause these computers to automatically connect to the server and to run a partially or fully automated installation and setup routine.

Server-based deployment is commonly used in two types of environments. First, *original equipment manufacturers* (OEMs) use this process to install and configure large numbers of computers at the factory prior to shipping these computers to customers and retail outlets. Second, organizations that install a new network or add several new computers to an existing network use this process to install operating systems and applications on their new computers in an efficient manner.



Using server-based deployment can save you a significant amount of time. Consider using it when you have five or more identical installs to perform.

Before you can use server-based deployment, you must prepare the Windows NT Server computer that will store the source files used in this process.

Preparing for Server-Based Deployment

To prepare your Windows NT Server computer for server-based deployment, you need to place the appropriate files on this server in a prescribed format.

To begin the preparation, copy the `Clients` folder, including all files and subfolders, from your Windows NT Server compact disc to one of the drives on the Windows NT Server computer. This drive must have enough free space to hold the entire contents of the `Clients` folder and the source files for any additional operating systems and applications you want to install using server-based deployment.

Then share the `Clients` folder on the Windows NT Server computer as `CLIENTS`. At this point, if the only operating system you want to deploy is Windows 95, you are finished preparing your Windows NT Server computer. If you want to deploy other operating systems, follow the steps below for *each* operating system you want to deploy.

TO PREPARE YOUR WINDOWS NT SERVER COMPUTER FOR SERVER-BASED DEPLOYMENT OF WINDOWS FOR WORKGROUPS, FOLLOW THESE STEPS:

1. Create a subfolder in the `Clients` folder named `Wfw`.
2. Create a subfolder in the `Clients\Wfw` folder named `Netsetup`.
3. Copy the Windows for Workgroups installation files from your source media (compact disc or floppy disk) to the `Netsetup` folder.

TO PREPARE YOUR WINDOWS NT SERVER COMPUTER FOR SERVER-BASED DEPLOYMENT OF WINDOWS NT WORKSTATION, FOLLOW THESE STEPS:

1. Create a subfolder in the `Clients` folder named `Winnt`.
2. Create a subfolder in the `Clients\Winnt` folder named `Netsetup`.
3. Copy the Windows NT Workstation installation files and subfolders from the `I386` folder on your Windows NT Workstation compact disc to the `Netsetup` folder.

TO PREPARE YOUR WINDOWS NT SERVER COMPUTER FOR SERVER-BASED DEPLOYMENT OF WINDOWS NT SERVER, FOLLOW THESE STEPS:

1. Create a subfolder in the `Clients` folder named `Winnt.srv`.
2. Create a subfolder in the `Clients\Winnt.srv` folder named `Netsetup`.
3. Copy the Windows NT Server installation files and subfolders from the `I386` folder on your Windows NT Server compact disc to the `Netsetup` folder.



Now that you've prepared your Windows NT Server computer, you're ready to use the Network Client Administrator tool to proceed with the server-based deployment process.

Using Network Client Administrator

Network Client Administrator is a Windows NT Server tool that you can use to create an *installation disk set* to install network clients or services on client computers.

You can also use Network Client Administrator to create a *network installation startup disk*. A network installation startup disk, when run on a computer that needs to be set up (the *target computer*), causes the target computer to automatically connect to the server and start an interactive installation/setup routine.

Creating an Installation Disk Set

You can use Network Client Administrator to create an installation disk set to install network clients or services on client computers.

For example, suppose you want to install TCP/IP on several Windows for Workgroups computers. You can use Network Client Administrator to create a TCP/IP installation disk set, and then use this disk set on each computer on which you want to install TCP/IP.

The network clients and services that you can create an installation disk set for are: Network Client v3.0 for MS-DOS and Windows, Remote Access v1.1a for MS-DOS, TCP/IP 32 for Windows for Workgroups 3.11, LAN Manager v2.2c for MS-DOS, and LAN Manager v2.2c for OS/2.

TO CREATE AN INSTALLATION DISK SET, FOLLOW THESE STEPS:

1. Boot your computer to Windows NT Server. Select Start > Programs > Administrative Tools (Common) > Network Client Administrator.
2. The Network Client Administrator dialog box appears, as shown in Figure 5-1. Notice that the radio button next to Make Network Installation Startup Disk is selected. Click the radio button next to Make Installation Disk Set. Click Continue.

