

Server Upgrade: Win NT To Win 2000

Choosing the upgrade path, rather than installing Windows 2000 from scratch, is the easiest option when a server is already set up and running on a network. However, there are certain precautions you should take before proceeding.

By Dave Cook

First, the good news: the vast majority of upgrades from Windows NT Server to Windows 2000 Server proceed without a hitch. Although installation is a lengthier process than with Windows NT, a much-improved setup streamlines the upgrade significantly.

All the same, even the most experienced NT administrators would do well to familiarise themselves with the installation routine before attempting the real thing. There are important decisions to be made, both before and during the upgrade, that will directly affect the performance and reliability of the machine.

While Windows 2000 is more power-hungry than Windows NT, it is also more adaptable. Minimum requirements include a 133 MHz Pentium-compatible processor, 256 MB of RAM (128 MB min, 4 GB max), plus at least 1 GB of available hard disk space. Up to four CPUs are supported on one server.

Restructuring

Administrators can choose whether to upgrade member servers before upgrading domains, or vice versa. If member servers are upgraded first then a variety of features become available, though none that require the new directory service, Active Directory. Note that, when upgrading domain controllers in an existing NT domain, the primary domain controller (PDC) must be upgraded first.

Certain decisions need to be addressed concerning the structure of the domain about to be upgraded. Basi-

cally, there are two options to consider: whether to retain the existing domain structure, or whether to consolidate the domain structure so that the network architecture can be tailored to suit your company's requirements. Bear in mind, however, that there is no reason to restructure an organisation that contains only one domain.

Retaining the existing domain structure is by far the easiest option, because it avoids having to upgrade all of the operating systems included in the domain in one fell swoop. Besides, the typical Windows 2000 Server will be perfectly happy in a mixed networking environment that supports, for instance, Windows 2000 Professional, Windows NT 4.0 and Windows 9x.

In the majority of situations, implementing the restructuring process is best performed later, after the upgrade, and once any minor problems have been eliminated. The benefits of restructuring under Windows 2000 include the capability to move domain controllers between domains without reinstalling the OS. In most cases, the only work required in the resource domains beforehand will involve moving applications and services from domain controllers to member servers.

Active Directory

Although Active Directory can be implemented at any time after the upgrade, careful planning of its design is vital from a very early stage. Under certain conditions, therefore, it may be better to restructure domains beforehand.

To fully take advantage of Active Directory, Microsoft advises fewer and larger domains. So a good reason to implement the restructuring process before the upgrade would be, for example, when the design of Active Directory calls for only two domains and yet your company presently has four. Eliminating the two extra domains would simplify the upgrade and deployment of Active Directory.

Be warned, though, that restructuring domains beforehand is no easy task. Points to look out for include the following:

- The recommended size limit of the Security Account Manager (SAM) is only 40 MB. But companies with a large assembly of users, groups and computers will already have a large SAM; in which case, do not combine domains if their united SAM databases will be greater than 40 MB.
- Even if the size of the combined SAM database is less than 40 MB, it follows that SAM replication traffic will inevitably increase. Always verify beforehand that the network can actually handle this upsurge.
- Certain domains may have been specifically created to delegate administrative tasks. It stands to reason, therefore, that eliminating these domains will disrupt the system.

For further information regarding the restructuring of domains, administrators will find Microsoft's Windows 2000 Server deployment guide extremely useful. The guide is available

at www.microsoft.com/windows-2000/library/resources/reskit/dpg/default.asp.

Hardware Support

When it comes to existing hardware, try to ensure that the computer and its peripherals are registered on Microsoft's Hardware Compatibility List (HCL). This list is maintained and updated regularly, and can be accessed at www.microsoft.com/hcl.

Network adapters are a common cause of difficulties during setup. To avoid this particular problem, ensure that the machine's adapter is HCL-certified. Although Windows 2000 should work with the majority of today's devices, including many items not listed on the HCL, Microsoft will be in a much better position to offer your organisation a high level of support if components are certified.

Precautions

While the vast majority of Windows 2000 Server upgrades are quite painless, several troublesome areas are known to exist. A few precautions taken early on will almost certainly avoid more than a few glitches later.

First and foremost, take a backup before the upgrade and have it verified. It is also a good idea to run a registry clean-up tool to get rid of any unused entries and to compact the hives. Substantial changes are made to the registry during the upgrade process; hence, there is no easy way to recover from a registry problem later by simply overwriting a hive file.

