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# How To Deploy Windows XP Professional

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*From careful planning to the use of remote installations, unattended scripts and disk cloning, there are numerous ways in which organisations can efficiently deploy Windows XP Professional.*

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**O**ur hard disks have barely stopped spinning from a Windows 2000 rollout, and yet once again the upgrade season is upon us. According to Microsoft, Windows XP brings a new level of reliability to small and midsize organisations.

## TCP/IP

As with Windows 2000, Windows XP Professional employs TCP/IP as its standard network protocol. A Home Network wizard (Figure 1) should be of particular benefit to small companies that cannot match the levels of support offered by larger organisations. The wizard is useful for creating peer-to-peer networks in a small office environment. It is capable of recognising computers running disparate versions of Windows before placing them in a workgroup. The wizard also detects network-capable printers and makes them available to the workgroup.

For a Windows XP Professional-based computer to connect to NetWare or Macintosh servers, system administrators must use a protocol that is compatible with the server. NWLink is the Microsoft implementation of the Novell IPX/SPX (Internet Network Packet Exchange/Sequenced Packet Exchange) protocol, which allows administrators to connect to NetWare file and print servers.

## Planning

Unless organisations are currently running Windows 2000, migrating to Windows XP Professional will require careful planning. The first step in the process is to define project goals and objectives, ensuring that they are consistent with the long-term needs of the organisation and its users. Use a project plan to identify the most important phases of the deployment process. Try to provide a clear and functional outline, clarifying the scope of the project, setting out the time frame involved and exactly which people or groups will be affected. When determining a project scope, take the following aspects into consideration:

- Determine and document the number of computers, departments, networks, and locations that will be involved in the deployment.
- Decide whether it will be a desktop operating system upgrade only. What implication will the upgrade have on application servers, and will Active Directory be involved?
- Evaluate application requirements, making an inventory of all existing hardware and software.
- Assess present and future hardware and software standards, as well as support issues.
- Establish the network services in use, naming conventions, name/address resolution methods, security policy etc. Determine the impact of change if complex networks are involved.
- Check levels of interoperability, eg, the presence of NetWare, Unix or Linux-based computers.
- Make a determined effort to standardise the desktop and administration environment before deployment. The simpler the operating system environment, the less likely that problems will occur.

## Tools

There are a number of tools available that are designed to help administrators

conduct an automated inventory of the working environment. Small organisations should find NetCensus or QuickCensus by Tally Systems ([www.tallysys.com](http://www.tallysys.com)) useful for inventorying client computers. For example, QuickCensus takes a complete hardware inventory and also recognises the majority of software programs in use today. It is excellent at reporting mainstream applications, though not so good at listing software versions or sub-versions.

Mid-size to larger organisations should seriously consider using Microsoft's System Management Server (SMS). SMS provides a complete hardware and software inventory for all of its clients and includes information appertaining to the services and devices that Windows NT and Windows 2000 clients are running. For further information about deployment procedures using SMS, see the white paper "Using Systems Management Server To Deploy Windows 2000" at [www.microsoft.com/smsgmt/deployment/deploywin2k.asp](http://www.microsoft.com/smsgmt/deployment/deploywin2k.asp). The information reported in the white paper also applies to deploying Windows XP.

With the inventory complete, and having identified any problem areas, the next step is to address them before the new operating system is put into place. That means resolving all hardware and software compatibilities, and ensuring that all computers on which the operating system is to be deployed meet the minimum standards necessary to achieve a successful upgrade. To view the most up-to-date list of supported hardware devices that have passed Microsoft's Hardware Compatibility Tests (HCT) for Windows XP, visit the Microsoft Hardware Compatibility List Web site at [www.microsoft.com/hcl](http://www.microsoft.com/hcl).

Microsoft also has a free tool, from [www.microsoft.com/windowsxp](http://www.microsoft.com/windowsxp), which analyses PCs and checks for WinXP hardware and software compatibility. This is a serious tool, some 35 MB in size, with a database of over 4000 applications and 1500 hardware devices.