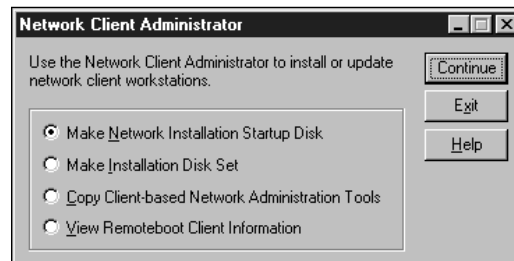


FIGURE 5-1 Using Windows NT Server Network Client Administrator

3. Click the radio button next to Use Existing Shared Directory in the Share Network Client Installation Files dialog box. Type in the name of the Windows NT Server that you are using for server-based deployment for the Server Name. Type **clients** for the Share Name. Click OK.
4. In the drop-down list box in the Make Installation Disk Set dialog box, scroll down and select the network client or service for which you want to create

an installation disk set. This dialog box is shown in Figure 5-2. Notice that I have selected the TCP/IP 32 for Windows for Workgroups 3.11 network service. Click OK.

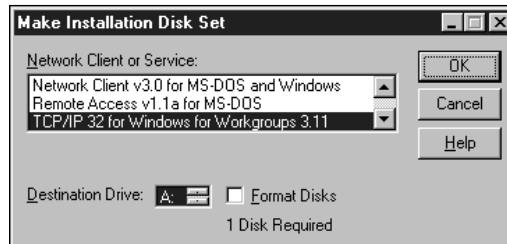


FIGURE 5-2 Creating an installation disk set

5. Windows NT prompts you to insert one to four floppy disks, depending on the network client or service you selected. (These disks will become the installation disk set.) Use blank disks for this procedure, even though NT indicates a specifically named disk should be inserted. Insert a disk and click OK.
6. Windows NT creates the installation disk set.

Creating a Network Installation Startup Disk

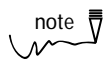
You can use Network Client Administrator to create a network installation startup disk.

For example, suppose you want to install Windows NT Workstation on several new client computers on your network. You can use Network Client Administrator to create a single disk that you can use on each of the new client computers to automatically begin an interactive, over-the-network installation of Windows NT Workstation.

You can create a network installation startup disk that can be used to install any of the following operating systems: Windows for Workgroups, Windows 95, Windows NT Workstation, or Windows NT Server. (A separate disk is required for each different operating system.)

TO CREATE A NETWORK INSTALLATION STARTUP DISK, FOLLOW THESE STEPS:

1. Boot your computer to Windows NT Server. Select Start > Programs > Administrative Tools (Common) > Network Client Administrator.
2. The Network Client Administrator dialog box appears. Ensure the radio button next to Make Network Installation Startup Disk is selected. Click Continue.
3. Click the radio button next to Use Existing Shared Directory in the Share Network Client Installation Files dialog box. Type in the name of the Windows NT Server you are using for server-based deployment for the Server Name. Type **clients** for the Share Name. Click OK.
4. The Target Workstation Configuration dialog box appears. In the Network Client list box, highlight the client or operating system for which you want to create a network installation startup disk. In the Network Adapter Card drop-down list box, select the network adapter that is installed in the target computer. (The target computer is the computer on which you want to install a new operating system.) Figure 5-3 shows the Target Workstation Configuration dialog box. Notice that Windows NT Workstation and a 3Com EtherLink III network adapter card have been selected. Click OK.

 **You may be wondering, at this point, if the network installation startup disk works only on computers that have identical network adapters installed in them. Yep. That's how it is. You must create a separate network installation startup disk for each network adapter/operating system combination you plan to install.**

5. A warning message appears, indicating that a license for Windows NT Workstation must be purchased prior to installing and using this operating system. Click OK.
6. The Network Startup Disk Configuration dialog box appears. Type in a computer name that will be used by the target computer during the installation process. Type in a user name to be used to log on to the Windows NT Server from the target computer during the installation process. Type in the domain name that the user account is maintained in. Select a network protocol to be used during the installation process. Enter any configuration values needed for this protocol (IP address, subnet mask, default gateway, and so on). Click OK when you are finished. Figure 5-4 shows the Network Startup Disk Configuration dialog box. Note that all text boxes have been completed.

