
Windows 2000 Automated Installations

Deploying Windows 2000 can be a lengthy process, especially when it involves a number of machines. By automating this task the total cost of ownership can be lowered significantly.

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The deployment of a new operating system can be a slow and time-consuming process. Despite its bells and whistles, migrating to Windows 2000 is no different. From beginning to end the operation must be handled efficiently and with as little downtime as possible.

Microsoft has incorporated several technologies into the Windows 2000 OS that makes automating the setup process easier than before. Of the options, distributed scripts are the easiest to set up. Basically, this means creating an answer file in advance, thereby eliminating the need for administrators to be at the console of the machine during deployment.

Significant amounts of time can be saved using answer files. With answer files, Windows 2000 Server and more commonly Windows 2000 Professional can be installed using a network share or a bootable CD-ROM. Basically, answer files give the Windows 2000 setup program most if not all of the responses it needs during the setup process.

Right Answers

Thankfully the days of building answer files from scratch are long gone. Microsoft first simplified the process by including the Setup Manager utility in the Microsoft Windows NT Server 4.0 Resource Kit. Both Windows 2000 Server and Windows 2000 Professional CD-ROMs include an improved version of this utility. In addition to building answer files, Setup Manager can automate the creation of a distribution share point. To take advantage of this option Setup Manager must be launched at the server that will hold the distribution files. Be warned, though, that a little over 300 MB of available space is required to hold more than 7,500 files.

Although the information contained within an answer file will vary to suit individual circumstances, a typical script will include acceptance of the licensing agreement, the computer name, and the type of network adapter used. By far the easiest way to create such an answer file is to use the Setup Manager Wizard. Even so, there is nothing to stop administrators from creating answer files manually. A basic text editor such as Notepad will suffice, or alternatively it is possible to edit an existing answer file. Examples of three ready-made answer files are offered in the unattend.txt file, which can be extracted from the deploy.cab file found in the Support\Tools folder of the Windows 2000 CD.

Once administrators become accustomed to answer files, they can generate scripts that are far more comprehensive than those created using the Setup Manager Wizard. To that end, the same unattend.txt file includes a full listing of answer file parameters. It must be emphasized, however, that administrators creating their own answer files - especially those of a complex nature - are likely to find a certain amount of trial and error is involved before such files are deemed perfect.

Wizard

The latest version of Setup Manager is stored in the same cabinet file, deploy.cab, described earlier. To access the Setup Manager Wizard, extract the deploy.cab file to a folder on the hard drive, and then launch setupmgr.exe using the RUN command. After the initial welcome screen, a configuration screen first prompts administrators to specify what kind of answer files they would like to create.

Administrators can choose to create an answer file from scratch, or create one that pulls its base settings from the machine running the Setup Manager utility. In addition, users can elect to have Setup Manager modify an existing answer file by specifying its location. If, for example, administrators wish to create an answer file for one or more computers over the network, then creating an answer file from scratch is the best choice (see Figure 1).

Cloning Around

Apart from creating a script for unattended installations, the next screen provides a further two options - namely, the opportunity to build either Sysprep or Remote Installation Services (RIS) answer files. Thus, administrators are provided with three of the most popular ways to initiate automated deployment: unattended distributed scripts, disk cloning, and the ability to install Windows 2000 remotely.

Disk cloning is the fastest, but it is also the most complex to deploy since it involves dealing with a variety of hardware combinations. Using Sysprep, for example, administrators would first install Windows 2000 to a master computer along with any applications to be installed on the target computers. They would then use Sysprep to prepare the hard disk on the master computer for duplication to other computers before running a third-party disk imaging process to finish the job.

As an aside, it is worth pointing out that Microsoft has never been overly keen on the cloning of NT machines, mainly because of the security implications of duplicating the SID. Although Microsoft still does not provide a true cloning utility in Windows 2000, it has provided a SID-changing utility called Sidewalker, which is one of several tools included in the Windows 2000 Resource Kit. Sidewalker can be used in conjunction with Sysprep to clear out the registry information associated with the computer ID. Basically, this places the system in the same state a machine would be in just after the text-based portion of Setup.