### Problem Areas

Windows XP Professional contains many new technologies, some of which are not compatible with older Windows operating systems. Note, for example, that when upgrading Windows 9x desktops, certain system tools such as DriveSpace and ScanDisk, cannot be upgraded to Windows XP Professional. Particular attention should also be paid to critical device drivers. Although these drivers are really software components, they are important because of their interaction with a machine's hardware. Typically, 16-bit device drivers for Windows 9x and Windows Me are based on the virtual device driver (VxD) model. However, because the VxD model is not supported in Windows XP Professional, successful migration of these drivers is not possible.

Many updated drivers are included on the Windows XP Professional CD. In cases where existing drivers are not compatible with Windows XP Professional, or they cannot be found, Setup will halt the upgrade until correct drivers are obtained from the device manufacturer. Drivers for most hardware items such as SCSI adapters, network adapters, and video cards are usually updated on a quarterly basis so check vendor Web sites frequently to see if the latest drivers offer improvements over the existing ones. Likewise, system administrators with experience of a Windows 2000 deployment - Windows 2000 Setup and XP Professional's Setup are very similar - will be aware that a desktop encumbered with an out of date BIOS can be particularly troublesome. It is worth checking, therefore, that all clients boast the latest available BIOS version that it is compatible with Windows XP Professional.

Depending on the manufacturer, there are several ways in which to flash a computer's BIOS. Generally, BIOS updates and flash software (Figure 2) can be obtained from the computer or motherboard manufacturer's Web site. Check also that the BIOS can support Advanced Configuration and Power Interface (ACPI) functionality. If it does not, and the BIOS cannot be updated to support this feature, then consider replacing the motherboard.

### Application Compatibility

In general, organisations that use Windows 2000 should have few, if any, application problems when migrating to Windows XP. Even Windows NT 4.0 workstations share a number of common attributes with Windows XP Professional. Hence most

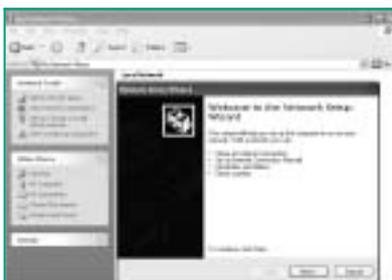


Figure 1 - The Home Network wizard is not just for the home.

NT4 applications should run without modification on Windows XP Professional. All the same, system administrators of organisations that currently use Windows NT 4.0 will need to set up a test environment to ascertain whether these applications work equally well on the new operating system. Be warned, though, that due to changes in the NTFS file system, applications that rely on file system filters such as antivirus programs and disk quota software will almost certainly need to be upgraded, as will any third-party networking software that makes use of alternative TCP/IP or IPX/SPX protocol stacks.

Software applications written specifically for Windows 9x are another area in which you need to be wary. While the majority of Windows 9x applications should co-exist quite happily with Windows XP Professional, it is possible that some older programs might not run properly without modification. There are a number of ways to address problems with applications that do not run properly on Windows XP Professional:

- Contact the vendor. Typically, the vendor's Web page will list known issues concerning the application and Windows XP Professional. Patches may be available to fix any problems.
- Install Windows XP Professional in a test lab, and then test that the applications function as they should. A large percentage of problems come to light when tested in this way.
- Reinstall the applications after deployment to discover whether they are compatible with Windows XP Professional.
- Use migration dynamic-link libraries (DLLs) for each application that is not migrated during the upgrade.
- Use the Program Compatibility wizard (or set compatibility properties manually).

This latter option, the Program Compatibility wizard (Figure 3), is a useful tool once Windows XP Professional is up and running, since it enables administrators to test problem programs in different operating environments and with various settings. If, for example, the program was originally designed to run on Windows 95, Windows XP Professional allows administrators to set the compatibility mode option to Windows 95. Should this option succeed, the program will always start in that mode. Various other settings can be applied. For example, the display can be switched to 256 colours and the screen resolution to 640 x 480 pixels.

If, despite your best efforts, an old program still refuses to work after a Windows XP Professional upgrade, it might be a good idea to admit defeat gracefully and consider retirement - the application, that is, not the administrator. Its replacement may require planning and management approval, but the new application will almost certainly provide more features and greater capability over the old one.