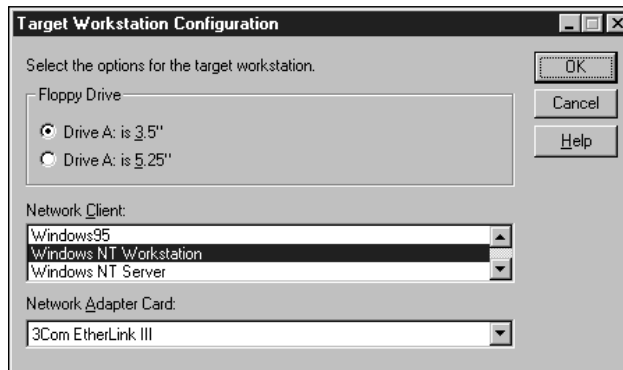


FIGURE 5-3 Creating a network installation startup disk

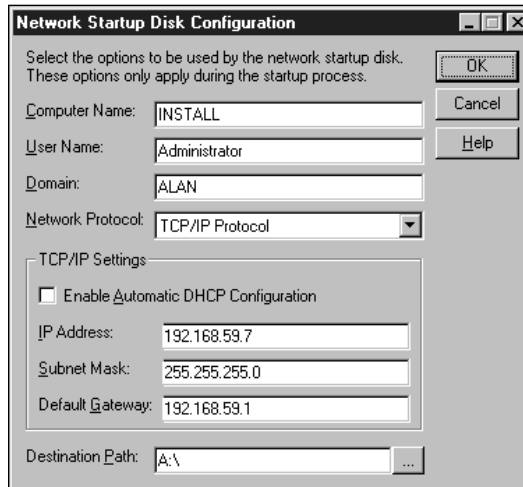


FIGURE 5-4 Configuring network installation startup disk options

7. The Confirm Network Disk Configuration dialog box appears. Figure 5-5 shows this dialog box. Note that NT requires you to insert a formatted, high-density floppy disk. This disk *must* be formatted as an MS-DOS system disk. (This can be accomplished on any computer that runs MS-DOS by using the `FORMAT /s` command.) Insert a formatted system disk and click OK to continue.

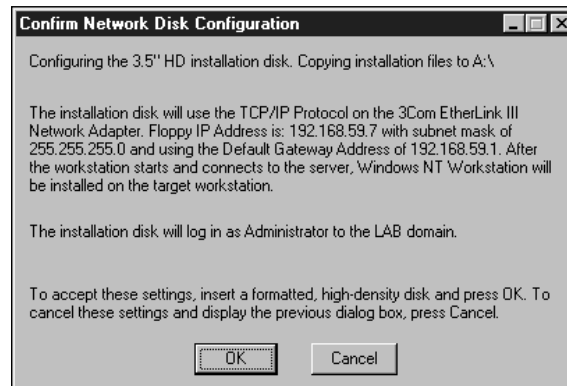


FIGURE 5-5 Confirming network startup disk configuration

8. Windows NT creates the over-the-network installation startup disk. The network installation startup disk is now configured for the operating system you selected. To start an interactive installation, boot the target computer by using the network installation startup disk.

To fully automate the Windows NT installation and setup process, you must create an answer file to be used by the Windows NT setup program, and you must edit the `Autoexec.bat` file on the network installation startup disk so that it uses this answer file during the installation. The next section discusses, in detail, automating the Windows NT installation and setup process.

Automating Setup of Windows NT

Until now, you have learned how to automate the start of an interactive Windows NT installation process by creating a network installation startup disk. Now you'll discover how to create and use answer files (`Unattend.txt`) and Uniqueness Database Files (UDFs) to fully automate the Windows NT installation and setup process.

Creating and Using Answer Files (Unattend.txt)

Answer files are text files that contain stylized responses to the queries posed by the Windows NT Setup program during installation. You can use an answer file, in conjunction with a network installation startup disk (discussed in the previous section), to fully automate the installation of Windows NT on a single computer (that is, perform an unattended installation). The default name for an answer file is `Unattend.txt`, but you can use any filename you want for your answer files. Listing 5-1 presents a sample answer file.

LISTING 5-1 Sample Unattend.txt file

```
[Unattended]
OemPreinstall = yes
NoWaitAfterTextMode = 1
NoWaitAfterGUIMode = 1
FileSystem = ConvertNTFS
ExtendOEMPartition = 0
ConfirmHardware = no
NtUpgrade = no
Win31Upgrade = no
TargetPath = *
OverwriteOemFilesOnUpgrade = no
KeyboardLayout = "US"

[UserData]
FullName = "MCSE Candidate"
OrgName = "MCSE Candidates Company"
ComputerName = NTW2
ProductId = "975-4769754"

[GuiUnattended]
OemSkipWelcome = 1
OEMBlankAdminPassword = 1
TimeZone = "(GMT-08:00) Pacific Time (US & Canada); Tijuana"

[Display]
ConfigureAtLogon = 0
```

```

BitsPerPel = 8
XResolution = 800
YResolution = 600
VRefresh = 60
AutoConfirm = 1

[Network]
DetectAdapters = ""
InstallProtocols = ProtocolsSection
InstallServices = ServicesSection
InstallInternetServer = InternetParamSection
JoinDomain = LAB
CreateComputerAccount = administrator, password

[ProtocolsSection]
TC = TCPParamSection

[TCPParamSection]
DHCP = no
IPAddress = 192.168.59.7
Subnet = 255.255.255.0
Gateway = 192.168.59.1

[ServicesSection]