Overall, Sysprep is best regarded as a tool for hardware vendors requiring a quick way to wipe individual computer settings prior to using one hard drive to clone a multitude of others. Sysprep is not really suitable for corporate deployment. However, a number of third-party products are available for this purpose, one of which is Norton Ghost from Symantec (www.symantec.com/ghost).

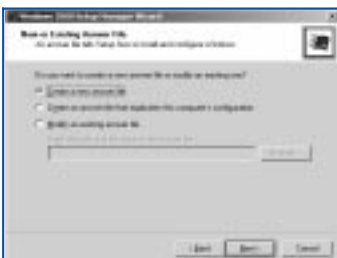


Figure 1 - Creating answer files with the Setup Manager Wizard.

Answer Files

The following is an example of an answer file created by Setup Manager for the purpose of performing an unattended installation of Windows 2000 Professional. Note that the utility can automatically set up a distribution folder to hold the files necessary for a successful deployment. In this example, the distribution folder resides on drive E in a folder named \win2000dist.

```

;SetupMgrTag                                [Display]
[Data]                                       Xresolution=800
    AutoPartition=1                          Yresolution=600
    MsDosInitiated="No"                      Vrefresh=70
    UnattendedInstall="Yes"

[Unattended]                                 [TapiLocation]
    UnattendMode=FullUnattended              CountryCode=44
    OemSkipEula=Yes                           Dialing=Tone
    OemPreinstall=Yes                          AreaCode=0191
    TargetPath=\WINNT

[GuiUnattended]                              [RegionalSettings]
    AdminPassword=PASSWORD                   LanguageGroup=1
    AutoLogon=Yes                              Language=00000809
    AutoLogonCount=1
    OEMSkipRegional=1
    TimeZone=85
    OemSkipWelcome=1

[SetupMgr]
    DistFolder=E:\win2000dist
    DistShare=win2000dist

[Identification]
    JoinWorkgroup=PPC

[UserData]
    FullName="Dave Cook"
    OrgName="BuzyBee"
    ComputerName=W2Knew
    ProductID = my_product_ID

[Networking]
    InstallDefaultComponents=Yes
  
```

Remote Installs

The Remote Installation Service (RIS) is, as its name suggests, capable of installing (but not upgrading) Windows 2000 on remote boot-enabled computers. Basically, RIS consists of a server and a client element. The server part is the Remote Installation Service itself, which manages the boot image responsible for installing Windows 2000 Professional to the client. Client machines, meanwhile, use remote booting to connect to the RIS server and download the image.

Overall, RIS is a fast and convenient way to deploy large numbers of Windows 2000 Professional desktops. Be aware, however, that in order to use RIS, the following services are required:

- Active Directory.
- DDNS.
- DHCP.
- A domain controller or a server that is a member of a Windows 2000 domain.
- A client fitted with a network adapter supporting either a remote NDIS-style PROM or a PROM emulator.

Note that, because few network adapters nowadays are fitted with a remote boot PROM, Windows 2000 provides its own PROM emulator software. This must be loaded from a boot floppy when the POST begins the final boot process. Administrators can build this floppy disk using the Remote Boot Floppy Generator utility, found on the Windows 2000 Server CD. Its executable name is rbfgen.exe and, with RIS installed, it can be located in the \winnt\system32\reminst folder.

Editing Files

Having selected one of the three answer file types, the Wizard will then guide administrators painlessly through the rest of the process. As it does so, administrators are asked the kind of questions they would normally face during a manual setup (see Figure 2). Upon receiving this information, the Wizard automatically writes the responses to the answer file and in the appropriate syntax. Additional settings not normally handled by the answer file can also be specified (Figure 3).

One detail that answer files do not cover is the product ID. However, there is nothing to stop administrators from adding this information to the answer file manually, thereby preventing the automated process from pausing during installation. To manually add the product ID value with a valid licence key, administrators need to enter the relevant value in the UserData section of the answer file, as our Answer File box shows.

On completion of the Wizard, Setup Manager will have created two files: an answer file called unattend.txt and a batch file that automatically launches the setup program along with the answer file. The batch file sets both the answer file and setup file environmental variables to their correct locations, and launches the setup program with the answer file as a command-line argument.