In many cases, Microsoft, the Independent Software Vendors (ISV), or the Independent Hardware Vendors (IHV) will have already tested a product and rated its compatibility. Sometimes, the product's compatibility status will have been determined through practical use. Indeed, Microsoft encourages ISV and IHV representatives to submit information about how well their product has worked with Windows XP. For the latest information on product compatibility, visit [go.microsoft.com/fwlink/?LinkID=453](http://go.microsoft.com/fwlink/?LinkID=453). From here, administrators can search or browse by manufacturer or product to see which hardware and software is compatible (or incompatible) with Windows XP, and whether the product requires an update.

Of further value, the Windows XP Professional Setup includes a Check Upgrade Only mode (Figure 4), which can be used to test the upgrade process before actual deployment. Check Upgrade Only mode works much as it does in Windows 2000. In other words, having inspected the desktop in question, the Check Upgrade Only mode will display a report highlighting any potential problems that might be encountered during the actual upgrade. This could be hardware compatibility issues, or software that might not migrate successfully during the upgrade. To run Setup in Check Upgrade Only mode, run Winnt32.exe from the i386 folder with the command line switch -checkupgradeonly.

## Deployment Options

There are a number of ways in which Windows XP Professional can be installed on client computers. Which installation method is best depends first and foremost on

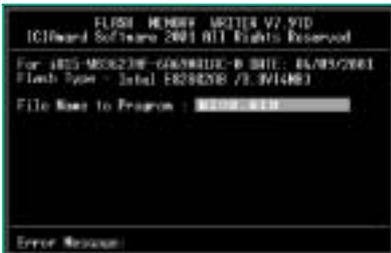


Figure 2 - Using Award's Flash Memory Writer to upgrade the BIOS.



Figure 3 - Solving application difficulties with the Program Compatibility wizard.

two factors: how many computers are involved in the migration; and whether you prefer to upgrade from existing operating systems or perform clean installations on freshly formatted or empty hard drives. Other deciding factors will vary from the amount of customisation required on client machines before installation begins, to the technical ability of the support staff or users that will be involved in the deployment. Installation options include the following:

- **Typical Upgrade** - Windows 9x, Me, or Windows NT Workstation 3.51 or 4.0 is upgraded manually to Windows XP Professional.
- **Typical Clean Install** - Windows XP Professional is installed from scratch on a freshly formatted or empty hard drive.
- **Unattended Installation** - where system administrators make use of scripts to perform an automated upgrade to Windows XP Professional on numerous computers.
- **Disk Cloning** - with the System Preparation tool (Sysprep.exe), system administrators take a snapshot of a Windows XP Professional-configured workstation before using a third-party tool to transfer or clone that image to multiple workstations.
- **Boot Server** - With Active Directory enabled on the boot server, Remote Installation Services is used to perform a clean installation on supported computers throughout the network.

### Conventional

The manual or conventional upgrade is generally the best option if only a small number of clients are involved in the migration to Windows XP Professional. Upgrading from the Windows XP Professional CD is quick, and simplifies deployment of the operating system on computers that do not have high-speed network connectivity. Installing the operating system manually from scratch is also a favoured option under these circumstances.

Later, with Windows XP running on the new machine, a Files And Settings Transfer wizard can help users transfer their important files and favourite settings from their old computer to the new one. This might include, for example, the contents of the My Documents folder, settings for Internet Explorer and Outlook Express, as well as desktop and display settings, dial-up settings, and so forth.

### Unattended

In large organisations that support hundreds or even thousands of computers, manually installing Windows XP Professional onto each and every computer is, of course, prohibitively expensive and extremely time-consuming. In this type of environment it is necessary to automate the installation process; even though alternative software and hardware configurations, plus a diverse range of user needs make it necessary to customise installations. One way to speed up deployment is to make use of unattended scripts.

The unattended setup script is most commonly used to perform a network upgrade or installation of Windows XP Professional. During an automated installation, Setup can be made to run with minimal or no user interaction. This is achieved by automating an installation of Windows XP Professional using an answer file which contains predefined settings and answers to the questions that are asked during Setup. If necessary, an answer file can be customised to support specific hardware configurations and to contain instructions for running various programs and applications. Thus administrators can automate and customise a Windows XP Professional installation to include:

- The operating system.
- Hardware device drivers.
- Service Packs for Windows XP Professional.
- Applications such as Microsoft Office.