```

There are two ways you can create an answer file. You can use any text editor, such as Notepad, to type in all of the appropriate responses in the correct format. Or, you can use Windows NT Setup Manager (*Setupmgr.exe*) to create an answer file, which is the easiest and preferred method.



concept link

For additional information on the format and content of answer files, see **Appendix A** of the *Microsoft Windows NT Workstation Resource Kit for version 4.0* (Microsoft Press, 1996). For detailed, step-by-step instructions for using Setup Manager to create an *Unattend.txt* file, see **Lab 5.7** at the end of this chapter.

To use an answer file, run the Windows NT Setup program (*Winnt.exe* or *Winnt32.exe*) with the **/U** switch.

For example, to use an answer file from the command line, you can type:

```
Z:\Winnt\Netsetup\Winnt.exe /U:Z:\Winnt\Netsetup\Unattend.txt  
/S:Z:\Winnt\ Netsetup
```

In this example, `Winnt.exe` starts the installation process with the unattended switch (`/U`) to specify that `Winnt.exe` will use a specific answer file (`Z:\Winnt\Netsetup\Unattend.txt`). `Winnt.exe` uses the `/S` switch to specify that the source folder for all Windows NT Workstation files is `Z:\Winnt\Netsetup`.

Using the command line is one way to start the installation process with an answer file. Another more efficient way is using the network installation startup disk in conjunction with an answer file to fully automate the installation of Windows NT on a single computer. To do this, you must first edit the `Autoexec.bat` file on the network installation startup disk by using Notepad or any other text editor.

For example, the last line of the `Autoexec.bat` file on a network installation startup disk that has been created for a Windows NT Workstation installation, *before* editing, is normally: `Z:\Winnt\Netsetup\Winnt.exe /B /S:Z:\Winnt\Netsetup`

To use the startup disk in conjunction with an answer file, you should edit this line so that it reads: `Z:\Winnt\Netsetup\Winnt.exe /U:Z:\Winnt\Netsetup\Unattend.txt /S:Z:\Winnt\Netsetup`



In practice, it often takes several attempts to correctly configure a network installation startup disk and an answer file. I recommend you try these out on a test computer prior to deploying them live on your network.

Now that you understand what an answer file is and how it is used, it's time to discuss how to create an answer file by using Setup Manager.

Using Setup Manager

Windows NT Setup Manager (`Setupmgr.exe`) is a graphical tool that provides an easy way to create an answer file (`Unattend.txt`) that you can use to install Windows NT in unattended mode.

Setup Manager is located on the Windows NT Server (or Windows NT Workstation) compact disc. You can find it in the `\Support\Deptools\I386` folder (for Intel-based computers). To start Setup Manager, double-click `Setupmgr.exe` in Windows NT Explorer.

When you start Setup Manager, the Windows NT Setup Manager main dialog box appears, as shown in Figure 5-6. Notice that you can choose from three options: General Setup, Networking Setup, and Advanced Setup.



FIGURE 5-6 Windows NT Setup Manager main dialog box

The *General Setup* options in Windows NT Setup Manager are used to configure the user information, computer role, installation directory, display settings, time zone, and license mode entries in an answer file.

The *Networking Setup* options in Windows NT Setup Manager are used to configure the adapters, protocols, services, Internet, and modem entries in answer file.

The *Advanced Setup* options in Windows NT Setup Manager are used to configure the file system, mass storage, display driver, keyboard, pointing device, and boot files entries in an answer file.



concept link

Lab 5.7 takes you through the process of using Setup Manager to create an `Unattend.txt` file.

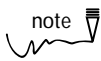
Using Uniqueness Database Files

Uniqueness Database Files (UDFs) are text files, similar to answer files, that make it possible for one answer file to be used for the installation of many computers with different identifying characteristics. For example, each computer has a different computer name and user name. A UDF, used in conjunction with a network installation startup disk and an answer file, makes it possible to fully automate the installation of Windows NT on multiple computers on a network.