Remember to disconnect the uninterruptible power supply (UPS) connected to the server, and check that the motherboard's BIOS and all peripherals are running the most up-to-date firmware version. Also, uncompress any compressed disk volumes unless they were compressed using the NTFS compression utility.

Disk mirroring, if present, should be disabled and re-mirrored after the upgrade. This limitation does not apply to hardware RAID. Disk caching should also be disabled. Only enable hardware disk caching if the system is specifically designed to support caching

under Windows 2000.

As far as EIDE drives are concerned, make sure that I/O and disk access is set to Standard in CMOS, rather than 32-bit or Enhanced. This is because Windows 2000 does not support the direct INT13 calls used by enhanced interfaces.

If the server uses a mass storage controller that requires a driver supplied by the manufacturer, have the appropriate driver to hand during setup. Although numerous drivers are provided with Windows 2000, it is always better to be safe than sorry. Other than Microsoft's HCL-certified Web site, a full list of supplied drivers is available from the file HCL.TXT, which can be found in the Support folder on the Windows 2000 CD-ROM.

Meanwhile, to run an operating system compatibility report and then have it save the report to the WINNT32.LOG in the target machine's Windows subdirectory. Insert the Windows 2000 CD in the CD-ROM drive and click Start, and then Run. In the Run dialog box, type `path\WINNT32.EXE /checkupgradeonly`.

After running the compatibility check, head for the file's location and open it as a text file to view its contents.

File Systems

Whichever file system is installed or converted during setup - Windows 2000 supports NTFS, FAT and FAT32, with NTFS being the preferred choice - it is important that the Windows 2000 disk partition is allowed plenty of room. Windows NT fits comfortably inside a 400 MB partition, but Windows 2000 requires a lot more space than that.

At least 850 MB of free space is required in the existing NT partition, while another 250 MB is needed to store temporary files when installing across a network or directly from CD. In order to avoid fragmenting the Master File Table (MFT) and thereby reducing performance, allow for a 1 GB partition, but with 2 GB being the preferred figure.

Be wary of unnecessary resource allocations during the upgrade. Plug and Play is often disabled on NT Servers, so remember to enable it just prior

to upgrading. Any non-Plug and Play (legacy) devices on the server should have their IRQs reserved in the CMOS beforehand. This will safely negate any potential conflicts when the Plug and Play enumerator assigns resources.

Consider, at the same time, disabling ROM Shadowing and Video Shadowing, since Windows 2000 requires neither. Also note that certain new features in NTFS may cause anti-virus applications that are still running to become unstable. In order to avoid this occurrence, disable and de-install virus scanning just before the upgrade. It can be re-installed immediately afterwards.

To help safeguard existing network integrity, consider removing a backup domain controller (BDC) temporarily from a network. After verifying that it has a current copy of the user accounts database, back it up and disconnect its network cable. When the PDC has been upgraded to Windows 2000, the disconnected system will be available for promotion to a Windows NT PDC should it be needed.

Note that, once all PDCs and BDCs are upgraded to Windows 2000, there are no distinctions between the two. They all become domain controllers.

Performing An Upgrade

Thus, armed with a suitable migration strategy, and having undertaken all or at least most of the precautions mentioned previously, the upgrade can finally go ahead. Be aware that the exact steps of the upgrade will vary somewhat. This is due to individual circumstances, and the unique configuration of the existing system.

Installation can be initiated from four setup boot disks, or from the Windows 2000 CD. If the setup disks are not readily to hand, a new set can be built using the MAKEBT32 utility located on the Windows 2000 CD.

Basically, there are three ways to install Windows 2000 Server:

- As a fresh install: Windows 2000 Server is installed as the only operating system on a formatted or empty hard drive.
- As a dual boot: Windows 2000 Serv-

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er is installed alongside another operating system - typically Windows 9x or Windows NT - in a dual-boot scenario.

- As an upgrade: Windows NT Server 3.51 (excluding installations with Citrix software), Windows NT Server 4.0 or Windows NT Terminal Server 4.0 is upgraded to Windows 2000 Server. Choosing to upgrade retains existing settings, groups, users, rights and permissions, and most applications are left intact.

Using Administrator privileges on the NT Server, insert the Windows 2000 Server CD in the CD-ROM drive and allow AUTORUN to begin the Setup routine. If the installation program fails to come into view, open Windows Explorer and expand the distribution CD icon. Double-click the I386 folder, and then double-click the file, WINNT32.EXE, to initiate Setup.

The following prompt will appear: "Would you like to upgrade to Windows 2000?" Click Yes and then select the Upgrade to Windows 2000 option to replace the current installation of NT Server with Windows 2000 Server.