The information contained within an answer file or script will vary to suit individual circumstances. Typically, a script might include acceptance of the licensing agreement, the computer name and the type of network adapter used. While there is nothing to stop administrators from creating answer files manually using a text editor such as Notepad, by far the simplest option is to use the Setup Manager



Figure 4 - The Check Upgrade Only mode highlights potential problems.

deployment tool (Figure 5). This wizard is enormously useful to system administrators. For example, it can create new answer files or it can extract information from a preconfigured system and turn it into an answer file, which can be used to replicate that configuration on other machines.

Moreover, if the wizard is launched at the console of a server where the distribution files are to be located, it can also create a distribution point for network installations. This network installation share can contain drivers, additional commands, applications, and other custom components.

To install Setup Manager, find the DEPLOY.CAB file in the \Support\Tools folder of the Windows XP Professional CD. Copy the SETUPMGR.EXE and SETUPMGX.DLL files to the same directory of the machine's hard disk and then, from the command prompt, change the current directory to the directory containing the copied files. Type SETUPMGR to launch Setup Manager, and begin creating answer files with the wizard.

Later, running WINNT32 /unattend[num]:[answer\_file] will perform a fresh installation of Windows XP Professional in unattended Setup mode. Note that "num" is the number of seconds between the time that Setup finishes copying the files before restarting the computer, and "answer\_file" is the name of the automated script. To perform an unattended upgrade to Windows XP Professional, system administrators would run WINNT32 /unattend at the command prompt on a computer running Windows 9x, Me, NT, 2000, or XP. The "unattend" command line option transfers all user settings from the previous installation, with no user intervention required during Setup.

### Disk Cloning

Disk cloning is also known as disk-image copying, or ghost imaging. The idea behind disk cloning is to configure a master desktop machine that is capable of meeting the needs of an organisation, and then to duplicate it to hundreds of other desktops. But while disk cloning might be the fastest way to deploy Windows XP Professional on a number of computers, it is certainly the most complex because it involves dealing with many possible hardware configurations. There is also the operating system's Security ID (SID) to consider.

Every Windows XP, Windows 2000 and Windows NT computer has a unique SID buried within the Registry. This SID forms the foundation for secure communications with other computers that share the same operating systems. Obviously this could cause a security problem when multiple machines are cloned. If, say, 50 computers are cloned with the same SID and the computers are then placed in a workgroup, it is a simple matter to gain unauthorised access. Microsoft's System Preparation tool (SYSPREP.EXE) gets round this issue by assigning a unique SID to each target computer the first time the machine is rebooted.

SysPrep is not the complete answer to disk cloning; rather it prepares a master computer for cloning. In other words, SysPrep allows system administrators to take a snapshot of a configured workstation and then transfer that image to multiple workstations using a third-party tool such as Norton Ghost from Symantec ([www.symantec.com](http://www.symantec.com)). To use SysPrep successfully, the mass storage controllers (IDE or SCSI) between the master and destination computers must be identical. It also helps if all computers concerned are flashed with identical BIOS versions. Plug and Play devices such as network cards and sound cards do not have to be the same, although drivers for these devices should be available.

### Mini Setup

SysPrep can also be used to automate a mini-setup of Windows XP Professional. This is a shortened GUI-mode setup that takes under 10 minutes to complete instead of 45 to 60 minutes, which is the norm. To perform a mini-setup, system administrators install the operating system first and then pre-configure the shell and applications to the degree required. When the end-user starts the computer for the first time, SysPrep enables the mini-setup tool to prompt the user for the remaining information required to finish setting up the computer. This information is mostly user-specific and typically includes items such as the End User License Agreement, Product ID, plus user name and company details. The tool can manually restore the

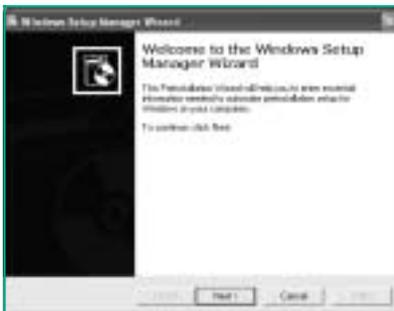


Figure 5 - The Setup Manager deployment tool.