The UDF is structured like an answer file, and uses the same types of entries that an answer file uses. The UDF has an additional section, named `[UniqueIds]`. When the appropriate command-line switch is used, selected entries in the UDF replace entries with the same name in the answer file.

The only types of entries you can't use in a UDF are entries that are used during the text-mode portion (Phase 1) of the installation routine. In other words, entries from the following section headings *must* be specified in the answer file — they can't be used in a UDF:

- `[Unattended]`
- `[OEMBootFiles]`
- `[MassStorageDrivers]`
- `[KeyboardDrivers]`
- `[PointingDeviceDrivers]`



If you have computers with different hard disk controllers, keyboards, or mice, you must use a different answer file for each hardware configuration.

Listing 5-2 presents a sample UDF named `Authors.txt`.

LISTING 5-2 Sample UDF, `Authors.txt`

```
[UniqueIds]
Wshakespeare = Wshakespeare:UserData
Sclements = Sclements:UserData
Hmelville = Hmelville:UserData

[Wshakespeare:UserData]
FullName = "William Shakespeare"
OrgName = "Playwrights, Inc."
```

```

ComputerName = Willie
ProductId = "975-4769755"

[Sclements:UserData]
FullName = "Samuel Clements"
OrgName = "The Mark Twain Book Company"
ComputerName = Huck
ProductId = "975-4769756"

[Hmelville:UserData]
FullName = "Herman Melville"
OrgName = "A Whale of a Story, Inc."
ComputerName = Moby
ProductId = "975-4769757"

```

Notice in the Authors.txt UDF that the names listed in the [UniqueIds] section map to the other section headings in the UDF.

Using the Authors.txt UDF file as an example, assume that you want to use a UDF, an answer file, and a network installation startup disk to install Windows NT Workstation on Samuel Clements's computer. To configure the network installation startup disk, you must edit the last line of the Autoexec.bat file on this disk so that it reads as follows:

```

Z:\Winnt\Netsetup\Winnt.exe /U:Z:\Winnt\Netsetup\Unattend.txt
/S:Z:\Winnt\Netsetup /UDF:Sclements, Authors.txt

```

This command instructs Winnt.exe to use the entries in the [Sclements:UserData] section of the Authors.txt UDF to replace the entries with the same name in the answer file during the installation. In this case, the user name, organization name, computer name, and product ID specified in the [Sclements:UserData] section of the Authors.txt UDF is used during the installation of Windows NT Workstation; and the user name, organization name, computer name, and product ID specified in the answer file is disregarded.

A UDF can specify that more than one section in a UDF is to be associated with a unique identifier (UniqueId). Continuing along the same line as the previous example, you could specify in the [UniqueIds] section of a UDF that:

```

Wshakespeare = Wshakespeare:UserData, Protocols1

```

This line indicates that the UniqueID Wshakespeare is associated with two sections in the UDF: [Wshakespeare:UserData] and [Protocols1]. The [Wshakespeare:UserData] section contains user specific information, and the

[Protocols1] section contains an alternate list of protocols to be installed on William Shakespeare's computer. During installation, Winnt.exe will use the entries contained in [Wshakespeare:UserData] and [Protocols1] instead of the same-named entries in the answer file.



concept link

For additional information on UDFs, see Chapter 2 and Appendix A of the *Microsoft Windows NT Workstation Resource Kit*.

Automating Application Installation During Setup

In addition to automating the installation of Windows NT, you may also want to automate the installation of various applications at the same time.

In this section, you'll learn how the \$OEM\$ subfolder and Sysdiff.exe can be used to automatically install applications at the end of the automated installation/setup process.

The \$OEM\$ Subfolder

The \$OEM\$ subfolder is used to store source files that are used to install applications, components, or files that do not ship with Windows NT.

You must create the \$OEM\$ subfolder—it does not exist as part of Windows NT distribution files.

To create a \$OEM\$ subfolder to use in conjunction with an automated installation/setup of Windows NT Workstation, create the \$OEM\$ subfolder in the Clients\Winnt\Netsetup folder.

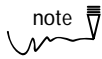
To create a \$OEM\$ subfolder to use in conjunction with an automated installation/setup of Windows NT Server, create the \$OEM\$ subfolder in the Clients\Winnt.srv\Netsetup folder.

You can use the \$OEM\$ subfolder to store source files of applications that support scripted installation. Scripted installation enables complete installation of an application from a single command line. Most Microsoft applications support scripted installation.