After accepting the licensing agreement, click Next, and enter the 25-character product key provided by Microsoft. Following a short scan of the machine's registry, the Report Sys-

tem Compatibility window opens and displays any components or devices that are not Windows 2000 compatible.

Third-Party Drivers

Assuming any such problems are not likely to hamper the computer's functionality in any way, click Next, and setup will reboot and begin the process of installing the necessary device drivers. Note that, during the early part of setup, a line at the bottom of the screen will prompt the administrator to press F6 if any third-party SCSI or RAID drivers are required.

If the mass storage controller is not supported, an error message will indicate a problem with an inaccessible boot device. If this occurs, the administrator should insert the manufacturer's driver disk and follow the onscreen instructions. Setup will then copy the installation files to the local drive. After a short delay, setup will request a user name and the name of your organisation, although providing the latter is not essential.

Click Next and setup will ask for a licensing mode. Selecting "per server" will set up the server to work with a specific number of concurrent trusted connections, while a "per seat" licensing mode requires that each computer accessing Windows 2000 through a trusted connection has its own licence.

Setup will then ask for a computer name and an administrator password. On completion, click Next to choose from a list of optional components to install, or click Details for further information on each component. The list includes several useful features, including Certificate Services for public key security applications, and Remote Installation Services for remotely installing Windows 2000 on remote boot-enabled computers. Remember that these components can always be added later, of course.

Date and time zone adjustments come next, followed by network settings. The first of two options is Typical, which includes TCP/IP, Microsoft Networks client, and File and Print Sharing for Microsoft Networks. Selecting this option should be fine if the machine is in a Windows networking environment. The second option is Custom, which allows the administrator to manually configure networking components.

Click Next so that the computer can be registered with a specific workgroup or a Windows 2000/NT domain. If the computer is not part of a domain, select No to register with a workgroup. To register with a domain, click Yes. Finally, type the name of the workgroup or the domain in the field at the bottom of the screen and click Next again.



Figure 1 - Select the Upgrade To Windows 2000 option to replace the current installation of NT Server with Windows 2000 Server.



Figure 2 - This helpful wizard will guide the administrator through any options that Setup did not install during the upgrade.

Wizard

When setup is complete - a process that can take, from start to finish, anything from 90 minutes to several hours - Windows 2000 Server will boot, request the user's name and password, and display the Windows 2000 Configure Your Server dialog box. This helpful wizard will guide the administrator through any options that setup did not install during the upgrade.

Although the wizard presents the option to change the domain name during this stage, always use the classic NT domain name for the Windows 2000 domain. This avoids any unnecessary complications; whatever name is chosen, the old name will continue to appear in the registry and on domain lists at downlevel clients.

On completion of the wizard, the server will become a functional member of the Active Directory domain tree or forest, depending on the existing network structure. As part of the Windows 2000 domain and site structure, any other domain controllers will have been notified by setup of its inclusion.

End Game

Following the upgrade, a few simple checks can be performed to ensure that users still have access to shared resources on the server. For example, log on at a downlevel workstation in an account domain, open Network Neighborhood, and ensure that the newly upgraded server is visible. Double-click to see the shared resources. Then follow the same procedure in all downlevel resource domains to verify that trusts are still intact.

Finally, be aware that, when a domain controller is first upgraded to Windows 2000, it will be in mixed mode by default. This ensures maximum backward operating system compatibility. The alternative is native mode, which allows your users to enjoy the full benefits of Windows 2000, including group nesting and universal groups.

Because of certain compatibility requirements, take care not to switch the domain from mixed mode to native mode until all of the domain controllers in a domain are running Windows 2000. Be warned, however, that converting to native mode is a one-time

event that cannot be reversed.

To switch from mixed mode to native mode, click Start and point to Programs, Administrative Tools, and click Active Directory Domains and Trusts. In the tree pane, right-click the domain to be switched. Click Properties to open the Properties dialog box for the selected domain. Note the warning in the Domain Mode box and click Change Mode, click Yes, and then click OK to complete the switch.

Further Information

www.microsoft.com/hcl
Microsoft hardware compatibility list.

www.microsoft.com/hwdev
Development and testing site.

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

www.microsoft.com/windows2000/library/resources/reskit/dpg/default.asp
Server deployment guide.

www.complete.com/Active%20Directory.htm
Active Directory "quick notes".

www.osr.com
Driver development site.



Figure 3 - With Active Directory installed, user accounts and group settings become more manageable.

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