Deployment

Windows 2000 can now be installed over the network using an answer file. To achieve this, administrators would run WINNT.EXE for a clean install or WINNT32.EXE for an upgrade, using the /unattend command switch to specify that this is for an unattended installation. Typically, administrators would click Start, Run, and in the Run dialog box type:

```
winnt32 /s:path\distrib_folder_name /unattend:path\distrib_folder_name\ans_file_name
```

Note that the /s command-line option indicates the path to the Windows 2000 source files. Multiple /s switches would be specified to install from multiple sources simultaneously.

The Syspart parameter is another way in which administrators can automate the Windows 2000 installation. Syspart works through disk imaging, in a similar manner to Sysprep. Unlike Sysprep, however, Syspart is designed for use on machines that have dissimilar hardware. Frequently, this is when a similar

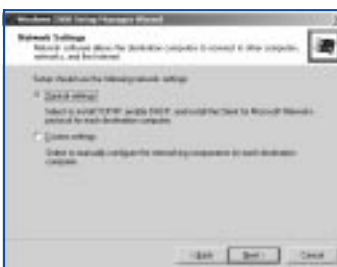


Figure 2 - Using answer files to configure network settings.

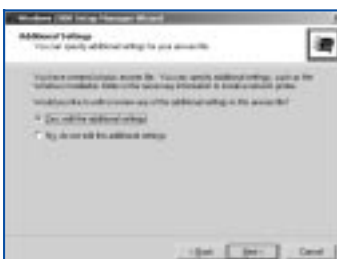


Figure 3 - Choosing to edit answer files with the Wizard.

installation is required, and operating configurations on hardware in which the Hardware Abstraction Layer (HAL) or mass storage controllers differ.

Syspart can be used when the environment includes multiple types of hardware-dependant systems. For example, administrators would create a master for each type using Syspart, install Windows 2000 on one computer of each type, and then use the Sysprep utility to help create the images to be used on the remaining computers of each type. To install Windows 2000 using Syspart, start the reference computer and connect to the installation distribution folder. Run Setup, click Start, click Run, and type the following:

```
winnt32 /unattend:unattend.txt /s:install_source
/syspart:second_drive /tempdrive:second_drive/noreboot
```

There are a few points here worth noting. First, be aware that the /tempdrive parameter must be used for a successful installation, and that the /s switch is used to specify the source location of the Windows 2000 files. In addition, note that the /syspart and /tempdrive parameters must point to the same partition on the secondary hard disk. Also remember that the unattend.txt definition is the name of the answer file used for an unattended setup. The second_drive path is an optional second drive on which administrators may preinstall Windows 2000 along with any applications. Using the /noreboot switch instructs Setup not to restart the computer after the file copy phase of WINNT32 is complete, thereby allowing other commands to be executed.

CD Options

One of the neatest ways to automate the installation of Windows 2000 is via CD-ROM. For example, it is possible to burn a CD-ROM that contains the Windows 2000 Professional source files, along with the accompanying answer file. This CD could then be used to install the operating system to a line of remote computers, perhaps hindered by slow links and with no local IT department to speak of. In order to accomplish this, however, the following conditions should be met:

- The bootable CD method can only be used for clean installations.
- The computer must be able to boot from a CD-ROM, whilst adhering to the El-Torito specification.
- The answer file must contain a valid Data entry, such as the one shown in the Data section of our answer file example in the box.
- The unattended answer file must be renamed as winnt.sif and copied to a floppy disk so that it can be accessed by Setup.

To prepare a computer for an unattended installation of Windows 2000 from a CD-ROM, first save the unattended answer file as winnt.sif onto a floppy disk. Next, insert the Windows 2000 CD-ROM into the CD-ROM drive and the floppy disk into the disk drive. Restart the computer and change the boot order in CMOS, so that the CD-ROM is at the top of the list of bootable devices. Reboot again. When Setup begins, the winnt.sif file located on the floppy disk will be used for the unattended installation. After the computer reads from the floppy disk drive, remove the floppy disk and Setup will run from the CD as specified by the winnt.sif file.

Further Information

Microsoft hardware compatibility list
www.microsoft.com/hcl

Development and testing site
www.microsoft.com/hwdev

Latest application compatibility information
www.microsoft.com/windows2000/compatible

Microsoft's planning and deployment guide
www.microsoft.com/windows2000/library/planning

Automated deployment overview.
www.microsoft.com/windows2000/library/planning/client/deployops.asp

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