For example, to prepare for automated installation of a scripted application (in conjunction with a Windows NT Workstation automated installation) on your computer's C: drive, first create a \$OEM\$ subfolder in the Clients\Winnt\Netsetup folder. Then create a subfolder named C in the \$OEM\$ folder, and a subfolder named *name_of_application* in the \$OEM\$\C folder. Then copy the application's source files, including all subfolders, to the Clients\Winnt\Netsetup\\$OEM\$\C\name_of_application folder. Then, create a Cmdlines.txt file in the \$OEM\$ subfolder that uses the following syntax:

```
[Commands]
```

```
"complete command line to install the application"
```



The use of quotation marks to surround the command line is required in the Cmdlines.txt file.

Finally, you must edit the answer file to instruct Winnt.exe to execute the commands in the Cmdlines.txt file. (Otherwise, Winnt.exe ignores the \$OEM\$ subfolder and all of its contents during automated installation.) Edit the [Unattended] section of the answer file to include the following entry:

```
OemPreinstall = yes
```

concept link



For additional information on the \$OEM\$ subfolder, see Chapter 2 of the *Microsoft Windows NT Workstation Resource Kit*.

Applications that don't support scripted installation can be installed by using Sysdiff.exe. Using Sysdiff.exe is discussed in the next section.

Using Sysdiff.exe

Sysdiff.exe is used to automate the installation of applications that don't support scripted installation and that would otherwise require user interaction during the installation process.

Sysdiff.exe is located on the Windows NT Server (or Windows NT Workstation) compact disc. You can find it in the \Support\Deptools\I386 folder (for Intel-based computers).

Sysdiff.exe can be used to perform these three major functions:

1. When run with the /snap switch, it takes a snapshot of a typical target computer's current configuration after Windows NT is installed but before any applications are installed.

2. When run with the `/diff` switch after the desired application is installed, it creates a difference file that contains all of the application files and registry changes.
3. When run with the `/apply` switch from the `Cmddlines.txt` file, it applies the difference file during an unattended Windows NT installation.



concept link

For additional information on using `Sysdiff.exe`, see Chapter 2 of the *Microsoft Windows NT Workstation Resource Kit* and *Microsoft TechNet*.

Key Point Summary

Chapter 5 introduced *server-based deployment*, a process that involves automating the installation and setup of Windows NT, other operating systems (Windows 95 and Windows for Workgroups), and applications on multiple computers on a network.

- You must prepare the Windows NT Server computer that you will use for the server-based deployment process by copying the `Clients` folder from the Windows NT Server compact disc to this computer. Then you share the `Clients` folder as `CLIENTS`, and modify this folder depending on the operating system(s) you want to install.
- *Network Client Administrator* is a Windows NT Server tool that you can use to create an installation disk set and a network installation startup disk. An *installation disk set* is used to install network clients or services on client computers. A *network installation startup disk*, when run on a computer that needs to be set up (the target computer), causes the target computer to automatically connect to the Windows NT Server computer and start an interactive installation/setup routine.
- Automating the setup of Windows NT involves creating an *answer file* and *Uniqueness Database File* (UDF) that enable you to fully automate the Windows NT installation and setup process. An answer file is a text file that contains stylized responses to the queries posed by the Windows NT Setup program during installation. The default name for an answer file is `Unattend.txt`. The easiest way to create an answer file is to use Windows

NT Setup Manager (Setupmgr.exe). To use an answer file, run the Windows NT Setup program with the /U switch. A Uniqueness Database File (UDF) is a text file, similar to an answer file, that allows one answer file to be used for the installation of many computers that have different identifying characteristics (different computer names, user names, and so on). When used in conjunction with a network installation startup disk and an answer file, a UDF makes it possible to fully automate the installation of Windows NT on multiple computers on a network. If you have computers with different hard disk controllers, keyboards, or mice, you must use a different answer file for each hardware configuration, because these entries can only be specified in an answer file, not in a UDF. When the appropriate command-line switch is used, selected entries in the UDF replace same-named entries in the answer file.

- o In addition to automating the installation of Windows NT, you may want to automate the installation of various applications at the same time. The \$OEM\$ subfolder is used to store source files that are used to install scripted applications, components, or files that do not ship with Windows NT. Scripted applications are those that permit complete installation from a single command line. Create the \$OEM\$ subfolder in the Clients\Winnt\Netsetup folder to use in conjunction with an automated installation of Windows NT Workstation. Create the \$OEM\$ subfolder in the Clients\Winnt.srv\Netsetup folder to use in conjunction with an automated installation of Windows NT Server.
- o Sysdiff.exe is used to automate the installation of applications that don't support scripted installation, and that otherwise would require user interaction during the installation process. Sysdiff.exe can be used to perform these three major functions:
 - o When run with the /snap switch, Sysdiff.exe takes a snapshot of a typical target computer's current configuration after Windows NT is installed but before any applications are installed.
 - o When run with the /diff switch after the desired application is installed, Sysdiff.exe creates a difference file containing all of the application files and Registry changes.
 - o When run with the /apply switch from the Cmdlines.txt file, Sysdiff.exe applies the difference file during an unattended Windows NT installation.