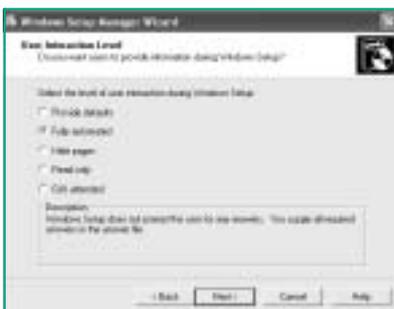


Figure 6 - Selecting the level of user interaction during Setup.

computer to an end-user ready state, or it can automate the process using distribution folders and answer files. SysPrep is available from the same Setup Manager mentioned earlier.

### **Boot Server**

Remote Installation Services (RIS) is a scripted installation service. RIS was introduced with Windows 2000 and requires Active Directory. It allows Windows XP Professional to be installed “clean” from any current version of Windows Server (except Windows 2000 Datacenter Server), on supported computers throughout the organisation. RIS can also be used to repair an existing installation, and provides basic disaster recover capabilities that even non-technical staff can exploit.

Once enabled, RIS turns the computer into a boot server that can respond to client requests for boot images. Note that the server needs a separate disk partition for RIS, and a recommended 2 GB of free space. RIS works with clients that support Pre-Boot eXecution Environment (PXE) architecture, although some non-compliant systems can emulate a PXE client using a special boot disk. The boot server assigns the PXE client two TCP/IP addresses from DHCP. One address is for itself and the other is assigned for the boot server, with the client using the Trivial File Transfer Protocol (TFTP) to download the boot image. For computers that do not contain a PXE-based remote boot ROM, RIS includes a tool called Remote Boot Floppy Generator (RBFGE.EXE) to create a remote boot disk for use with RIS. The RIS remote boot disk can be used with a variety of supported PCI-based network adapters.

Using the Setup Manager wizard described earlier, administrators can select the level of user interaction during Setup (Figure 6). For example, the downloaded RIS image might require input from the user, such as a computer name or an administrator password. Alternatively, the installation can be completely automated. Overall, there are few disadvantages to using RIS and quite a few positives. Be aware, however, that RIS will only work with images that have been created from the C: drive. It will not use images of other partitions on a hard disk. Note also that RIS can only be used to perform clean installations of an operating system. It is not for upgrades.

### **Finally**

There can be little doubt that Windows XP Professional offers a compelling upgrade over existing Windows NT and 9x clients. But for those organisations that have recently moved to Windows 2000, it is hard to find a convincing reason to upgrade to Windows XP - at least, in the short term. While Windows XP is better than Windows 2000 in certain areas, many organisations will regard it as little more than a minor upgrade.

Then there are the many organisations that find themselves right in the middle of a Windows 2000 migration. Should they simply carry on with the rollout regardless? The answer will depend largely on the requirements of the organisation and indeed the capabilities of its support staff. If, for example, administrators do not mind coping with the extra responsibility involved in working with more than one operating system, then completing the rollout with Windows XP Professional should cause few problems. After all, desktops that are Windows 2000 ready should stand a very good chance of being Windows XP ready too.

#### **Further Information**

List of supported hardware  
[www.microsoft.com/hcl](http://www.microsoft.com/hcl)

System Management Server home page  
[www.microsoft.com/smsgmt/default.asp](http://www.microsoft.com/smsgmt/default.asp)

Search for hardware and software which is compatible with Windows XP.  
[go.microsoft.com/fwlink/?LinkID=453](http://go.microsoft.com/fwlink/?LinkID=453)

Tool for checking whether machines are Windows XP ready  
[www.tallysys.com/products/tscensus/quickcensus/quickcensus.html](http://www.tallysys.com/products/tscensus/quickcensus/quickcensus.html)

Comprehensive operating system migration tool  
[www.tallysys.com/products/tscensus/index.html](http://www.tallysys.com/products/tscensus/index.html)

Disk cloning utility  
[www.symantec.com/ghost](http://www.symantec.com/ghost)

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