Applying What You've Learned

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

The questions in the Instant Assessment section that follows bring to mind key facts and concepts. In addition, some of the questions give you a chance to analyze situations and apply your knowledge of Windows NT to that particular situation.

The hands-on lab exercise will really reinforce what you've learned, and provide you an opportunity to practice several of the tasks tested by the Microsoft Certified Professional exams.

Instant Assessment

1. What is server-based deployment?
2. What is the primary reason for using server-based deployment?
3. What are the two types of environments in which server-based deployment is commonly used?
4. Which folder must be copied from the Windows NT Server compact disc to the Windows NT Server computer that will be used for server-based deployment?
5. You are preparing a Windows NT Server computer to use in deploying Windows NT Workstation to several client computers. You copy the `Clients` folder from the Windows NT Server compact disc to one of the drives on the Windows NT Server computer. What two additional subfolders must you create in the `Clients` folder?
6. You are preparing a Windows NT Server computer to use in deploying Windows NT Server to several other computers. You copy the `Clients` folder from the Windows NT Server compact disc to one of the drives on the Windows NT Server computer. What two additional subfolders must you create in the `Clients` folder?
7. You want to install TCP/IP 32 for Windows for Workgroups 3.11 on twenty computers on your network. What can you create, using Network Client Administrator, to help you accomplish this task efficiently?
8. You are rolling out a new network for a company, and want to install Windows NT Workstation on fifty new client computers. What can you

create, using Network Client Administrator, to help you accomplish this task efficiently?

9. What is an answer file?
10. What is the easiest way to create an answer file?
11. What switch must you use with the Windows NT Setup program to ensure that an answer file will be utilized?
12. Where is Windows NT Setup Manager (`Setupmgr.exe`) located?
13. Fill in the blank: When the appropriate command-line switch is used, selected entries in the UDF _____ same-named entries in the answer file.
14. You want to use UDFs in conjunction with a network installation startup disk and answer files to automate the installation of Windows NT on multiple computers on your network. However, several of the computers on your network have different hard disk controllers and different keyboards. How many different answer files do you need?
15. You want to automate the installation of various applications at the same time you perform an unattended installation of Windows NT. Which subfolder should you use to store source files that will be used to install applications that support scripted installation?
16. What file must you edit to instruct `Winnt.exe` to execute the commands in the `Cmdlines.txt` file so that applications will be installed during an unattended installation of Windows NT?
17. What are the three major functions of `Sysdiff.exe`?



concept link

For answers to the Instant Assessment questions see Appendix D.

Hands-on Lab Exercise

The following hands-on lab exercise provides an excellent opportunity for you to apply some of the server-based deployment concepts you've learned about in this chapter.

Lab 5.7 *Creating an answer file using Setup Manager*



Workstation
Server

The purpose of this lab is to familiarize you with the use of Setup Manager to create `Unattend.txt` files.

There are two parts to this lab:

Part 1: Creating an `Unattend.txt` file using Setup Manager

Part 2: Viewing the contents of the `Unattend.txt` file

Begin this lab by booting your computer to Windows NT Server.

Insert your Windows NT Server (or Windows NT Workstation) compact disc in your CD-ROM drive.

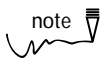
Follow the steps below carefully.

Part 1: Creating an `Unattend.txt` file using Setup Manager

1. Select Start > Programs > Windows NT Explorer.
2. In the All Folders list box (on the left side of your screen) in Windows NT Explorer, scroll down to My Computer, and then click the + sign next to your CD-ROM drive.
3. Click the + sign next to Support, and then click the + sign next to Deptools.
4. Click the I386 folder (not the + sign next to it).
5. In the Contents of "I386" box (on the right side of your screen), double-click `Setupmgr.exe`.
6. The Windows NT Setup Manager dialog box appears. Click General Setup.
7. The General Setup Options dialog box appears. Type in your user name (use **your name**). Press Tab. Type in the name of your organization (use any name . . . how about **MCSE Candidates Company?**). Press Tab. Type in your computer name (use **NTW2** for this lab). Press Tab. For the product ID number, type in **123-4567890**. (Don't type in the period at the end.) Click the General tab.
8. Notice the configuration options available in the General tab. Do not select any check boxes. Click the Computer Role tab.
9. In the Select the role of the computer drop-down list box, select "Workstation in domain". In the Enter the domain name text box, type **LAB**. Leave the "Enter the computer account" text box blank. Click the Install Directory tab.

10. Notice the configuration options available in the Install Directory tab. Do not change any of the options. Click the Display Settings tab.
11. Notice the configuration options available in the Display Settings tab. In the Settings section, change the Horizontal Resolution to 800, and change the Vertical Resolution to 600. Click the Time Zone tab.
12. In the drop-down list box in the Time Zone tab, select your time zone. Click the License Mode tab.
13. A warning message appears, stating that if you want to configure the License Mode, the computer role must be a server. Click OK.
14. The General Setup Options dialog box appears. Click OK.
15. The Windows NT Setup Manager dialog box reappears. Click Networking Setup.
16. The Networking Options dialog box appears. On the General tab, select the radio button next to "Automatically detect and install first adapter". Click the Protocols tab.
17. On the Protocols tab, click the Add command button.
18. The Adding Protocols dialog box appears. In the drop-down list box, select TCP/IP. Click OK.
19. The Networking Options dialog box reappears. Click the Parameters command button.
20. The TCP/IP Protocol Parameters dialog box appears. Click the check box next to Do Not Use DHCP. Type an IP Address of **192.168.59.11**. Type a Subnet of **255.255.255.0**. Type a Gateway of **192.168.59.1**. (Don't type a period at the end of any of these.) Click OK to continue.
21. The Protocols tab reappears. Click the Services tab.
22. The Services tab appears. Click the Add command button.
23. The Adding Services dialog box appears. In the drop-down list box, select Remote Access Service (RAS). Click OK.
24. The Services tab reappears. Click the Parameters command button.
25. The Remote Access Service Parameters dialog box appears. Click the Ports tab.
26. On the Ports tab, click the Add command button. (Notice that PortSection1 has moved from the top list box to the bottom list box.)
27. Click the Parameters command button.
28. The Port Parameters dialog box appears.
29. Notice the configuration options available. Do not change any of the options. Click OK.

30. The Ports tab reappears. Click OK.
31. The Services tab reappears. Click the Modem tab.
32. In the COM drop-down list box on the Modem tab, select 1. In the Modem Description list box, type **STANDARD 28800 bps Modem**. (Don't type the period at the end of any of these.) In the Manufacturer text box, type **(Standard Modem Types)**. In the Provider text box, type **Unimodem Service Provider**. (Click the Add command button. Click OK.
33. The Windows NT Setup Manager dialog box reappears. Click Advanced Setup.
34. The Advanced Options dialog box appears. On the General tab, check the check boxes next to Skip Welcome wizard page and Skip Administrator Password wizard page.
35. Click the File System tab.
36. Notice the configuration options available on the File System tab. Click the Mass Storage tab.
37. Notice the configuration options available on the Mass Storage tab.



You only need to specify mass storage devices whose drivers do not ship with Windows NT. All other mass storage devices are automatically detected by Windows NT. If you are using a SCSI adapter whose drivers do not ship with NT, click on the Add command button and follow the onscreen directions to add and configure the driver.

38. Click the Display tab.
39. Notice the configuration options available on the Display tab. As with mass storage devices, you only need to modify this tab if your display adapter's drivers do not ship with Windows NT. (See the note above.) Click OK.
40. The Windows NT Setup Manager dialog box reappears. Select File ➤ Save As.
41. In the File Name text box, type **C:\Unattend.txt**. (Don't type the period at the end.) Click the Save command button.
42. The Windows NT Setup Manager dialog box reappears. Click Exit.
43. The Windows NT Explorer dialog box reappears. The Unattend.txt file is now created. Continue to Part 2, where you'll view the contents of this file.

Part 2: Viewing the contents of the Unattend.txt file

1. In the Windows NT Explorer dialog box, in the All Folders box (on the left side of the screen), click drive C: (not the + sign next to drive C:). In the Contents Of '(C:)' box (on the right side of the screen), scroll down to the bottom. Double-click Unattend.txt.

2. The `Unattend.txt` file is displayed in Notepad. Examine the contents of this file. (You can print the contents of this file if you desire.) Notice the formatting of the various sections.
3. When you are finished, select File ➤ Exit.
4. Exit Windows NT Explorer.